

Tourtellotte Memorial High School Mary Fisher Elementary School Roof Replacement Project

Town of Thompson
Thompson, CT

May 2020

DAS Project No. 141-0022 RR

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

<u>Terry Bellman</u> Local Building Official's Name	<u>Terry Bellman</u> Signature	<u>5-26-2020</u> Date
<u>James S. Smith Jr</u> Local Fire Marshal's Name	<u>James S. Smith Jr</u> Signature	<u>5/27/2020</u> Date
<u>Sherry McClean, R.S.</u> Local Health Official's Name	<u>Sherry McClean</u> Signature	<u>5/28/20</u> Date
<u>Terry Bellman</u> Local Federal 504 Official's Name	<u>Terry Bellman</u> Signature	<u>5/26/2020</u> Date

Tighe & Bond

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Local Federal 504 Official's Name

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**Tourtellotte Memorial High School/Mary Fisher Elementary School
Roof Replacement Project
Thompson Public Schools
Thompson, Connecticut**

Table of Contents

<u>Section</u>	<u>Title</u>	<u>Number of Pages</u>
Division 0 – Bidding and Contract Requirements		
00 11 13	Advertisement for Bids	1
00 21 13	Instructions to Bidders	11
00 41 13	Form for General Bid	5
00 43 13	Bid Bond	2
00 52 00	Agreement	7
00 61 13.13	Performance Bond	3
00 61 13.16	Payment Bond	3
00 72 00	General Conditions	72
00 73 00	Supplementary Conditions	10
	Attachments	
	A. Connecticut State Wage Rates	4
	B. Limited Asbestos Bulk Sampling Report	4
Division 1 – General Requirements		
01 11 00	Summary of Work	3
01 14 00	Work Restrictions	2
01 23 00	Alternates	2
01 29 73	Schedule of Values	1
01 29 76	Progress Payment Procedures	5
01 31 00	Project Management and Coordination	3
01 32 33	Photographic Documentation	1
01 32 13	Scheduling of Work	3
01 33 00	Submittal Procedures	11
01 35 29	Health and Safety Plan	4
01 56 00	Temporary Barriers and Enclosures	2
01 60 00	Product Requirements	3
01 71 33	Protection of Adjacent Construction	3
01 76 00	Protecting Installed Construction	1
01 77 00	Closeout Procedures	4
Division 2 – Existing Conditions		
02 41 13	Selective Demolition	8
02 41 19	Selective Demolition for Electrical System	2
02 82 13	Asbestos Roofing Abatement	17

**Tourtellotte Memorial High School/Mary Fisher Elementary School
Roof Replacement Project
Thompson Public Schools
Thompson, Connecticut
Table of Contents**

<u>Section</u>	<u>Title</u>	<u>Number of Pages</u>
Division 4 – Masonry		
04 01 20	Maintenance of Unit Masonry	4
Division 5 – Finishes		
05 05 00	Welding	7
05 30 00	Metal Decking	6
Division 6 – Wood, Plastics, and Composites		
06 10 00	Rough Carpentry	8
Division 7 – Thermal and Moisture Protection		
07 22 00	Roof and Deck Insulation	9
07 53 00	EPDM Sheet Roofing	14
07 59 50	Preparation for Re-Roofing	6
07 62 00	Sheet Metal Flashing and Trim	6
07 72 00	Roof Accessories	4
07 72 33	Roof Hatches	5
07 92 00	Joint Sealants	7
Division 8 – Openings		
08 51 13	Aluminum Windows	12
08 80 00	Glazing	11
Division 9 – Finishes		
09 90 00	Painting and Coating	10
Division 22 – Plumbing		
22 13 16	Sanitary Waste and Vent Piping	5
Division 23 – Heating, Ventilating, and Air Conditioning		
23 05 00	Common Work Results for HVAC	2
Division 26 – Electrical		
26 05 00	Common Work Results for Electrical	4

THOMPSON PUBLIC SCHOOLS

THOMPSON, CONNECTICUT

ADVERTISEMENT FOR BIDS

Sealed Bids for the construction of the “Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project” will be received at the First Selectman’s Office, Thompson Town Hall, 815 Riverside Drive, North Grosvenordale, CT 06255 until 3:00 p.m. local time on October 19, 2020. Faxed and e-mailed bids will not be accepted. Submissions received after the deadline will not be considered. Bids must contain all required information. Sealed Bids must have outer envelope marked as “Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project”. Bids will be publicly opened and read at the October 20, 2020 meeting of the Board of Selectmen at 7:00 pm at the Thompson Town Hall, in the Merrill Seney Community Room.

The work consists of the removal and disposal of existing roofing, including but not limited to ballast, membrane, insulation, flashing; and the installation of new EPDM roofing system, including but not limited to insulation, coverboard, blocking, and vapor barrier.

Bidding Documents may be obtained electronically from the Tighe & Bond website at: http://www.tighebond.com/Projects_Out_to_Bid.php

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

The Town of Thompson reserves the right to reject any and all proposals, or any part thereof, and to waive any informality in the process to serve the best interests of the Town of Thompson. The Town reserves the right either before or after the opening of proposals, to ask any proposer to clarify its proposal or to submit additional information that the Town, in its sole discretion, deems desirable.

Prices must be firm for a period of one hundred and twenty (120) days following the bid opening. Bid withdrawal may be made only with the consent of the Town of Thompson.

This project is partially funded by a grant from the Connecticut State Department of Education. Section 00 73 00 contains the funding program construction contract requirements, all of which shall be applicable to this Contract. Bidders are required to be prequalified pursuant to Connecticut General Statute Section 4a-100.

A voluntary pre-Bid conference will be held at the site located at 785 Riverside Rd, North Grosvenor, CT on Monday September 28, 2020 at 3:30 pm. This is not a mandatory pre-bid conference, but all prospective bidders are encouraged to attend.

TOWN OF THOMPSON, CONNECTICUT

Consulting Engineer:

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

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

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

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 NOT include account numbers, account amounts, or lines of credit.
- 3.3 Any bid, from a Bidder who is on a U.S. Government and/or State of Connecticut Debarred Contractor List, will be rejected by the Owner in accordance with State and Federal Laws and Regulations.

3.4 The successful bidder will be required to perform background checks for all persons expected to work on-site.

3.5 Bidders must be prequalified in accordance with Connecticut General Statute Section 4a-100.

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.

4.5 Other Work at the Site

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

ARTICLE 5 BIDDER'S REPRESENTATIONS

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

- A. examine and carefully study the Bidding Documents, including any Addenda, data, and referenced items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, or performance of the Work;

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

ARTICLE 6 PRE-BID CONFERENCE

- 6.1 A pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the meaning or intent of the Bidding Documents shall be submitted in writing to the Engineer via the Tighe & Bond website for bidding document distribution at:

http://www.tighebond.com/Projects_Out_to_Bid.php

- 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 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.
- 7.4 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, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.3 All Bid deposits of General Bidders, except those under consideration by Owner, will be returned within 5 days, excluding Saturdays, Sundays and legal holidays, after the opening of General Bids. Other Bid deposits will be returned upon the execution and delivery of the Agreement. The Bid deposit of the Successful Bidder will be retained until such bidder has furnished the required contract security and executed the Agreement, whereupon the bid deposit shall be returned. If the Successful Bidder fails to furnish the required contract security within 15 days after the Notice of Award and execute the Agreement within 5 days after receipt from Owner, Owner may annul the Notice of Award and the Bid deposit of that Bidder will be forfeited to Owner as liquidated damages for such failure.

ARTICLE 9 CONTRACT TIMES

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

ARTICLE 10 LIQUIDATED DAMAGES

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

ARTICLE 11 SUBSTITUTE AND “OR EQUAL” ITEMS

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

equal” item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the effective date of the Contract.

ARTICLE 12 PREPARATION OF BID

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

ARTICLE 13 BASIS OF BID

13.1 Lump Sum

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

13.2 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. 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.

13.3 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 14 SUBMITTAL OF BID

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

ARTICLE 15 MODIFICATION OR WITHDRAWAL OF BID

15.1 Withdrawal Prior to Bid Opening

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

15.2 Modification Prior to Bid Opening

- A. If a Bidder wishes to modify its Bid prior to the Bid opening, Bidder must withdraw its initial Bid in the manner specified in paragraph 16.1.A and submit a new Bid prior to the date and time for the opening of Bids.

15.3 Withdrawal After Bid Opening

- A. If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and demonstrates to the reasonable satisfaction of Owner within said time that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned.

ARTICLE 16 OPENING OF BIDS

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

- 16.2 In order to be considered for selection, Bids must arrive at the designated location on or before the date and time specified in the Advertisement for Bids. Bidders mailing their Bids should allow for normal mail delivery time to ensure timely receipt of their Bids by Owner.
- 16.3 Bids received by mail or otherwise after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.
- 16.4 No responsibility will attach to Owner, its employees or the Engineer for premature opening of a Bid not properly addressed and identified in accordance with the Bidding Documents.

ARTICLE 17 DISQUALIFICATION OF BIDDERS

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

ARTICLE 18 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19 EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities, and the right to disregard all nonconforming, nonresponsive or conditional Bids.
- 19.2 Owner reserves the right to reject any Bid not accompanied by specified documentation and Bid deposit.
- 19.3 Owner reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.
- 19.4 Owner reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.
- 19.5 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.6 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.
- 19.7 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.
- 19.8 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.
- 19.9 If the lowest responsible and qualified Bidder's price submitted is in excess of funds available to make an award, the Owner reserves the right to negotiate with such bidder and award the contract on the basis of the funds available, without change in the Contract, Specifications,

Drawings and other requirements. If the award of the Contract on such basis is refused by such Bidder, the Owner reserves the right to negotiate with other Bidders in ascending order of Bid prices without change in the Contract, Specifications, Drawings and other requirements.

19.10 Contents of the Bid of the Successful Bidder will become part of any contract awarded.

ARTICLE 20 CONTRACT SECURITIES

20.1 Performance and payment bonds shall be furnished by the successful Bidder. The amounts of and other requirements for performance and payment bonds are stated in Article 6 of the General Conditions. Performance and payment bonds submitted shall be posted by a recognized surety company having a place of business in the State of Connecticut. All performance and payment bonds signed by an agent must be accompanied by a certified copy of the authority to act. Performance Bonds and Payment Bonds shall be submitted on the forms included in Sections 00 61 13.13 and 00 61 13.16, respectively, of the Contract Documents. Additional requirements may be stated in the General or Supplementary Conditions.

20.2 Within 15 days from the date of the Notice of Award, the Successful Bidder shall deliver to Owner and Engineer, for review and approval, the performance bond and the payment bond he proposes to furnish at the time of the execution of the Agreement.

20.3 The required contract securities will become part of the Contract Documents.

ARTICLE 21 CONTRACT INSURANCE

21.1 The requirements for insurance to be provided by the Successful Bidder are stated in Article 6 of the General Conditions and in the Supplementary Conditions.

21.2 Within 15 days from the date of the Notice of Award, the Successful Bidder shall deliver evidence of required insurance to Owner and Engineer.

21.3 The required insurance certificates will become part of the Contract Documents.

ARTICLE 22 SIGNING OF AGREEMENT

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

ARTICLE 23 SALES TAXES

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

ARTICLE 24 CONNECTICUT PREVAILING WAGE RATES

24.1 Minimum Wage Rates as determined by the Connecticut State Labor Commissioner as required under [Section 22a-482-4(p)(3) of the CWF regulations] [Section 31-53(g) of the Connecticut General Statutes] as amended, apply to this project unless the total Bid is less than \$400,000 for new construction or \$100,000 for remodeling, refinishing, refurbishing, rehabilitation, alteration or repair projects. The Wage Rate Determination is included in Part II of the Supplementary Conditions.

- 24.2 It is the responsibility of the Bidder before bid opening to request any additional information on Minimum Wage Rates for those tradespeople who may be employed for the proposed Work under this Contract.

ARTICLE 25 SBE/MBE PARTICIPATION REQUIREMENTS

- 25.1 The Contractor awarded this contract shall comply with the provisions of CT General Statute Section 4a-60g regarding set asides for small contractors and minority business enterprises and the requirements concerning nondiscrimination and affirmative action under Sections 4a-60 and 4a-60a. The Contractor shall, on the basis of competitive bidding procedures, (A) set aside at least twenty-five per cent of the total value of the contract to subcontractors who are small contractors, and (B) of that portion to be set aside in accordance with subparagraph (A) of this subdivision, reserve a portion equivalent to twenty-five per cent of the total value of the contract or portion thereof to be set aside for awards to subcontractors who are minority business enterprises. The Contractor must demonstrate a good faith effort to meet the 25% set aside goals.

END OF SECTION

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SECTION 00 41 13

FORM FOR GENERAL BID

PROJECT IDENTIFICATION:

Tourtellotte Memorial High School/Mary Fisher Elementary School
Roof Replacement 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:

Thompson Public Schools
815 Riverside Drive
North Grosvenordale, CT 06255

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

ARTICLE 2 - BIDDER’S ACKNOWLEDGEMENTS

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

ARTICLE 3 - BIDDER’S REPRESENTATIONS

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

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

ARTICLE 4 - BIDDER'S CERTIFICATION

- 4.1 Bidder certifies that, under penalty of perjury, Bidder is not presently debarred from doing public construction work in the State of Connecticut under the provisions of Section 31-53a of the Connecticut General Statutes or any other applicable debarment provisions of any other chapter of the General Statutes or any rule or regulation promulgated thereunder; and is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

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

ARTICLE 5 - BASIS OF BID

5.1 Bidder proposes to furnish all labor and materials required for construction of the Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project in accordance with the accompanying Bidding Documents prepared by Tighe & Bond, Inc., for the Contract Price specified below, subject to additions and deductions according to the terms of the Bidding Documents.

5.2 This Bid includes Addenda numbered _____.

5.3 The proposed Contract Price (including unit price items 1A, 1B, and 1C) is:

_____ dollars

(words)

(\$ _____)

(figures)

Alternate No. 1, Add \$ _____; Deduct \$ _____

5.4 The unit price bid items values are as follows:

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
1A	Additional Wood Blocking (beyond base bid work), per board foot, the price of: _____) (\$ _____)	x 2000 b.f. =	\$ _____
1B	Additional brick masonry replacement (beyond base bid work), per square foot, the price of: _____) (\$ _____)	x 200 s.f. =	\$ _____
1C	Additional re-pointing of mortar joints, per linear foot, the price of: _____) (\$ _____)	x 200 l.f. =	\$ _____

Tourtallotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

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. Department of Administrative Services Prequalification Certificate
- F. Department of Administrative Services Update (Bid) Statement

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

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BID BOND

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

BIDDER (*Name and Address*):

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

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND

Bond Number:

Date:

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

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

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

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

SECTION 00 52 00

AGREEMENT

This Agreement is by and between the Thompson Public Schools, as requested by its Board of Selectmen hereinafter called Owner and _____ hereinafter called Contractor.

Owner and Contractor hereby agree as follows:

ARTICLE 1 WORK

1.1 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described with the following title: "Town of Thompson, Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project"

ARTICLE 2 ENGINEER

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

ARTICLE 3 CONTRACT TIMES

3.1 Time of the Essence

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

3.2 Substantial Completion and Final Payment

A. The Work will be substantially completed by August 13, 2021 and completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions by August 28, 2021.

3.3 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 3.1 above and that Owner will suffer financial and other losses if the Work is not completed within the times specified in Paragraph 3.2 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

- 1. Substantial Completion: Contractor shall pay Owner \$ 1,000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 3.1 above for Substantial Completion until the Work is substantially complete.
- 2. Completion of Remaining Work: if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract), for completion and readiness for final payment,

Contractor shall pay Owner \$ 1,000 for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 4 CONTRACT PRICE

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

ARTICLE 5 PAYMENT PROCEDURES

- 5.1 Applications for Payment shall be processed in accordance with Article 15 of the General Conditions.
- 5.2 Owner shall make progress payments on account of the Contract Price on the basis of processed Applications for Payment monthly during construction, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All progress payments will be measured by the Schedule of Values established as provided in the General Conditions, or in the event there is no schedule of values, as provided elsewhere in the Contract.
- 5.3 Owner shall retain from progress payments 5 percent of the value of Work completed.
- 5.4 Final Payment
 - A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 6 CONTRACTOR’S REPRESENTATIONS

- 6.1 Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
 - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
 - E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-

related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 7 CONTRACT DOCUMENTS

7.1 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 00 52 00-1 to 00 52 00-7, 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. Specifications (Divisions 1 through 9);
 - 6. Drawings (not attached but incorporated by reference) consisting of a cover sheet and sheets numbered G-001 through G-003, D-101 through D-105, A-101 through A-116, inclusive, with each sheet bearing the following general title: Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project;
 - 7. Addenda (numbers ____ to ____, inclusive);
 - 8. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 00 41 13-1 to 00 41 13-5, inclusive);
 - b. Certified copy of Resolution of Board of Directors (if Corporation);
 - 9. 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 The agreed upon direct labor markup (percentage) for Change Orders on this project shall be 10% percent in accordance with Paragraph 13.01.B.1 of the General Conditions.

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

OWNER:

CONTRACTOR:

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest _____

Attest _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

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

License No. _____
(Where applicable)

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

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

Certified as to the availability of funds:

Date

Signed

Title

END OF SECTION

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PERFORMANCE BOND

CONTRACTOR *(name and address):*

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

OWNER *(name and address):*

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal *(seal)*

Surety's Name and Corporate Seal *(seal)*

By: _____
Signature

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

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

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, 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 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 the project in compliance 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 a 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

SURETY

 Contractor's Name and Corporate Seal

 Surety's Name and Corporate Seal

By: _____
 Signature

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

 Print Name

 Print Name

 Title

 Title

Attest: _____
 Signature

Attest: _____
 Signature

 Title

 Title

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

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

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

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

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

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

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

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

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

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

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

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

18. Modifications to this Bond are as follows:

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
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 Site17

Article 6 – Bonds and Insurance19

6.01 Performance, Payment, and Other Bonds19

6.02 Insurance—General Provisions.....19

6.03 Contractor’s Insurance.....20

6.04 Owner’s Liability Insurance.....23

6.05 Property Insurance23

6.06 Waiver of Rights.....25

6.07 Receipt and Application of Property Insurance Proceeds.....25

Article 7 – Contractor’s Responsibilities26

7.01 Supervision and Superintendence26

7.02 Labor; Working Hours26

7.03 Services, Materials, and Equipment.....26

7.04 “Or Equals”27

7.05 Substitutes28

7.06 Concerning Subcontractors, Suppliers, and Others29

7.07 Patent Fees and Royalties31

7.08 Permits.....31

7.09 Taxes32

7.10 Laws and Regulations.....32

7.11 Record Documents.....32

7.12 Safety and Protection32

7.13 Safety Representative33

7.14 Hazard Communication Programs33

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 Services37

Article 8 – Other Work at the Site38

8.01 Other Work38

8.02 Coordination39

8.03 Legal Relationships39

Article 9 – Owner’s Responsibilities40

 9.01 Communications to Contractor40

 9.02 Replacement of Engineer40

 9.03 Furnish Data.....40

 9.04 Pay When Due40

 9.05 Lands and Easements; Reports, Tests, and Drawings40

 9.06 Insurance40

 9.07 Change Orders40

 9.08 Inspections, Tests, and Approvals.....41

 9.09 Limitations on Owner’s Responsibilities41

 9.10 Undisclosed Hazardous Environmental Condition.....41

 9.11 Evidence of Financial Arrangements.....41

 9.12 Safety Programs41

Article 10 – Engineer’s Status During Construction41

 10.01 Owner’s Representative41

 10.02 Visits to Site41

 10.03 Project Representative42

 10.04 Rejecting Defective Work42

 10.05 Shop Drawings, Change Orders and Payments.....42

 10.06 Determinations for Unit Price Work42

 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 Documents43

 11.02 Owner-Authorized Changes in the Work44

 11.03 Unauthorized Changes in the Work.....44

 11.04 Change of Contract Price44

 11.05 Change of Contract Times.....45

 11.06 Change Proposals.....45

 11.07 Execution of Change Orders46

 11.08 Notification to Surety.....47

Article 12 – Claims47

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 Work52

14.01 Access to Work52

14.02 Tests, Inspections, and Approvals.....52

14.03 Defective Work53

14.04 Acceptance of Defective Work53

14.05 Uncovering Work53

14.06 Owner May Stop the Work54

14.07 Owner May Correct Defective Work.....54

Article 15 – Payments to Contractor; Set-Offs; Completion; Correction Period55

15.01 Progress Payments.....55

15.02 Contractor’s Warranty of Title.....58

15.03 Substantial Completion.....58

15.04 Partial Use or Occupancy59

15.05 Final Inspection59

15.06 Final Payment59

15.07 Waiver of Claims61

15.08 Correction Period.....61

Article 16 – Suspension of Work and Termination62

16.01 Owner May Suspend Work62

16.02 Owner May Terminate for Cause.....62

16.03 Owner May Terminate For Convenience63

16.04 Contractor May Stop Work or Terminate63

Article 17 – Final Resolution of Disputes64

17.01 Methods and Procedures.....64

Article 18 – Miscellaneous.....64

18.01 Giving Notice.....64

18.02 Computation of Times64

18.03 Cumulative Remedies64

18.04 Limitation of Damages65
18.05 No Waiver65
18.06 Survival of Obligations65
18.07 Controlling Law65
18.08 Headings65

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

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

1.02 *Terminology*

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

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

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

2.02 Copies of Documents

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

2.03 Before Starting Construction

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

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

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

2.05 *Initial Acceptance of Schedules*

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

2.06 *Electronic Transmittals*

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

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

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

3.02 *Reference Standards*

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

3.03 *Reporting and Resolving Discrepancies*

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

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

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

B. *Resolving Discrepancies:*

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

3.04 *Requirements of the Contract Documents*

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

3.05 *Reuse of Documents*

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.04 *Progress Schedule*

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

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. abnormal weather conditions;
3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

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

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

5.01 *Availability of Lands*

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

5.02 *Use of Site and Other Areas*

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

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

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

5.03 *Subsurface and Physical Conditions*

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

5.04 *Differing Subsurface or Physical Conditions*

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

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

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

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

5.05 *Underground Facilities*

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

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

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

5.06 *Hazardous Environmental Conditions at Site*

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

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

ARTICLE 6 – BONDS AND INSURANCE

6.01 Performance, Payment, and Other Bonds

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

6.02 Insurance—General Provisions

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

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

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

6.03 *Contractor's Insurance*

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

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

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

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

6.04 *Owner's Liability Insurance*

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

6.05 *Property Insurance*

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

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

6.06 *Waiver of Rights*

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

6.07 *Receipt and Application of Property Insurance Proceeds*

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

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

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

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

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

7.02 *Labor; Working Hours*

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

7.03 *Services, Materials, and Equipment*

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

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

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

7.04 *“Or Equals”*

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

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

7.05 *Substitutes*

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

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.
- 7.06 *Concerning Subcontractors, Suppliers, and Others*
- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

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

O. Nothing in the Contract Documents:

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

7.07 *Patent Fees and Royalties*

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

7.08 *Permits*

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

7.09 *Taxes*

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

7.10 *Laws and Regulations*

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

7.11 *Record Documents*

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

7.12 *Safety and Protection*

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

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

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

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

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

7.15 *Emergencies*

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

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

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

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

1. *Shop Drawings:*

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

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

2. *Samples:*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
 1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

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

E. *Resubmittal Procedures:*

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

7.17 *Contractor's General Warranty and Guarantee*

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

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

7.18 *Indemnification*

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

7.19 *Delegation of Professional Design Services*

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

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

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

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

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

8.02 *Coordination*

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

8.03 *Legal Relationships*

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

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

ARTICLE 9 – OWNER’S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

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

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner’s Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

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

9.12 *Safety Programs*

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

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

10.01 *Owner’s Representative*

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

10.02 *Visits to Site*

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

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

10.03 *Project Representative*

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

10.04 *Rejecting Defective Work*

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

10.05 *Shop Drawings, Change Orders and Payments*

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

10.06 *Determinations for Unit Price Work*

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

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

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

10.08 *Limitations on Engineer's Authority and Responsibilities*

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

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

10.09 Compliance with Safety Program

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

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

11.01 Amending and Supplementing Contract Documents

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

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

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

11.02 *Owner-Authorized Changes in the Work*

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

11.03 *Unauthorized Changes in the Work*

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

11.04 *Change of Contract Price*

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

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

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

11.05 *Change of Contract Times*

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

11.06 *Change Proposals*

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

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

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

11.07 Execution of Change Orders

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

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

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

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

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

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

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

13.01 *Cost of the Work*

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

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

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

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

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:
- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.
- E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

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

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

13.03 *Unit Price Work*

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

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

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

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

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

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

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

14.03 *Defective Work*

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

14.04 *Acceptance of Defective Work*

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

14.05 *Uncovering Work*

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

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

14.06 *Owner May Stop the Work*

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

14.07 *Owner May Correct Defective Work*

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

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

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

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

15.01 Progress Payments

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

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

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

D. *Payment Becomes Due:*

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

E. *Reductions in Payment by Owner:*

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

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

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

15.02 *Contractor's Warranty of Title*

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

15.03 *Substantial Completion*

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

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

15.04 *Partial Use or Occupancy*

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

15.05 *Final Inspection*

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

15.06 *Final Payment*

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

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

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Application and Acceptance:*
1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

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

15.07 *Waiver of Claims*

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

15.08 *Correction Period*

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

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

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

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

16.02 *Owner May Terminate for Cause*

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

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

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

16.03 *Owner May Terminate For Convenience*

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

16.04 *Contractor May Stop Work or Terminate*

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

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

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

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

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

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

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

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

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Headings*

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

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

PART 1 - AMENDMENTS TO GENERAL CONDITIONS

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

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

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

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

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

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

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02 Delete paragraph 2.02A in its entirety.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

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

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

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

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

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

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

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

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

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

5.03E.1 None

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

SC-5.06 Delete Paragraphs 5.06A and 5.06B in their entirety and insert the following:

5.06A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to the Owner.

5.06B. Not used.

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:

Employer's Liability:

Bodily injury, each accident	<u>Statutory</u>
Bodily injury by disease, each employee	<u>Statutory</u>
Bodily injury/disease aggregate	<u>Statutory</u>

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

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

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

Bodily Injury:

Each person	<u>\$1,000,000</u>
Each accident	<u>\$1,000,000</u>

Property Damage:

Each accident	<u>\$1,000,000</u>
---------------	--------------------

[or]

Combined Single Limit of	<u>\$2,000,000</u>
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4. Excess or Umbrella Liability:

Per Occurrence	<u>\$2,000,000</u>
General Aggregate	<u>\$2,000,000</u>

5. Contractor's Pollution Liability:

Each Occurrence	<u>\$2,000,000</u>
General Aggregate	<u>\$2,000,000</u>

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

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

Town of Thompson, CT

815 Riverside Drive
North Grosvenordale, CT 06255

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

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 \$2,000,000 _____ Each Occurrence
\$2,000,000 _____ Aggregate

Property Damage \$2,000,000 _____ Each Occurrence
\$2,000,000 _____ 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, Inc, (53 Southampton Rd, Westfield, MA 01085)

ARTICLE 7 - CONTRACTOR’S RESPONSIBILITIES

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

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

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

7.07B Not used.

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

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

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

USED

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

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

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

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

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor’s work.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

- 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
- 7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
- 8. Authorize Owner to occupy the Project in whole or in part.

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

SC-11.04 Delete paragraph 11.04C.2.c in its entirety and insert the following in its place:

11.04C.2.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 paragraph 12.01C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01A.1 and 11.01A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the Cost of the Work, not including any Subcontractor’s fee; provided, however, that for any such work the maximum total fee to be paid by Owner shall be no greater than 20 percent.

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

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

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

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

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

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

For the situation where equipment is on the job and available for use but cannot be used due to a delay or suspension of a portion or all of the Contract activities, a rental standby rate may be paid if the Contractor can conclusively demonstrate to the satisfaction of the Engineer that: (1) the equipment cannot be used elsewhere on the Project or demobilized and remobilized at a cost lower than the cost of standby time, (2) that the equipment cannot be put in use due to factors beyond the Contractor's control, and (3) the equipment on standby would have been used as part of the Work that is suspended or put on hold. The standby rate will be calculated as no more than 50% of the rental rate as listed in the "Bluebook" and adjusted for regional and age adjustments. Lesser standby rates may apply if the Owner or Engineer can demonstrate that the Contractor's standby cost is less than this rate. The standby rate will not include operating costs. A standby rate will not be paid for equipment which is being employed for portions of the Work which are still underway. A standby rate will also not be paid for equipment which is readily demobilized including construction equipment categorized as "shop tools" or "miscellaneous" in the "Bluebook." Standby rates for durations of less than four hours will not be considered.

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

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

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

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

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

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

SC-15.03 Delete the word “preliminary” from paragraph 15.03D.

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

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

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

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

D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, or other

time period in accordance with applicable laws and regulations, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer’s recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

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

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

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.02 Add the following paragraph after paragraph 17.01:

17.02 Venue
A. Any suit by either party arising under this Contract shall be brought only in the Superior Court in the county where the Project is located. The parties hereto waive any argument that this venue is improper or that the forum is inconvenient.

ARTICLE 18 - MISCELLANEOUS

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

18.09 Wage Rates
A. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of these Contract Documents. Copies of the wage schedules are included in Part II of these Supplementary Conditions. If it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials 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. 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.
- D. 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.

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.

END OF SECTION

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ATTACHMENTS TO SUPPLEMENTARY CONDITIONS

**ATTACHMENT A
CONNECTICUT STATE WAGE RATES**



DEPARTMENT OF ADMINISTRATIVE SERVICES (DAS)
Office of School Construction Grants & Review (OSCG&R)

CURRENT PREVAILING WAGE RATES

FORM SCG-6000

**IN COMPLIANCE WITH SECTION 31-53 OF THE
CONNECTICUT GENERAL STATUTES (C.G.S.)**

SHALL BE INSERTED

**PRIOR TO RELEASE OF DOCUMENTS
For BID or PROCUREMENT**

ANNUAL ADJUSTMENT OF WAGE RATES

WILL BE AS REQUIRED

PER C.G.S. SECTION 31-55a

If you have questions regarding wages and workplace standards refer to the Department of Labor website: <http://www.ctdol.state.ct.us> or call 860-263-6000

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Windham	Sterling	15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	\$38.90	39.46
Windham	Sterling	16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	\$44.63	32.95
Windham	Sterling	-----TRUCK DRIVERS-----		
Windham	Sterling	17a) 2 Axle	\$29.86	25.79 + a
Windham	Sterling	17b) 3 Axle, 2 Axle Ready Mix	\$29.97	25.79 + a
Windham	Sterling	17c) 3 Axle Ready Mix	\$30.03	25.79 + a
Windham	Sterling	17d) 4 Axle, Heavy Duty Trailer up to 40 tons	\$30.08	25.79 + a
Windham	Sterling	17e) 4 Axle Ready Mix	\$30.13	25.79 + a
Windham	Sterling	17f) Heavy Duty Trailer (40 Tons and Over)	\$30.35	25.79 + a
Windham	Sterling	17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	\$30.13	25.79 + a
Windham	Sterling	18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	\$45.92	26.08 + a
Windham	Sterling	19) Theatrical Stage Journeyman	\$25.76	7.34
Windham	Thompson	1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 7**		
Windham	Thompson	1c) Asbestos Worker/Heat and Frost Insulator	\$40.21	30.99
Windham	Thompson	2) Boilermaker	\$38.34	26.01
Windham	Thompson	3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	\$35.71	33.31 + a
Windham	Thompson	3b) Tile Setter	\$34.90	25.87
Windham	Thompson	3c) Terrazzo Mechanics and Marble Setters	\$31.69	22.35

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Windham	Thompson	3d) Tile, Marble & Terrazzo Finishers	\$26.70	21.75
Windham	Thompson	3e) Plasterer	\$33.48	32.06
Windham	Thompson	-----LABORERS-----		
Windham	Thompson	4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	\$31.00	22.15
Windham	Thompson	4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	\$31.25	22.15
Windham	Thompson	4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	\$31.50	22.15
Windham	Thompson	4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is \$26.80.	\$32.00	22.15
Windham	Thompson	4d) Group 5: Air track operator, sand blaster and hydraulic drills.	\$31.75	22.15
Windham	Thompson	4e) Group 6: Blasters, nuclear and toxic waste removal.	\$34.00	22.15
Windham	Thompson	4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	\$32.00	22.15
Windham	Thompson	4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	\$29.28	22.15
Windham	Thompson	4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	\$28.74	22.15
Windham	Thompson	4i) Group 10: Traffic Control Signalman	\$18.00	22.15
Windham	Thompson	5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	\$34.53	25.64
Windham	Thompson	5a) Millwrights	\$34.94	26.19
Windham	Thompson	6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	\$40.25	29.17+3% of gross wage
Windham	Thompson	7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	\$55.12	34.765+a+b

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Windham	Thompson	----LINE CONSTRUCTION----		
Windham	Thompson	Groundman	\$26.50	6.5% + 9.00
Windham	Thompson	Linemen/Cable Splicer	\$48.19	6.5% + 22.00
Windham	Thompson	8) Glazier (Trade License required: FG-1,2)	\$39.18	22.55 + a
Windham	Thompson	9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	\$36.67	37.62 + a
Windham	Thompson	----OPERATORS----		
Windham	Thompson	Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	\$42.45	25.30 + a
Windham	Thompson	Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	\$42.11	25.30 + a
Windham	Thompson	Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	\$41.32	25.30 + a
Windham	Thompson	Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	\$40.91	25.30 + a
Windham	Thompson	Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	\$40.28	25.30 + a
Windham	Thompson	Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	\$40.28	25.30 + a
Windham	Thompson	Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	\$39.95	25.30 + a
Windham	Thompson	Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	\$39.59	25.30 + a
Windham	Thompson	Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.;	\$39.17	25.30 + a

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
		transfer machine.		
Windham	Thompson	Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).	\$38.71	25.30 + a
Windham	Thompson	Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	\$36.54	25.30 + a
Windham	Thompson	Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	\$36.54	25.30 + a
Windham	Thompson	Group 12: Wellpoint operator.	\$36.48	25.30 + a
Windham	Thompson	Group 13: Compressor battery operator.	\$35.86	25.30 + a
Windham	Thompson	Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	\$34.66	25.30 + a
Windham	Thompson	Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	\$34.23	25.30 + a
Windham	Thompson	Group 16: Maintenance Engineer/Oiler.	\$33.54	25.30 + a
Windham	Thompson	Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	\$38.11	25.30 + a
Windham	Thompson	Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	\$35.53	25.30 + a
Windham	Thompson	-----PAINTERS (Including Drywall Finishing)-----		
Windham	Thompson	10a) Brush and Roller	\$35.62	22.55
Windham	Thompson	10b) Taping Only/Drywall Finishing	\$36.37	22.55
Windham	Thompson	10c) Paperhanger and Red Label	\$36.12	22.55
Windham	Thompson	10e) Blast and Spray	\$38.62	22.55
Windham	Thompson	11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	\$44.63	32.95
Windham	Thompson	12) Well Digger, Pile Testing Machine	\$37.26	24.05 + a
Windham	Thompson	13) Roofer (composition)	\$38.40	21.35
Windham	Thompson	14) Roofer (slate & tile)	\$38.90	21.35

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Windham	Thompson	15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	\$38.90	39.46
Windham	Thompson	16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	\$44.63	32.95
Windham	Thompson	-----TRUCK DRIVERS-----		
Windham	Thompson	17a) 2 Axle	\$29.86	25.79 + a
Windham	Thompson	17b) 3 Axle, 2 Axle Ready Mix	\$29.97	25.79 + a
Windham	Thompson	17c) 3 Axle Ready Mix	\$30.03	25.79 + a
Windham	Thompson	17d) 4 Axle, Heavy Duty Trailer up to 40 tons	\$30.08	25.79 + a
Windham	Thompson	17e) 4 Axle Ready Mix	\$30.13	25.79 + a
Windham	Thompson	17f) Heavy Duty Trailer (40 Tons and Over)	\$30.35	25.79 + a
Windham	Thompson	17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	\$30.13	25.79 + a
Windham	Thompson	18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	\$45.92	26.08 + a
Windham	Thompson	19) Theatrical Stage Journeyman	\$25.76	7.34
Windham	Willimantic	1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 7**		
Windham	Willimantic	1c) Asbestos Worker/Heat and Frost Insulator	\$40.21	30.99
Windham	Willimantic	2) Boilermaker	\$38.34	26.01
Windham	Willimantic	3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	\$35.71	33.31 + a
Windham	Willimantic	3b) Tile Setter	\$34.90	25.87
Windham	Willimantic	3c) Terrazzo Mechanics and Marble Setters	\$31.69	22.35

As of: July 1, 2020

Important Information:

For use with Building, Heavy/Highway, and Residential

Welders: Rate for craft to which welding is incidental.

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

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

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

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

Crane with boom including jib, 150 feet - \$1.50 extra.

Crane with boom including jib, 200 feet - \$2.50 extra.

Crane with boom including jib, 250 feet - \$5.00 extra.

Crane with boom including jib, 300 feet - \$7.00 extra.

Crane with boom including jib, 400 feet - \$10.00 extra.

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

- Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of one apprentice in a specific trade.

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

- The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.
- Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.
- The annual adjustments will be posted on the Department of Labor's Web page: www.ctdol.state.ct.us.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.
- All subsequent annual adjustments will be posted on our Web Site for contractor access.

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

- All Persons who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.
- All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)
- Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

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

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

**Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES**

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

- a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

SECTION 01 11 00

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:

Tourtellotte Memorial High School/Mary Fisher Elementary School
Roof Replacement Project
Board of Selectmen
Town of Thompson
May 2020

Tighe & Bond, Inc.
Consulting Engineers
Westfield, Massachusetts

2. The Work includes the following major items:
 - a. Temporary removal of rooftop equipment as necessary to facilitate roof replacement and curb repair/re-flashing.
 - b. Removal and disposal of roof systems shown on the Drawings, including ballast, EPDM membrane, coverboard, insulation, blocking, cants, fascia, and edge metal.
 - c. Removal and disposal of existing roof drains, edge metal, access hatches, and ladders.
 - d. Removal of existing windows.
 - e. Installation of new rigid insulation over the entire area of roof replacement, as needed to increase the total R-value of insulation to a minimum of 25. In areas of tapered insulation, an average R-value of 25 is required.
 - f. Installation of new blocking as necessary to match new top of insulation elevation at roof edges, to ensure that all curbs extend a minimum of 12 inches above the surface of the new roof, and elsewhere as shown on the drawings.
 - g. Installation of new roof drains, edge metal, access hatches, and ladders.
 - h. Installation of a new single-ply EPDM roof membrane system with all required flashings and ½" coverboard.
 - i. Installation of new fiberglass reinforced gypsum sheathing and a base sheet.
 - j. Installation of new windows.

- k. New masonry and re-pointing.
- l. Tree removal.
- m. Asbestos and hazardous materials abatement.
- n. Full-time superintendence of the project by a construction supervisor licensed in the State of Connecticut.

B. Related Requirements

- 1. Section 00 73 00 - Supplementary Conditions

1.2 SUBMITTALS

A. Informational Submittals

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

1.3 EXISTING SYSTEM DESCRIPTION

- A. The existing roof systems to be replaced are divided into multiple sections of varying sizes. Existing EPDM roof sections consist of EPDM membrane over ½” coverboard and rigid insulation on a metal deck. Existing ballasted roof sections consist of stone ballast and filter fabric with an underlying EPDM membrane over ½” coverboard and rigid insulation on a cementitious wood-fiber deck, concrete deck, or metal deck.

1.4 PROJECT/SITE CONDITIONS

A. Permits

- 1. Obtain the permits and approvals listed below:
 - a. Permits and licenses of a temporary nature necessary to perform the Work.
 - b. Permits for disposal of construction wastes.
 - c. Other permits or licenses required for the Contractor’s operations or required elsewhere in the Contract Documents and not included herein.
- 2. Obtain required time extensions to permits obtained by the Contractor, if construction authorized by permits has not been completed by the expiration date noted on these permits.
- 3. Obtain permits and approvals from appropriate jurisdictional agencies and property owners for use of premises not furnished by the Owner, and for all off-site areas.
- 4. Submit copies of permits prior to performance of Work authorized by permits.

B. Existing Conditions

- 1. Use of Premises and Off-site Work
 - a. The Work shall occur on the Owner’s property within the limits of Work shown on the Drawings.

- b. Land owned by the Owner may be made available for staging.
- c. Obtain permits and approvals for use of any land and access thereto that is deemed necessary for the Work, where such land is not available for use by the Owner, including land for temporary construction facilities, access and egress, or for storage of materials. Confine apparatus and storage to such additional areas.
- d. Obtain permits and written approvals from appropriate jurisdictional agencies for the use of premises not available for use by the Owner, including all offsite staging areas and waste areas. Submit copies of all permits and approvals to the Owner prior to using areas.
- e. Provide for the disposal of waste materials off-site in accordance with all applicable laws.
- f. Adhere to the limits of Work as indicated, to minimize obstruction to traffic and inconvenience to the Owner, general public, and residents in the vicinity of the Work, and to protect people and property. Keep fire hydrants on or adjacent to the Work accessible to firefighting equipment at all times.
- g. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.
- h. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.

PART 2 PRODUCTS

2.1 MATERIALS FURNISHED BY OWNER

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

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 14 00

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Work Schedule
 - 2. Construction Constraints
 - 3. Available Work Area
 - 4. Site Usage Plan
- B. Related Requirements
 - 1. Section 01 31 00 – Project Management and Coordination
 - 2. Section 01 32 13 – Scheduling of Work

1.2 SUBMITTALS

- A. Incorporate the requirements of this Section in the project schedule submitted under Section 01 32 13.
- B. Action Submittals
 - 1. Submit site usage plan within 30 days of the Notice to Proceed.
 - 2. Submit project schedule with major project milestones and sequence of work for review and approval no later than November 12, 2020.
 - 3. Submit Schedule of Values for review and approval no later than November 12, 2020 as specified in Section 01 29 73.

1.3 WORK SCHEDULE

- A. **When School is not in session**, conduct Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 3:30 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above without prior approval by the Owner. Building will be occupied during the project. Work to be conducted outside the work days and hours described above must be approved by the Owner with a minimum of 48 hour notice. No equipment or machinery may be started at the sites before 7:00 a.m. and all equipment must be shut off by 3:30 p.m. The normal work week shall be no more than 40 hours without the Owner's prior approval.
- B. **When School is in session**, conduct Work during "after school hours" on Monday through Friday, and within the time between 3:30 p.m. and 11:30 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above without prior approval by the Owner. Work to be conducted outside the work days and hours described above must be approved by the Owner with a minimum of 48 hour notice. The normal work week shall be no more than 40 hours without the Owner's prior approval.

- C. The Contractor may request to work other than the work hours specified in 1.3.A. and 1.3.B. However, approval to work other than normal hours is at the sole discretion of the Owner. If allowed, the Contractor shall be responsible for reimbursing the Owner for any expenses resulting from working outside of hours noted in 1.3.A and 1.3.B, including payment for additional janitorial staff (\$50/hour), Clerk of the Works (\$110/hour), and hazardous materials abatement monitoring (\$110/hour).
- D. The Thompson Public Schools Academic School Calendar for the 2020-2021 school year is provided at the end of this section for reference.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CONSTRUCTION CONSTRAINTS

- A. The following are constraints for the Work. Incorporate these constraints into the schedule required to be submitted under Section 01 32 13.
 - 1. All components of the existing facility must remain in operation throughout construction of the new facility unless otherwise specified herein or in Section 01 31 00.
 - 2. All Contractor personnel and subcontractors that will be working on school grounds shall complete CORI check prior to commencement of work.
 - 3. Project will be awarded on or about November 5, 2020
 - 4. Period for submittals, review, and approval will be from November 6, 2020 – December 8, 2020.
 - 5. Materials required for the project must be fabricated and ready for construction by April 25, 2021.
 - 6. Mobilization and non-disruptive work may begin on May 16, 2021.
 - 7. Disruptive construction shall begin on first day after the close of the school year. The anticipated last day of school will be June 8, 2021 (Pending Snow days).
 - 8. The project must be substantially complete on or before August 13, 2021
 - 9. Allowable staging and storage areas must be cleared no later than August 21, 2021.
 - 10. The project must reach final completion by August 28, 2021.
 - 11. In order to help with expediting the work, the school will allow the Contractor to mobilize for field measurements, investigations, and non-disruptive work during the following scheduled breaks and recesses:
 - a. Thanksgiving - November 25-27, 2020
 - b. Holiday Recess -December 24, 2020 – January 1, 2021
 - c. February Break – February 15-16, 2021
 - d. Spring Recess – April 19-23, 2021
 - 12. Additional school access may be available if school schedule changes and building is unoccupied.

3.2 AVAILABLE WORK AREA

- A. Limits of construction are defined on the Drawings. No work will be permitted to be performed outside these boundaries.
- B. Allowed staging areas, locations of temporary fencing, and construction trailer locations are depicted on Figure 1. (attached).

3.3 SITE USAGE PLAN

- A. Submit a site usage plan no later than 30 days after award showing all proposed staging areas, locations of all office and storage trailers, and material laydown areas. The site usage plan should be a drawing showing the proposed locations and shall include on-site traffic modifications and temporary utilities as may be applicable.

END OF SECTION

Thompson Public Schools

785 Riverside Drive
North Grosvenordale, CT 06255
www.district.thompsonk12.org

Superintendent's Office 860-923-9581
Tourtellotte Memorial High School 860-923-9303
Thompson Middle School 860-923-9380
Mary R. Fisher Elementary School 860-923-9142



2019-2020 CALENDAR

- Full Professional Development Days - August 27th, February 19th, April 9th
- Half-Day Professional Development - September 11th, November 13th, ~~December 11th~~, January 15th, March 11th, April 8th
- Half-Days for Ed-Reflect – October 9th, February 12th, May 13th
- **Teachers Meeting – August 26th**
- **Professional Development – August 27th**
- **FIRST DAY OF SCHOOL - August 28th**
- Labor Day – September 2nd
- Columbus Day - October 14th
- Veterans' Day - November 11th
- Thanksgiving Recess - November 27th – 29th
- Holiday Recess - December 23rd - January 1st
- Christmas Day - December 25th
- New Year's Day - January 1st
- M.L. King's Birthday Observed - January 20th
- President's Day - February 17th
- February Break - February 17th - 18th
- Good Friday - April 10th
- Spring Recess - April 13th - 17th
- Memorial Day Observance - May 25th
- Scheduled Last Day - June 17th

Parent/Teacher Conferences:
MRFES – 11/13, 11/14, 3/11, 3/12
(early release for students)
TMS – 11/6, 3/4 (early release for students)
11/7, 3/5 (full days for students)
TMHS – 10/3, 3/5 (full days for students)

Ending Quarters: 10/29, 1/14, 3/25, 4/4

TMHS Exams (early release for students):
Mid-Year 1/15-17, 1/21
Final 6/5, 6/8, 6/9, 6/10

No school/delay opening:

11/1/19 – power outage, no school
12/3/19 – snow storm, no school
12/11/19 – snow storm, no school
12/17/19 – snow storm, no school
12/18/19 – 2 hour delay

This calendar represents a core 181-day schedule. School cancellations will be added to the scheduled last day on this calendar beginning June 12, 2020. The Board reserves the right to make any changes to this calendar.

Holidays/Vacations Prof. Development - No School for Students

Board of Education Meetings Early Release Days

August 2019						
Su	M	Tu	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	TM	27	28	29	30	31

September 2019						
Su	M	Tu	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October 2019						
Su	M	Tu	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November 2019						
Su	M	Tu	W	Th	F	S
					X	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December 2019						
Su	M	Tu	W	Th	F	S
1	2	X	4	5	6	7
8	9	10	X	12	13	14
15	16	X	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

January 2020						
Su	M	Tu	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

February 2020						
Su	M	Tu	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

March 2020						
Su	M	Tu	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

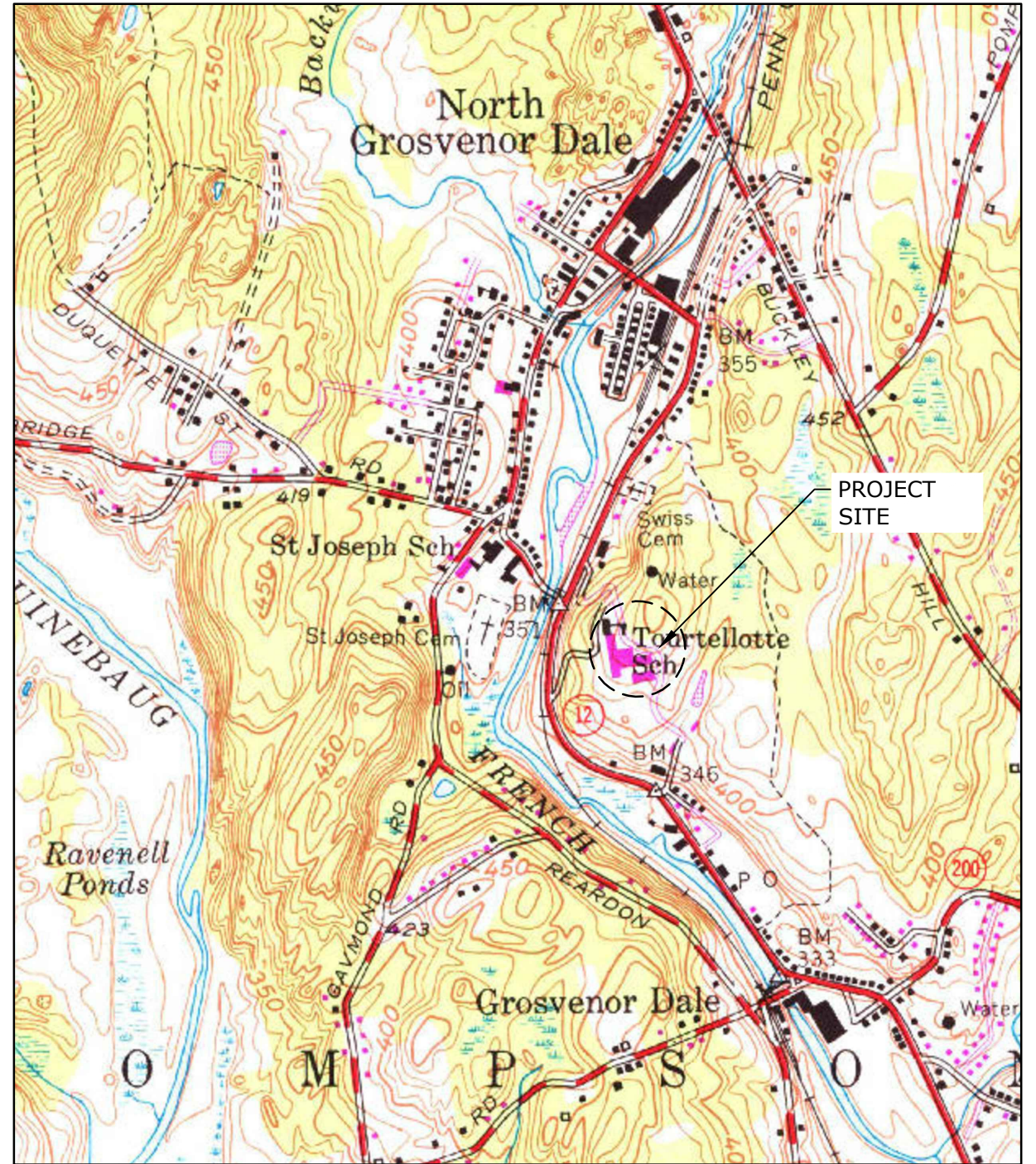
April 2020						
Su	M	Tu	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May 2020						
Su	M	Tu	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June 2020						
Su	M	Tu	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Calendar Template © calendarlabs.com

Calendar Approved: February 11, 2019 Updated: 12/19/2019



THOMPSON PUBLIC SCHOOL
ROOF REPLACEMENT PROJECT

CONSTRUCTION TRAILER AND
ALLOWABLE STAGING AREAS

DATE:	5/6/2020
SCALE:	NO SCALE
FIGURE	01



SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Alternate No. 1 – Coverboard
- B. Related Requirements
 - 1. Section 01 63 00 – Product Substitution During Construction
 - 2. Section 07 22 00 – Roof and Deck Insulation
 - 3. Section 07 72 00 – Roof Accessories

1.2 DEFINITIONS

- A. Alternate: An amount proposed by Bidder and stated on the bid form for certain work defined in this section 01 23 00 that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change in the scope of construction to be completed either in quantity or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Price to incorporate the Alternate into the Work. No other adjustments are made to the Contract Price.

1.3 PROCEDURES

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

1.4 ALTERNATES

- A. Alternate No. 1 – Coverboard
 - 1. General
 - a. Alternate includes the installation of cover board beneath the EDPM roofing membrane at all locations to receive EDPM roofing membrane. Coverboard shall be adhered to the substrate and installed per the requirements of Section 07 22 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

SECTION 01 25 00

SUBSTITUTION PROCEDURES

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 Designer if it complies with the provisions of the General Conditions. 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 the General Conditions.
- 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 Designer’s sole discretion, a product proposed by the Contractor does not qualify as an “or-equal” item under the provisions of the General Conditions, it can be considered a proposed substitute item. Submit information required under the General Conditions for proposed substitutes.
- B. The Designer 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 the General Conditions, include the following in each substitution request:
 - 1. For products or Suppliers:
 - a. Product identification, including Supplier & manufacturer's name and address.

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

- 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 Designer 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 the General Conditions.
- 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 01 29 73

SCHEDULE OF VALUES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Schedule of Values

1.2 SUBMITTALS

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

1.3 SCHEDULE OF VALUES

- A. Schedule of Values shall be a detailed breakdown of the lump sum Work items showing values allocated to the various elements of the Work.
- B. The format of the Schedule of Values shall be a breakdown by Specification Section and content and shall be submitted on EJCDC C-620, Contractor's Application for Payment. The Engineer may require additional detailed documentation to support the values in the form of executed purchase orders, subcontracts, or other agreements.
- C. The Engineer will determine the level of breakdown and detail required. The breakdown shall include materials, installation, and start-up for equipment and controls where applicable. The final document will be the basis of payment requests for the duration of the Contract. No progress payment will be made until the Schedule of Values is approved by the Engineer.
- D. An unbalanced Schedule of Values providing overpayment on items of work performed first will not be accepted.
- E. At the Contractor's option, items for mobilization and demobilization may be included in the Schedule of Values. The combined value shall not exceed 5 percent of the Contract Price, and the values for mobilization and demobilization shall be equal. Payment for mobilization will be included in the first payment request after the Contractor has initiated full-time construction activity. Payment for demobilization will be included in the first payment request after Substantial Completion has been reached and all equipment has been removed from the Site.
- F. At the Contractor's option, an item for bonds and insurance may be included in the Schedule of Values. If included, requests for payment including values for bonds and insurance shall be accompanied by matching invoices.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01 29 76

PROGRESS PAYMENT PROCEDURES**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 01 29 73 - Schedule of Values

1.2 GENERAL

- A. The following paragraphs describe payment procedures for the work to be done under the respective items in the Bid Form.
- B. Each lump sum and unit price will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor's overhead and profit for each separately identified item.
- C. Except as provided for in Section 01 29 73, no separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the Contract Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.
- D. Division 2 through Division 26 Work will be measured and paid for at the Contractor's unit Bid price or 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 constitute full compensation for all labor, equipment and materials necessary and required to complete the work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.
- B. Item 1 - Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project

1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of each work item listed in the Schedule of Values provided under Section 01 29 73 estimated by the Contractor and approved by the Designer.
2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the construction of the Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement Project, in its entirety as detailed in the Contract Documents.

1.4 UNIT PRICE ITEMS

- A. Each unit price stated in the Bid form (or Sub-Bid form) shall constitute full compensation for all labor, equipment and materials necessary and required to complete the Work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents.
- B. Payment of the unit price items will only be made for the actual quantity of Work performed in accordance with the Contract Documents.
- C. Item 1A – Additional Wood Blocking (Beyond base bid work)
 1. Measurement
 - a. Measurement for additional wood blocking will be on a board foot basis as measured in the field by the Engineer. Item 1A “Additional wood blocking” is for unforeseen wood blocking that may be required during construction, including additional edge blocking required due to increased insulation height. The base bid work includes the base amount and locations of wood blocking as identified on the contract documents.
 2. Payment
 - a. Payment of the bid price for additional wood blocking will be full compensation for all removal and proper off-site disposal of the existing wood blocking, installing new wood blocking, and all labor, equipment, and materials required for or incidental to the work.
- D. Item 1B – Additional brick masonry replacement (beyond base bid work)
 1. Measurement
 - a. Measurement for additional brick masonry replacement will be on a square foot basis as measured in the field by the Engineer. Item 1B “Additional brick masonry replacement” is for unforeseen brick masonry replacement that may be encountered during demolition/construction. The base bid work includes the base amount

and locations of brick masonry replacement as identified on the contract documents.

2. Payment

- a. Payment of the bid price for additional brick masonry replacement will be full compensation for all removal and proper off-site disposal of the existing brick masonry and mortar, and all labor, equipment, and materials required for or incidental to the work.

E. Item 1C – Additional re-pointing of mortar joints

1. Measurement

- a. Measurement for additional re-pointing of mortar joints will be on a linear foot basis as measured in the field by the Engineer. Item 2B “Additional re-pointing of mortar joints” is for unforeseen repointing that may be encountered during demolition/construction. The base bid work includes the base amount and locations of re-pointing of mortar joints as identified on the contract documents.

2. Payment

- a. Payment of the bid price for additional re-pointing of mortar joints will be full compensation for all removal and proper off-site disposal of the existing damaged mortar joints, furnishing and installing new mortar joints, and all labor, equipment, and materials required for or incidental to the work.

1.5 PAYMENT PROCEDURES

A. Informal submittal: Unless otherwise directed by the Engineer:

1. Make an informal submittal of request for payment by filling in, with erasable pencil, pertinent portions of EJCDC C-620, Contractor’s Application for Payment, plus continuation sheet or sheets, or submitting an electronic copy to the Engineer for review.
2. Make this preliminary submittal to the Engineer at the at the end of each month or designated billing period.
3. Revise the preliminary submittal as approved by the Engineer and incorporate the approved payments into the formal submittal.

B. Formal submittal: Unless otherwise directed by the Engineer:

1. Make formal submittal of request for payment by filling in the agreed data, by typewriter or electronically on EJCDC C-620, Contractor’s Application for Payment, plus continuation sheet or sheets.
2. Sign and notarize the Application for Payment.
3. Submit the original of the Application for Payment, plus six identical copies of the continuation sheet or sheets, to the Engineer.

4. The Engineer will compare the formal submittal with the approved informal submittal and, if acceptable, will sign the Contractor's Application for Payment, and present the Application to the Owner.
5. Provide a signed and notarized Certificate for Stored Materials and proof of storage in a dry, watertight, heated and insured warehouse facility.

1.6 PAYMENT REQUESTS FOR STORED MATERIALS

- A. Requests for payment for stored materials shall be made in accordance with Section 00 72 00 and shall be accompanied by the attached "Certificate for Stored Materials" form. Payment for stored materials shall not exceed the value actually paid by the Contractor for the stored materials as evidenced by the accompanying bill of sale, invoice, or other documentation.
- B. Partial payment requests for materials stored or so-called "engineering costs" by equipment manufacturers will not be allowed. All such costs shall be distributed proportionately among the various items of equipment/hardware to be furnished.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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CERTIFICATE FOR STORED MATERIALS

Tighe & Bond Project No.

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

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

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

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

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

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

Contractor's Firm Name

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

By _____

Title _____

Notary Public

SCHEDULE OF STORED MATERIALS

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

Date _____
 Pay Estimate _____

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

Signature: _____
 Contractor's Principal

Total Amount Due for Stored Materials _____

Title: _____

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Project Management
 - 2. Coordination
 - 3. Project Meetings
- B. Related Requirements
 - 1. Section 01 14 00 - Work Restrictions
 - 2. Section 01 32 13 - Scheduling of Work
- 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 01 32 13.
- B. Informational Submittals
 - 1. Submit to the affected utility company, the Owner, and the Engineer, in writing, all requests for temporary shutdowns of facilities or interruption of operations. No shutdowns of existing utilities or interruptions to existing operations will be permitted except as outlined in this Section. Submit requests at least 2 weeks prior to the beginning of the Work requiring shutdown or interruption. No shutdown shall occur without the approval of the utility company or the Owner.
 - 2. At the pre-construction conference, supply to the Owner the cell phone number of a responsible person who may be contacted during off-hours for emergencies 24 hours a day, seven days a week.
 - 3. Prepare a contact list of phone numbers, including cell phone numbers, and emails for all Project personnel and submit to the Engineer at the pre-construction conference. Include Contractor, Owner, Engineer, and City of Thompson personnel including police, fire, and ambulance.
 - 4. Résumé for superintendents shall be submitted and approved by the Owner's Project Manager and Designer.

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 connections to the existing utilities.
- C. Coordinate with appropriate utility companies, as well as with the Owner, where the Work crosses or is adjacent to existing utilities.
- D. Coordinate as necessary with the Owner's Commissioning Agent.
- E. Contractor is required to schedule and coordinate all third party testing, and commissioning testing.

1.5 PROJECT MEETINGS

- A. Pre-Construction Conference
 - 1. The Contractor shall be prepared to discuss the following subjects at the Pre-Construction Conference. Documentation for these items is required to be submitted within the time frames included in individual specification sections.
 - a. Project scheduling
 - b. Sequencing of critical path Work items
 - c. Shop Drawing procedures
 - d. Project changes and clarification procedures
 - e. Use of sites, access to Work areas, office and storage areas, security and temporary facilities
 - f. Contractor safety plan and representative
 - g. Progress payments and procedures
 - h. Required documentation
 - i. Project personnel contact list
- B. Progress Meetings
 - 1. Progress meetings will be held as requested by the Owner and Engineer and at other times 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 01 32 13.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 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 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. Timing and duration of on-site construction activities.
 2. Access of workers to the School Building.
- E. The Owner has the authority to order the Work stopped which could unreasonably result in stopping the necessary functions of the necessary functions of the Thompson Public Schools. Any costs and/or delays associated with these work stoppages due to the Contractor's operation shall be borne by the Contractor.

3.2 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 01 32 13.

END OF SECTION

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SECTION 01 32 13

SCHEDULING OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Progress Schedule

B. Related Requirements

1. Section 01 14 00 - Work Restrictions

2. Section 01 31 00 – Project Management and Coordination

1.2 REFERENCES

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

1.3 MILESTONES

A. Milestone No. 1: Submit site usage plan within 30 days of the Notice to Proceed.

B. Milestone No. 2: The Contractor shall reach substantial completion by August 16, 2020.

C. Milestone No. 3: The contractor shall reach final completion by September 13, 2020.

1.4 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
- 11. Milestone completion dates
- 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 01 31 00, Project Management and Coordination.
- F. The Progress Schedule shall reflect Work restrictions outlined in Section 01 14 00.
- G. Show information in such detail that duration times of activities will range from one to 15 days. The selection and number of activities shall be subject to the approval of the Owner and Engineer.
- H. The Progress Schedule should show preceding and following event numbers for each activity, description of each activity, and activity duration in calendar days.
- I. Submit the Progress Schedule on maximum sheet size 30-inches high by the width required.

1.5 SUBMITTALS

- A. Informational Submittals
 - 1. Submit four prints of the preliminary Progress Schedule prepared in accordance with Article 2.05 of Section 00 72 00 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 – As requested by the Owner and the Engineer.
 - 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.

1.6 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

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SECTION 01 32 33

CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

1.2 SUBMITTALS

A. Informational Submittals

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

PART 2 PRODUCTS

2.1 CONSTRUCTION PHOTOGRAPHS

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

PART 3 EXECUTION

3.1 PRE-CONSTRUCTION PHOTOGRAPHY

- A. Prior to the commencement of any Work under this Contract, take photographs of all components of existing building systems to be upgraded and the project site that will be affected by construction. 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 at 1-week intervals of active work areas throughout the life of the Contract. The photographs shall be indicative of the work that is currently in progress. A total of 3 photographs shall be taken at each scheduled interval at each location where Work is in progress.

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

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SECTION 01 33 00

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. Detailed installation drawings (sewers, equipment, piping, electrical conduits and controls, HVAC work, and plumbing, etc.) shall be drawn to scale and fully dimensioned.
 8. No material or equipment shall be purchased or fabricated until the required Shop Drawings have been submitted and approved. Materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by the Shop Drawings.
 9. Until the necessary approval has been given, do not proceed with any portion of the work, the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.
 10. If submitted equipment requires modifications to the structures, piping, layout, or other details shown on the Drawings, details of the proposed modifications must also be submitted for approval. If such equipment and modifications are approved, perform all Work necessary to make such modifications at no additional cost to the Owner.
- B. Product Data: Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.
- C. 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 01 25 00.
- E. Operation and Maintenance Manuals: In accordance with Section 01 77 00.
- F. Schedule of Values: In accordance with Section 01 29 73.
- G. Site Usage Plan: In accordance with Section 01 14 00.

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 00 72 00.
- 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 01 29 76, Progress Payment Procedures.

2. Submit schedule of stored materials when requesting payment for materials not yet installed.
- G. Construction Photography: Provide preconstruction, progress, and post-construction photography in accordance with Section 01 32 33.
- H. Contract Closeout Submittals: In accordance with Section 01 77 00.
- 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 01 32 13.
- 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. 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. 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.
- W. 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 00 72 00. 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 00 72 00.
- K. Distribution
- 1. Distribute approved Shop Drawings and approved product data to the Project Site and elsewhere as required to communicate the information to Suppliers, Subcontractors, and field personnel.
- 1.6 ENGINEER'S REVIEW
- A. The Engineer will review submittals for design, general methods of construction and detailing. The Engineer's review and approval of submittals shall not be construed as a complete check nor does it relieve the Contractor from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Engineer's attention to such deviations at the time of submission. It will not extend to means, methods, technique, sequences, or procedures of construction (except where specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.
 - B. The Engineer's review of the submittals shall not relieve the Contractor from the responsibility for proper fitting of the Work, or the responsibility of furnishing any work required by the Contract Documents which may not be indicated on the submittals. The Contractor shall be solely responsible for any quantities shown on the submittals.
 - C. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall provide written notice to the Engineer at least 7 working days prior to release for manufacture.
 - D. When the submittals have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

- E. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:
1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.
 2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.
 3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.
 4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.
- F. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:
1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.
 2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SUBMITTAL CERTIFICATION FORM

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

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

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

- NO DEVIATIONS
- A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

SUBMITTED BY: _____ DATE: _____

GENERAL CONTRACTOR'S STAMP

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

P.E. CERTIFICATION FORM

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

_____ to design
(Name of Contractor)

(Insert P.E. Responsibilities)

In accordance with Specification Section _____ for the

(Name of Project)

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

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

(Insert Name of Owner)

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

P.E. Name

Contractor's Name

Signature

Signature

Title

Title

Address

Address

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

SECTION 01 35 29

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

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

1.2 REFERENCES

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

1.3 DEFINITIONS

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

1.4 SUBMITTALS

A. Informational Submittals

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

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

1.5 CONTRACTOR'S RESPONSIBILITIES

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

1.6 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The following items shall be addressed in the HASP:
 - 1. safety and health hazard assessment;
 - 2. procedures for emergency medical treatment and first aid;
 - 3. map indicating route to hospital for emergency medical care;
 - 4. Lead Exposure Control Plan (29 CFR 1926.62);

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

1.7 CONTINGENCY MEASURES & NOTIFICATIONS

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

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

PART 2 PRODUCTS

2.1 AIR MONITORING EQUIPMENT

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

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 56 00

TEMPORARY BARRIERS AND ENCLOSURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Taking all precautions, providing all programs, and taking all actions necessary to protect the Work, site, and all public and private property and facilities from damage.
2. Security and Facility Protection
3. Temporary Fencing System

1.2 SUBMITTALS

A. Informational Submittals

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

1.3 PROTECTION OF SITE FACILITIES

- A. Protect areas of work from dirt and damage during entire construction period.
- B. Protect areas away from work during entire construction period.
- C. Protect building areas under construction during entire replacement process with weather tight barriers. Secure openings to protect areas while under replacement and until construction is complete.
- D. Each contractor is responsible for securing their own work and work areas.

1.4 PROTECTION OF INSTALLED PRODUCTS

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion.
- B. Control traffic and movement of equipment for construction to prevent damage to site features, equipment, materials and surfaces.
- C. Provide coverings to building components and materials from damage.

1.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Fire Extinguisher - Provide hand-carried, portable, UL rated, class "ABC" dry chemical extinguishers. Locate fire extinguishers where effective for the intended purpose and as required by regulations

1. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking hazardous fire exposure areas.
 2. Store combustible materials in containers in fire-safe locations.
 3. Provide supervision of welding operations, combustion type temporary heating units, and sources of fire ignition.
- B. Barricades, Warning Signs and Lights - Comply with standard and code requirements for erection of barricades. Paint appropriate warning signs to inform personnel and the public of the hazard being protected against. Where needed, provide temporary fencing, barricades, warning lines, barriers, as required to segregate the construction areas from existing facilities, occupants and the public. Also, where needed, provide lighting, including flashing lights.
- C. Security Enclosure and Lockup - Install temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism and theft. Where materials and equipment must be stored, provide a secure lockup. The Owner is not responsible for Contractor's losses due to damage or theft by vandals.
- D. Dust control – The Contractor shall erect and maintain poly dust barriers along the interior of the building no further than 5 ft. from the work area using “zip wall” or approved equal.

1.6 TERMINATION AND REMOVAL

- A. Remove each facility when the need has ended, or replaced by a permanent facility, or no later than Substantial Completion. Complete or restore at no additional cost to the owner all areas damaged as a result of facility. Repair damaged work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
- B. Temporary facilities are property of the Contractor.

1.7 TEMPORARY FENCING SYSTEM

- A. Comply with the requirements the local and/or regional permit required to be obtained as part of this regulation, for temporary fencing.
- B. Provide temporary fencing system limiting public access to the proposed work and storage areas. Fencing system shall be installed such that the fence system will adequately secure the site where applicable.
- C. The location of the temporary fencing system is to be determined by the location of the work and shall be shown on the site usage plan.
- D. Remove the temporary fencing system after the completion of the Work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 FENCE INSTALLATION

A. Install fence according to manufacturer’s recommendations.

END OF SECTION

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SECTION 01 60 00

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

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SECTION 01 71 33

PROTECTION OF ADJACENT CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Protection of roofs, walls, floors, entries, exits, doors, windows, and other related building features.
2. Protection and replacement of items and surfaces exterior of the building, including trees, shrubs, signs, property markers, fences, roots, sidewalks, pavement, landscaping, and related project features.
3. 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 necessary as approved by the Engineer. Items to be removed shall be clearly marked as directed by the Engineer. If objects not to be removed are damaged or removed, they shall be repaired or replaced to their original condition.

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

where the Work is located at the Contractor's expense. Should any monuments or markers be destroyed through accident, neglect or as a result of the Work under this Contract, the Contractor shall, at his own expense, employ a land surveyor licensed in the State where the Work is located to re-establish the monument or marker.

3.2 PROTECTION

A. Underground and Surface Structures

1. Sustain in their places and protect from direct or indirect injury underground and surface structures within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.
2. Pay utility service company charges related to the temporary support of utility poles if required to complete the Work.
3. Assume risks associated with the presence of underground and surface structures within or adjacent to the limits of the Work. The Contractor shall be responsible for damage and expense for direct or indirect injury caused by his Work to any structure. Immediately repair damage caused by the Work to the satisfaction of the owner of the damaged structure.

END OF SECTION

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SECTION 01 76 00

PROTECTING INSTALLED CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage.
- B. Related Sections
 - 1. Section 01 32 33 – Photographic Documentation
 - 2. Section 01 56 00 – Temporary Barriers and Enclosures
 - 3. Section 02 41 13 – Selective Site Demolition
 - 4. Section 02 41 19 – Selective Building Demolition
 - 5. Section 07 59 50 – Preparation for Re-Roofing

1.2 PROTECTION OF FLOORS AND ROOFS

- A. Protect roof from overloads, dirt, and damage during the entire construction period. In areas subject to foot traffic, secure heavy fiberboard covering in place to protect roof from traffic and dropped items. For storage of products, lay tight wood sheathing in place.
- B. Proper Protective covering shall be used when moving heavy equipment and handling materials or other loads. Install recommended protection and remove on completion of that activity. Restrict use of adjacent unprotected areas.

1.3 PROTECTION OF INSTALLED PRODUCTS

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion.
- B. Control traffic to prevent damage to equipment, materials, and surfaces.
- C. Provide coverings to protect equipment and materials from damage.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01 77 00

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

1.3 SUBSTANTIAL COMPLETION

- A. Refer to Article 15.03 in 00 72 00, General Conditions, for procedures relating to obtaining Substantial Completion. Refer to 00 52 00, 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.
 - 1. Locate all utilities and appurtenances concealed in construction. Provide detail not shown on Contract Documents. Use colored pencils or felt tipped pens to record all revisions to the as-built drawings. Use the following color code unless otherwise approved by the Engineer:
 - a. Process and Mechanical: Red
 - b. Architectural: Blue
 - c. Structural: Purple
 - d. Plumbing: Brown
 - e. HVAC: Green
 - f. Electrical: Orange
 - g. Other: Black

- B. Operation and Maintenance manuals - Provide four copies of operation and maintenance manuals for each type of equipment provided on the project. Manuals shall include as a minimum:
 - 1. The Operations and Maintenance Manual Certification Form (copy attached at the end of this Section) which shall be attached to every copy of each Operations and Maintenance Manual submitted.
 - 2. Detailed service, maintenance and operation instructions for each item supplied
 - 3. Special maintenance requirements, along with special calibration and test procedures
 - 4. Operating instructions
 - 5. Preventative maintenance instructions
 - 6. Corrective-maintenance instructions
 - 7. Complete parts lists with stock numbers and name, address, and telephone number of the local supplier
- C. Provide warranties and bonds for items so listed in pertinent sections of the Project Manual.
- D. Provide evidence of compliance with requirements of governmental agencies having jurisdiction.
- E. As specified in Article 15.06.A of Section 00 72 00, provide evidence that all Work, materials and equipment will pass to Owner free and clear of any Liens or other title defects upon final payment. Such evidence may take the form of receipts or releases from all Subcontractors and Suppliers and an affidavit from Contractor as to the completeness of the receipts and releases as described in Section 00 72 00 Article 15.06.A.3.
- F. Provide list of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

1.5 FINAL PAYMENT

- A. Refer to Article 15.05 and 15.06 in 00 72 00, 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

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O&M MANUAL CERTIFICATION FORM

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

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

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

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

SUBMITTED BY: _____ DATE: _____

GENERAL CONTRACTOR'S STAMP

Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

SECTION 02 41 13

SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

- A. Selective demolition including but not limited to roofs, siding, masonry, flashing, HVAC, electrical, and plumbing. Refer to Drawings for selective demolition scope and limits.
- B. Removal and lawful disposal of miscellaneous debris and solid waste located within the Limit of Work.

1.2 RELATED SECTIONS

- A. Section 01 35 29 – Health & Safety Plan

1.3 DEFINITIONS

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

1.4 SUBMITTALS

- A. Quality Control Submittals prior to commencement of on-site demolition:
 - 1. Methods of demolition and equipment proposed for selective demolition. This submittal should be sufficient to demonstrate a thorough understanding of the Work to be completed and the means that will be implemented to safely complete the Work within the Contract Time without damage to surrounding structures or resources. The Engineer will review the submittal for completeness, but will not “Approve” the means and methods.
 - 2. Waste Management Plan to indicate the types of wastes to be generated and the proposed disposal or recycling locations for each waste stream.

3. Copies of any authorizations and permits required to perform the work, including disposal/recycling facility permits and building permits.
- B. Keep and maintain the following records and disposal documentation throughout the project in chronological order in a 3-ring notebook with appropriate tabbed dividers as follows:
1. Records of the amounts of waste generated, by waste type
 2. Evidence of lawful disposal or recycling of all wastes generated
 3. Copies of any analytical results generated as a result of waste stream characterization
 4. Copies of all recycling/disposal receipts
- C. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before Work begins.

1.5 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.6 REGULATORY REQUIREMENTS

- A. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or levied.
- B. Notify and obtain such permits or approvals from all agencies having jurisdiction over the Work, including but not limited to Health, Building, and Fire Departments of the municipality and local, state and federal agencies.
- C. Comply with all applicable federal, state, and local environmental, safety and health requirements regarding the renovation or demolition of structures and other site features and recycling or disposal of demolition debris, as applicable.
- D. Conform to procedures identified in Section 01 35 29 – Health and Safety Plan related to site hazards associated with the project with particular attention towards maintaining compliance with OSHA 1926.62 Lead in Construction regulations when impacting and creating lead dust during impact of any painted surface or component throughout the building.
- E. Prepare and submit to State of Connecticut renovation/demolition notification for all selective demolition activities and pay associated fees. Form shall be submitted at least 10 days prior to the start of Work. Refer to the following link for additional details:

http://www.ct.gov/dph/lib/dph/environmental_health/asbestos/pdf/Demo_Notification09.pdf

1.7 PRE INSTALLATION MEETINGS

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

1.8 JOB CONDITIONS – SELECTIVE DEMOLITION

- A. Conduct selective demolition work in a manner that will minimize need for disruption of owner's normal operations. Provide minimum of two (2) weeks advance notice to owner of demolition activities which will impact owner's normal operations.
- B. The Owner assumes no responsibility for actual condition of items or structures to be demolished. However, variations within the structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
 - 1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of the facility.
 - 2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure of element to be demolished, and adjacent facilities or work to remain.
 - 3. Protect from damage existing finish work that is to remain in place which will become exposed during demolition operations.
 - 4. Protect floors with suitable coverings when necessary.
 - 5. Remove protections at completion of work.
- D. Promptly repair damages caused to adjacent facilities by demolition work at no additional cost to the Owner.
- E. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- F. Do not close, block or otherwise obstruct roadways, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide

alternate routes around closed or obstructed traffic ways if required by governing regulations.

- G. Maintain existing utilities, keep in service, and protect against damage during demolition operations.
- H. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

PART 2 PRODUCTS

2.1 GENERAL

- A. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner that shall not interfere with operation of others at the facility, or employee's access and safety.
- B. Damaged or deteriorated materials shall not be used and shall be promptly removed from the premises.
- C. Waste Containers and Transportation shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without risk of ripping, rupture, or exposure to persons, or emissions to the atmosphere.

2.2 SAFETY SUPPLIES AND EQUIPMENT

- A. Contractor shall comply with Section 01 35 29 and is fully responsible for the implementation and monitoring of all health and safety measures.
- B. Protective Clothing: As applicable, provide workers and approved visitors with disposable coveralls, head and foot coverings, gloves and eye protection (i.e. safety glasses) and half-face respiratory protection including HEPA cartridges.

PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations. Perform lock-out/tag-out procedures as necessary.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
 - 1. Unknown Site Conditions - The information provided on the Drawings and in the Specifications is believed accurate. Field verify all information. Bear full responsibility for obtaining all locations of underground structures, utilities and their connections. Maintain services to buildings outside the limits of work, at no additional cost to the Owner.

- 2. Interior Elements - Interior features including but not necessarily limited to structural elements, walls, partitions, equipment, piping or other building facilities are not shown on the drawings and must be visually inspected. Inspect and appraise all features and facilities to be demolished or removed for salvage. Investigate to assure the condition of the work to be demolished and take all precautions necessary to ensure safety of people and property.
- C. Verify that hazardous materials have been remediated before proceeding with selected demolition operations.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
 - 1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 SITE PREPARATION

- A. Remove and/or stabilize all overhead hazards, prior to commencing work near any building. Where hazards cannot be stabilized, mark and control areas below hazards to prohibit access below the hazards. Similarly, all holes through the floors or weak sections of the floor shall either be covered or clearly marked to prohibit entry. If necessary, floor coverings shall be capable of supporting heavy equipment use.

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of structures and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being selectively demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

2. Cease operations and notify the Owner and the Engineer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
3. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. As necessary, erect and maintain dust-proof partitions and closures as required to prevent spread of dust, fumes or debris to adjacent portions of the building.
 5. Keep outdoors work sprinkled with water to minimize dust. Provide hoses and water connections for this purpose.
 6. Provide temporary weather protection during selective demolition and construction activities until such time that the new infill is constructed.
 7. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Engineer in written, accurate detail. Pending receipt of directive from Engineer, rearrange selective demolition schedule as necessary to continue overall job progress.
 8. Perform selective demolition work in a systematic manner. Provide scaffolding as necessary. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
 9. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 10. Contact local fire department with respect to flame -cutting operations and maintain fire watch as directed by the local fire department.
 11. Maintain adequate ventilation when using cutting torches.
 12. Repair selective demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work.

- 13. Dispose of demolished items and materials promptly. Demolition material shall be removed from the site on a weekly basis as a minimum.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage during selective demolition. When permitted by Designer, items may be removed to suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete (if applicable): Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete (if applicable): Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Masonry (if applicable): Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade (if applicable): Saw-cut perimeter of area to be demolished, and then break up and remove.
- E. Resilient Floor Coverings (If applicable): Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings. Do not use methods requiring solvent-based adhesive strippers.

3.6 DISPOSAL OF DEMOLISHED MATERIAL

- A. General
1. Contractor shall perform any necessary analytical testing to support facility acceptance of the wastes.
 2. Remove demolition waste materials from Project site and legally manage off-site in accordance with the contractor's submitted Waste Management Plan.
 3. Do not allow demolished materials to accumulate on-site.
 4. Burning of demolition waste is not permitted.
 5. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 6. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Provide evidence that the demolition materials have been received at a legal disposal, recycle, reuse or salvage location. Such proof may include truck weight slips from an approved disposal facility or documentation of transfer of title. Transport of all materials off site shall be in accordance with applicable Department of Transportation Regulations. All materials leaving the site shall become the property of the Contractor.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

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SECTION 02 41 19

SELECTIVE DEMOLITION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Electrical demolition

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: as specified in individual Sections.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on field observation and existing record documents. Report discrepancies to the Engineer before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, ceilings, and roof areas scheduled for removal.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- C. Existing Electrical Service: Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- D. Existing Fire Alarm System: Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of this Section.

- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Repair adjacent construction and finishes damaged during demolition and extension work.
- H. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- I. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.4 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangements.

3.5 INSTALLATION

- A. Install relocated materials and equipment as indicated.

END OF SECTION

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SECTION 02 82 13

ASBESTOS ROOFING ABATEMENT

PART 1 GENERAL

1.1 GENERAL PROVISIONS

- A. The Town of Thompson (the “Owner”) plans to replace multi-school roof systems at Thompson Public Schools in Thompson, Connecticut (the “Site”). Asbestos-containing non-friable roofing materials have been identified which will be impacted by the renovations at the following roof locations/systems:
 - 1. Elevator Roof (at original building)
 - 2. Roofs V1/Z1 (at original building)
 - 3. Roof B
- B. The work covered in this section includes the minimum procedures that shall be employed during asbestos roofing abatement.
- C. Refer to other Sections of these Specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

1.2 SUMMARY

- A. Related Documents
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
 - 2. Section 02 82 13, Asbestos Abatement
- B. Related Drawings
 - 1. Fisher/Thompson/Tourtollette Schools Roof Replacement Project, Roof Demolition Plans D-101 and D-105
- C. Related Information
 - 1. Limited Asbestos Bulk Sampling Report, Tighe & Bond, August 27, 2018.

1.3 PROJECT DESCRIPTION

- A. The work to be performed includes but is not limited to the proper removal, handling, and disposal of all asbestos-containing materials (ACM) proposed to be disturbed during the renovation project at the Site.
- B. The Asbestos Abatement Contractor (the “Contractor”) shall review related documents and drawings and conduct visit sites as required to develop a comprehensive understanding of ACM required to be removed at the Site.
- C. Base Bid asbestos roofing abatement work shall include but not be limited to the ACM located in Table 1: Base Bid Scope of Work.

1. The quantities in Table 1 are provided to establish the order of magnitude of the abatement project.
2. Actual quantities may vary.
3. It is the sole responsibility of the Contractor to visit the site, review the Contract Documents and determine the quantities of ACM to be removed when developing their Bid.

TABLE 1: BASE BID SCOPE OF WORK

LOCATION(S)	MATERIAL TYPE	QUANTITY
Elevator Roof (at original building)	Gray Caulk on Metal Flashing	10 LF
Exterior Roofs V1/Z1 (at original building)	Black Caulk on Metal Flashing	40 LF
Exterior Roof B	Black Tar on Exhaust Curbs	50 SF

LF = Linear Feet SF = Square Feet

1.4 APPLICABLE CODES

- A. The Contractor shall be solely responsible for conducting this project and supervising all work in a manner that will be in conformance with all federal, state and local regulations and guidelines pertaining to asbestos abatement. Specifically, the Contractor shall comply with the requirements of the following:
 1. United States Environmental Protection Agency (EPA) National Emissions for Hazardous Air Pollutants (NESHAP) Regulations (Title 40 CFR, Part 61, Subpart M);
 2. Occupational Safety and Health Administration (OSHA) Asbestos Regulations (Title 29 CFR, Part 1926.1101);
 3. Connecticut Department of Energy and Environmental Protection (CTDEEP) Regulations (Section 22a 209 8 (I) and Section 22a 220 of the Connecticut General Statutes);
 4. 2003 International Building Code as adopted by the 2005 State of Connecticut Building Code including the 2009, 2011, and 2013 amendments;);
 5. Connecticut State Fire Safety Code;
 6. Local health and safety codes, ordinances or regulations pertaining to asbestos remediation and all national codes and standards including American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), and Underwriter's Laboratories.
- B. Should the Contractor's removal work practices render the non-friable exterior roofing materials friable and the materials are determined to be Regulated Asbestos-Containing

Materials (RACM), by the Engineer or Consultant, the Contractor shall comply with the requirements of the following:

1. EPA Asbestos Hazard Emergency Response Act (AHERA) Regulations (Title 40 CFR, Part 61, Subpart E);
2. State of Connecticut Department of Public Health (CTDPH) Standards for Asbestos Abatement (Sections 19a-332a- 1 to 19a-332a-16);
3. CTDPH Licensing and Training Requirements for Persons Engaged in Asbestos Abatement and Asbestos Engineer Services (Sections 20-440-1 to 20-440-9 and Section 20-441).

1.5 EXEMPTIONS

- A. This project was designed by a licensed CTDPH Asbestos Project Designer (John R. Hobbins and James T. Webb). Any deviation from these specifications requires the written approval and authorization from the Designer. Plan coordinator is James T. Webb.
- B. If Contractor's work practices render the materials friable, and the materials are determined to be RACM, any deviations from CTDPH Standards for Asbestos Abatement Sections 19a-332a-1 through 19a-332a-16 must be requested in writing and submitted to the CTDPH for approval. It should be noted that these deviations do not necessarily provide the Contractor with a change order.

1.6 WORK SITE SAFETY PLAN

- A. The Contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the work site. The safety plan should include provisions for the following:
 1. Evacuation of injured workers.
 2. Emergency and fire exit routes from all work areas.
 3. Emergency first aid treatment.
 4. Local telephone numbers for emergency services including ambulance, fire, and police.
 - a. A method to notify workers in the event of a fire or other emergency requiring evacuation of the building.
 5. Confined space entry program.
 6. 4-hour site security program.
- B. The Contractor is responsible for training all workers in these procedures.

1.7 RE-OCCUPANCY AIR CLEARANCE

- A. Not applicable for exterior non-friable roof abatement project.

1.8 CONTROL OVER REMOVAL WORK

- A. All Contractor work procedures shall be monitored by the Contractor's "Competent Person" to ensure that areas outside the designated work locations do not become

contaminated. The following controls shall be implemented each working day to help ensure this:

1. Prior to work on any given day, the Contractor's designated "Competent Person" shall evaluate and implement job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination enclosure systems.
- B. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:
1. Nonessential personnel are prohibited from entering the area;
 2. All authorized personnel entering the work area shall sign the work area entry log;
 3. All authorized personnel entering the work area shall read the "worker protection procedures" which are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing;
 4. All personnel who are exiting from the decontamination enclosure system shall be properly decontaminated;
 5. Asbestos waste that is removed from the work area must be properly bagged and labeled in accordance with applicable regulations and these specifications. The surface of the bags shall be decontaminated. Asbestos waste leaving the work area must be transported off site by the end of the work shift or immediately placed in a locked, properly labeled and leak-tight temporary on-site storage area, and must be removed within 24 hours of the project conclusion. The location of the temporary storage area shall be coordinated with the owner or the owner's representative.
 6. Any material, equipment, or supplies that are brought out of the decontamination enclosure system shall be cleaned and decontaminated by wet cleaning and/or HEPA vacuuming of all surfaces.

1.9 SITE SECURITY

- A. The Contractor shall be responsible for the security of regulated areas. The Contractor shall post all required asbestos abatement warning signs at entrances to the work area including the waste load out and worker decontamination chamber. The Contractor shall have a supervisor monitoring the entrance of the worker decontamination chamber during abatement work.

1.10 PERSONNEL PROTECTION

- A. Prior to commencing work, instruct all workers in all aspects of personnel protection, work procedures, emergency procedures use of equipment including procedures unique to this project.
- B. Respiratory protection shall meet the requirements of OSHA as required in Title 29 CFR Parts 1910.134, 1926.11, and 1926.62.
- C. A formal respiratory protection program must be implemented in accordance with Title 29 CFR, Part 1926.1101 and Title 29 CFR, Part 1910.134.

- D. The Contractor shall conduct exposure assessment air sampling, analysis and reporting to ensure the workers are using appropriate respiratory protection.
- E. The Contractor shall provide appropriate respiratory protection for each worker and ensure usage during potential asbestos exposure.
- F. The Contractor shall provide respirators from among those approved as being acceptable for protection by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of Title 30 CFR, Part II.
- G. The Contractor shall provide an adequate supply of filter for respirators in use.
- H. Minimum respiratory protection shall be as follows:

<u>Air borne Asbestos Level:</u>	<u>Required Respirator:</u>
Not in excess of 1 f/cc (10 x PEL)	Half mask air purifying or otherwise as required respirator other than a disposable respirator, equipped with HEPA P 100 filters
Not in excess of 5 f/cc (50 x PEL)	Full facepiece air purifying respirator equipped with HEPA P 100 filters.
Not in excess of 100 f/cc (1,000 x PEL)	Tight-fitting powered air purifying respirator equipped with HEPA P 100 filters or any supplied air respirator operated in continuous flow mode.
Not in excess of 100 f/cc (1,000 x PEL)	Full facepiece supplied air respirator operated in pressure demand mode.
Greater than 1,000 f/cc (10,000 x PEL)	Full facepiece supplied air respirator unknown operated in pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus

Note:

1. Respirators assigned for higher airborne fiber concentrations may be used at lower concentrations.
2. A high efficiency filter means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers in diameter or larger.
3. In addition to the selection criteria in paragraph 1.13F, the Contractor shall provide a tight-fitting powered air purifying respirator equipped with high efficiency filters or a full facepiece supplied air respirator operated in the pressure demand mode equipped with HEPA egress cartridges or an auxiliary positive pressure self- contained breathing apparatus for all employees within the regulated area where Class I work is being performed for which a negative exposure assessment has not been produced and the exposure assessment

indicates the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions if the exposure assessment indicates exposure levels above 1 f/cc as an 8-hour time weighted average.

4. If compressed air is used for supplied air respirators, this air will meet the requirements for grade D breathing air as described by the Compressed Gas Association Commodity Specification G-7.1-1966. The compressor will be equipped with the necessary safety devices and sorbents/filters, and be situated to avoid entry of contaminated air. In addition, the compressor will be equipped with alarms to indicate failure or overheating, and additional alarms for indicating the presence of carbon monoxide. Airline couplings will be incompatible with outlets for other gas system to prevent inadvertent servicing of airline respirators with non-respirable gases.
 - I. The Contractor shall provide and require all workers to wear protective clothing in Work Areas where asbestos fiber concentration exceed permissible limits established by the OSHA or where contamination exists. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings.
 - J. The Contractor shall ensure that all authorized persons entering contaminated areas are equipped with proper respirators and protective clothing.

1.11 WORKER PROTECTION PROCEDURES

- A. The Contractor shall monitor airborne asbestos concentrations in the workers' breathing zone to establish conditions and work procedures for maintaining compliance with OSHA Regulations Title 29 CFR Parts, 1910.1001 and Part 1926.1101.
- B. The Contractor's air sampling professional shall document all air sampling results and provide all air sampling reports as soon as feasible. OSHA air monitoring results shall be posted at a conspicuous location at the job site.
- C. All personnel air sampling shall be conducted in accordance with methods described in OSHA standards Title 29 CFR Parts 1910.1001 and Part 1926.1101.
- D. The Contractor is responsible for complying with all additional OSHA regulations while performing work on this project.

1.12 WORKER QUALIFICATIONS, TRAINING, AND EDUCATION

- A. Contractor is required to have a minimum OSHA Class II-certified Supervisor on-site at all times work is in progress.
- B. Contractor is required to have an accredited asbestos Supervisor in each work area at all times work is in progress. Supervisor shall be fluent in English.
- C. The Supervisor shall be thoroughly familiar and experienced with asbestos abatement and related work, and shall enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of EPA, OSHA, and NIOSH requirements and guidelines.
- D. Enforce strict discipline and good working order at all times among employees, and do not employ any person not skilled in the work assigned, nor anyone who has not received documented notice of the hazards of asbestos abatement, formal training in the

use of respirators, safety procedures, equipment, clothing, and work procedures. All workers shall be licensed in accordance with applicable state regulations.

1.13 SUBMITTALS

- A. The Contractor will submit two (2) copies of the following submittals to the Engineer ten (10) calendar days prior to the commencement of removal work:
1. Submit a schedule to the Owner and the Engineer that defines a timetable for executing and completing the project, including work area preparations, removal, cleanup, decontamination, and final clearance air monitoring (if applicable).
 2. Waste generator label to be used.
 3. Waste shipment and disposal form to be used with generator information.
 4. Submit the name and address of the hauling contractor and landfill to be used. Also submit current valid operating permits and certificates of insurance for the transporter and landfill.
 5. Current asbestos training certificate, respirator fit-test record, and medical record for the Supervisor.
 6. Asbestos roofing abatement training certificates, respirator fit-test records and medical records of each employee who may be on the project site.
 7. The qualifications of the hygiene firm that the Contractor proposes to use for this project to analyze Contractor employee OSHA monitoring samples.
 8. Submit a written site-specific Respiratory Protection Program for employees for the Work, including make, model and National Institute of Occupational Safety and Health (NIOSH) approval numbers of respirators to be used at the Site (if applicable).
 9. Copies of all SDS sheets for materials to be used on site.
 10. Submit a site-specific Emergency Action Plan for the project. The Emergency Action Plan may include emergency procedures to be followed by Contractor personnel to evacuate the building, hospital name and phone number, most direct transportation route from the Site, emergency telephone numbers, etc. If this information is contained within an Emergency Action Plan prepared by the Site's General Contractor, a copy shall be submitted for review.
 11. Submit a chain-of-command for the project.
- B. The Contractor will submit the following to the Engineer during the course of the work:
1. Daily results of all personal air sampling.
 2. Certificate, training, medical, and fit-test records for new employees to start work (24 hours in advance of work).
 3. Contractor site logs.
 4. Revised Notification, if any.
 5. Copies of Waste Shipment Records for waste that leaves the site.

C. The following shall be submitted to the Engineer within forty-five days of the completion of work:

1. Completed copies of Waste Shipment Records (WSR).
2. Remaining personal air sampling results and site logs.

1.14 NOTIFICATIONS, POSTINGS, SUBMITTALS, AND PERMITS

A. The Contractor shall make the following written notifications, and provide the submittals to the following agencies prior to the commencement of abatement if the work is going to render the nonfriable asbestos roofing materials friable. These notifications are required 10-calendar days prior to the start of the abatement project:

1. Connecticut Department of Energy and Environmental Protection
Health Services and Solid Waste Management Unit
79 Elm St.
Hartford, CT 06106
(Only if asbestos waste is disposed of in Connecticut)
2. Connecticut Department of Public Health
410 Capital Avenue
MS #51 AIR
P.O. Box 340308
Hartford, CT 06134
(only if material is to be treated as RACM)
3. Environmental Protection Agency
5 Post Office Square – Suite 100
Boston, MA 02109-3912

B. The minimum information included in the notification to these agencies includes:

1. Name and address of building Owner/Operator
2. Building location
3. Building size, age, and use
4. Asbestos quantity
5. Work schedule, including proposed start and completion date
6. Asbestos removal procedures to be used
7. Name and location of disposal site for generated asbestos waste, residue, and debris
8. If landfill opens in Connecticut to accept ACM waste, Engineer will notify DEEP prior to utilizing said landfill

1.15 DEFINITIONS

A. The following definitions relative to asbestos roof abatement shall apply:

1. Abatement - Procedures to control fiber release from ACM; includes removal, encapsulation, and enclosure.
2. Air Monitoring - The process of measuring the total airborne fiber concentration of an area or exposure of a person.

3. Amended Water - Water to which a surfactant has been added.
4. Asbestos - The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically altered.
5. Asbestos Felt: A product made by saturating felted asbestos with asphalt, or other suitable bindery, such as a synthetic elastomer.
6. Asbestos Fibers - Those particles with a length greater than five (5) microns (μ) and a length to diameter ratio of 3:1 or greater.
7. Asbestos Work Area - A regulated area as defined by OSHA Title 29 CFR, Part 1926.1101 where asbestos abatement operations are performed that is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
8. Base Flashing (Roof) - The flashing provided by upturned edges of a water-tight membrane on a roof. May contain metal and associated waterproofing material or combination of roofing felts and waterproofing at the joint between a roofing surface and a vertical surface, such as a wall or parapet. Also, base flashing may be present at perimeter of completely flat roof.
9. Category I Non-Friable Material – Asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products.
10. Caulking - Resilient mastic compound often having a silicone bituminous or rubber base; used to seal cracks, fill joints, and prevent leakage. Typical applications: around windows, and doors. Caulking is at joints between two dissimilar materials. (i.e., masonry to wood, masonry to steel)
11. Clean Room - An uncontaminated area or room, which is a part of the worker decontamination system with provisions for storage of workers' street clothes and protective equipment.
12. Competent Person - As defined by OSHA Title 29 CFR, Part 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. Person who has authority to take prompt corrective measures to eliminate such hazards during asbestos removal. Competent person shall be properly trained in accordance with EPA Model Accreditation Plan (MAP).
13. Curtained Doorway - A device to allow ingress and egress from one area to another while permitting minimal air movement between the areas. Two curtained doorways spaced a minimum of six feet apart can form an airlock.
14. Decontamination System – A series of connected areas, with curtained doorways between any two adjacent areas, for worker and equipment decontamination. A decontamination system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
15. Engineer -The third- party Engineering/Environmental Engineer for the project.

16. Equipment Room - Any contaminated area or a room that is part of the worker decontamination system with provisions for storage of contaminated clothing and equipment.
17. Fixed Object - Unit of equipment or furniture in the work area that cannot be removed from the work area.
18. GFCI – Ground Fault Circuit Interrupter
19. HEPA – High Efficiency Particulate Air
20. HEPA Filter - Filter in compliance with ANSI Z9.2 1979.
21. HEPA Vacuum Equipment - Vacuum equipment equipped with a HEPA filter system for filtering the air effluent.
22. Movable Object - Unit of equipment of furniture in the work area that can be removed from the work area.
23. NESHAP - National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.
24. Permissible Exposure Limit (PEL) - The maximum total airborne fiber concentration to which an employee is allowed to be exposed. The limit established by OSHA Title 29 CFR, Part 1926.1101 is 0.1 fibers/cc as an 8-hour TWA and 1.0 fibers/cc averaged over a sampling period of 30 minutes as an Excursion Limit. The Contractor shall be responsible for maintaining work areas in a manner that this standard is not exceeded.
25. Project Monitor - A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or an engineer with experience in asbestos air monitoring and worker protection equipment and procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.
26. Regulated Asbestos-Containing Material (RACM) – Is a friable ACM, or a Category I non-friable ACM that has become friable or will be or has been subjected to sanding, grinding, cutting or abrading, or Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by force expected to act on the material during demolition or renovation operations.
27. Regulated Area - An area established by the employer to demarcate where Class I, II, and III asbestos abatement is conducted, and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which airborne concentrations of asbestos exceed or there is a reasonable possibility that they may exceed the PEL.
28. Shower Room - A room between the clean room and the equipment room in the work decontamination system with hot and cold running water and suitably arranged for employee showering during decontamination. The shower room is located in an airlock between the contaminated area and the clean area.

1.16 PRECONSTRUCTION MEETING

- A. The Contractor shall be required to attend a preconstruction meeting with his site supervisor, project manager and any sub-contractor they employ on site for the purpose of reviewing the contract requirements.

PART 2 MATERIALS AND EQUIPMENT

2.1 MATERIALS

- A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.
- B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed of as asbestos waste.
- C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to job site with factory label indicating 4 or 6 mil.
- D. Polyethylene disposable bags shall be true six (6) mil with preprinted labels.
- E. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.
- F. Surfactant (wetting agent) shall consist of 50 percent polyoxyethylene ether and 50 percent polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one ounce surfactant to five gallons of water or as directed by manufacturer.
- G. Impermeable containers are to be used to receive and retain any asbestos containing or contaminated materials until disposal at an acceptable disposal site. (The containers shall be labeled in accordance with OSHA Standard Title 29 CFR, Part 1926.1101.) Containers must be both air and watertight.
- H. Labels and signs, as required by OSHA Standard Title 29 CFR, Part 1910.1001 will be used.
- I. Encapsulant shall be bridging or penetrating type which has been found acceptable to Tighe and Bond. Usage shall be in accordance with manufacturer's printed technical data.
- J. Disposal labels shall be preprinted on self-adhesive labels with the generator name, abatement site and contractor's name and address. Labels shall not be photocopied and applied with spray adhesive.

2.2 TOOLS AND EQUIPMENT

- A. Provide suitable tools for asbestos removal, encapsulation, and enclosure.
- B. The Contractor Personnel exposure surveillance per OSHA requirements.
- C. The Contractor shall have available sufficient inventory on site for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape, and air filters.
- D. The Contractor shall provide temporary electrical power sources such as generators (when required).

- E. Vacuum units, of suitable size and capacities for project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.
- F. The Contractor shall have available spray equipment capable of mixing a wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas with asbestos.

PART 3 EXECUTION

3.1 GENERAL PREPARATION PROCEDURES

- A. Upon receipt of a Notice to Proceed, meet with the Owner at the site to reach agreement on:
 - B. Scope and manner of work performance and all schedules.
 - C. Contractor, subcontractor, and vendor vehicle access and parking.
 - D. Contractor access to the work areas, including approved doors, stairways, and corridors.
 - E. Location of electrical, water supply, and wastewater drain connection points, if available.
 - F. Determination of all equipment and other items to be removed from the work areas, and the location of temporary storage space, if applicable.
 - G. Any other logistical factors to minimize interference with the Owner, public safety and health, and other Contractor activities.
 - H. Prepare the work areas according to the following general sequence of procedures to ensure that proper fiber containment and protection systems are installed before any work which could generate airborne asbestos fibers.
 - I. Erect barricades, post access restriction signs, seal all openings into the work area airtight (including doors, chases, shafts, and other vertical penetrations), and erect or install Decontamination Facilities.
 - J. Obtain formal approval from Asbestos Project Monitor of all preparation work areas before commencing asbestos removal. Asbestos Project Monitor shall be given at least 48 hours notification of the intent to start removal work in any work area.

3.2 ASBESTOS REMOVAL OPERATIONS

- A. Operations involving the cutting or abrading of asphalt-based asbestos roofing material is considered to release sufficient friable material thus constituting an asbestos abatement activity.
 - 1. All work using such equipment must be performed by licensed asbestos workers in a negative pressure enclosure in accordance with the requirements of CTDPH Standards for Asbestos Abatement.
 - 2. These restrictions may be lifted if slicing equipment or manual means to remove the asbestos materials and EPA and/or state guidance on abatement of roofing materials is followed.

3.3 WORK AREA PREPARATION

- A. Where necessary deactivate electrical power. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All installations are to be made by a State of Connecticut-licensed electrician.
- B. Deactivate and/or isolate heating, ventilating, and air conditioning (HVAC) air systems or zones to prevent contamination and fiber dispersal within the structure. During the work, rooftop vents around the work area shall be completely sealed with duct tape and two layers of 6-mil poly sheeting.
- C. Completely seal all openings, including, but not limited to, roof level HVAC air intake sources, windows adjacent to removal (within ten feet) skylights, ducts, grills, diffusers, and any other penetration of the work areas, with a minimum of 6-mil poly sheeting, sealed with duct tape.
- D. Where exterior cementitious asbestos containing roof shingles are to be removed outdoors, post asbestos abatement warning signs and erect temporary barricades to create regulated areas. Regulated areas should be kept clear of any persons not fully trained and protected against exposure.
- E. Install single six-mil drop cloths extending a minimum of 10 feet from the exterior wall of the building. Extend polyethylene sheeting outward from the base of the structure in order to collect debris when working from higher elevations. Install single six-mil critical barriers over any louvers, vents or penetrations into the building interior within or directly adjacent to the regulated area.
- F. Maintain an operable remote worker decontamination system in accordance with Section 3.4 of this Specification.
- G. Maintain a work area access control log for each exterior work area.

3.4 REMOTE PERSONNEL DECONTAMINATION SYSTEM

- A. The Contractor shall establish a remote personnel decontamination system where contiguous decontamination systems are not feasible. The use of a remote decontamination unit must be indicated on the State Notification of Asbestos Abatement. Access between the contaminated and uncontaminated areas shall be through this decontamination enclosure only. The decontamination system shall be constructed of two layers of six-mil polyethylene sheeting. Pre-fabricated "pop-up" decontamination chambers will not be permitted on this project.
- B. Access between rooms in the decontamination system shall be through double flap-curtained openings. The clean room, shower, and equipment rooms within the decontamination enclosure shall be completely sealed.
- C. Construct the decontamination system with plastic, wood, or metal framing and cover both sides with a double layer of 6-mil poly sheeting, sealed with spray glue or tape at the joints.
- D. The Contractor shall visually inspect barriers routinely to assure effective seal, and the Contractor shall repair defects immediately.

3.5 WORK PROCEDURE

- A. Asphalt Based Roofing and Caulking Materials:
 - 1. Perform procedures are necessary including the application of wet methods and covering materials to ensure that release of asbestos materials is reduced to no

visible emissions. Work using any cutting or abrading equipment must be performed in a negative pressure enclosure.

2. Remove asbestos roofing and caulking materials using tools and equipment specified in regulatory guidance documents.
3. Continuously mist the work area as asbestos roofing and caulking materials are being removed from the structure.
4. All asbestos roofing and caulking materials must be removed intact.
5. All loose debris shall be immediately collected via HEPA vacuum or wet wipe. The vacuum debris and wipe materials shall be segregated and disposed as asbestos contaminated waste.
6. Wet methods shall be used whenever operations call for the scraping of resilient roofing materials or mastic.
7. Where cutting and abrading is prohibited, a negative pressure enclosure is not required. Waste must be lowered by a crane, hoist or dust-tight chute, in accordance with applicable regulations.

3.6 FINAL WORK AREA CLEANUP AND DECONTAMINATION

A. General Requirements

1. After all asbestos-containing or contaminated materials have been removed, remove all waste and perform a final cleanup and decontamination of each work area. Final cleaning shall be performed only after all waste is packaged and removed, but before reinstalling or demolishing any equipment, or dismantling any barriers, decontamination facilities, or protective coverings.

B. Cleaning Methods and Approval

1. Thoroughly clean all waste containers and removal equipment with a HEPA-filtered vacuum, decontaminated with the use of amended water, and then remove from the work area.
2. All surfaces in the work area shall be thoroughly wiped clean and, after drying, thoroughly decontaminated with a HEPA-filtered vacuuming device and encapsulated.
3. After cleaning, Asbestos Project Monitor shall inspect the site. To facilitate, notify Asbestos Project Monitor of the anticipated completion of the site cleaning at least 48 hours in advance.
4. If any waste or debris is observed within the work area during the inspection, perform additional cleanup and decontamination.
5. If clearance air sampling is required, for any results above the Air Quality Standard, perform additional cleaning and decontamination, and repeat the inspection and air tests, at no additional cost to the Owner.
6. If clearance air sample results are below the Air Quality Standard, the licensed third-party project monitor will give approval for Contractor to remove all protective coverings which do not comprise part of the work area seal or decontamination facility.

7. Upon completion of the cleaning, repair all temporary access openings and correct all unsafe conditions.

3.7 WASTE PACKAGING AND REMOVAL PROCEDURE

- A. The Contractor shall strictly adhere to the requirements of this section for ACM waste packaging and transporting waste from the work area enclosure to the disposal dumpster.
- B. Waste disposal bags and drums shall be affixed with pre-printed OSHA warning labels, DOT labels and NESHAP labels.
- C. Each container of ACM waste shall be made adequately wet prior to sealing the container. Bags shall be sealed immediately following additional wetting procedures. Bags of ACM waste shall not be permitted to remain unsealed while in the work area enclosure.
- D. Each bag of ACM waste shall be double-bagged during waste load out procedures. The following waste load out procedure shall be strictly adhered to:
 1. Wet wipe inner bag or drum to remove all ACM contamination. Ensure the inner bag is sealed.
 2. Transport bag or drum to the equipment room located in the worker decontamination enclosure.
 3. One worker, equipped with personal protective equipment, shall be inside the clean room of the worker decontamination enclosure.
 4. The worker in the clean room of the decontamination enclosure shall open a six-mil disposal bag and hold it open inside the shower room where the inner bag containing the ACM waste shall be placed.
 5. The outer bag shall be sealed with duct tape inside the shower room.
 6. The double bagged or drummed waste shall be removed from the decontamination enclosure and waste generator labels shall be immediately affixed to the outer bag or drum.
 7. Waste generator labels shall be printed, self-adhering labels and shall contain the Owner's name, the site location address, and the Contractor's name.
 8. The properly labeled waste shall be transported directly to the lined waste container.
 9. The waste container shall be double lined with 6-mil polyethylene sheeting.
 10. OSHA warning signs shall be secured to the waste container prior to any loading and unloading operations.
 11. The waste container shall be kept locked at all times except during loading and unloading.

3.8 DISPOSAL OF ASBESTOS AND ASBESTOS CONTAMINATED WASTE

- A. All asbestos containing and or asbestos contaminated material disposal must be in compliance with requirements of the CTDEEP, CTDPH, and the EPA NESHAP regulations.

- B. All asbestos-containing waste material transported off the facility site shall have a waste shipment record that includes the following information:
 - 1. The Owner's name, address, and telephone number.
 - 2. The name of the Disposal Site Operator, address, and telephone number
 - 3. The name of the Disposal Site, address, telephone number, date transported, and certification of the Disposal Site for accepting asbestos containing waste
 - 4. The name of the Waste Transporter(s), address, and telephone number. Certification provided to the Owner or Engineer that the contents of the waste are accurately described by proper shipping name, accurate classification, packaged, labelled/marked, and are in good condition for transport.
 - 5. The approximate quantity of asbestos waste in cubic yards, friable or non-friable asbestos, type of packaging utilized for disposal.
- C. Disposal approvals shall be obtained from the CTDEEP before commencing asbestos removal if waste will be disposed of in Connecticut.
- D. Waste container storage locations shall be pre-approved by the Owner and Engineer.
- E. A copy of approved disposal authorization shall be provided to the Owner and Engineer and any required federal, state or local agencies.
- F. Copies of all landfill receipts will be retained by the Engineer as part of the project file. The receipts will be signed by the landfill operator on receipt, and the quantity of asbestos debris leaving the job site and arriving at the landfill acknowledged.
- G. All asbestos debris shall be transported in covered, sealed vans, boxes or dumpsters, which are physically isolated from the driver by an airtight barrier. All vehicles must be properly licensed to meet United States Department of Transportation (USDOT) requirements.
- H. Friable ACM waste shall be placed in double lined enclosed waste containers equipped with a lockable hasp. Waste containers shall be posted with OSHA warning signs during loading and unloading.
- I. Liquid wastes solely associated with asbestos-containing materials shall be solidified. Liquids associated with PCB removal shall not be solidified and shall be disposed of PCB Remediation waste in leak-tight containers. At no time will liquid wastes be permitted to be stored on site.
- J. Completed Waste Shipment Records (WSR) signed by the landfill must be returned to the Owner or Engineer no later than 45 days from the time the waste was transported off-site. Completed waste shipment records that are not received by the Owner within 35 days shall require the Contractor to begin tracking the waste. The Contractor must notify the Owner of intentions on tracking the waste.
- K. The Contractor must take appropriate actions as outlined in Title 40 CFR Part 61 NESHAP regulations when completed WSR are not forwarded to the Owner or Engineer within 45 days from the time the waste was transported off-site.

3.9 ASBESTOS PROJECT MONITOR INSPECTION RESPONSIBILITIES

- 1. Asbestos Project Monitor shall conduct inspections throughout the progress of the abatement project. Inspections shall be conducted to document the progress

of the abatement work, as well as the procedures and practices employed by the Contractor. The Asbestos Project Monitor shall be an independent third party hired by the Owner.

- B. The Asbestos Project Monitor shall perform the following inspections during abatement activities:
1. Pre-commencement Inspection. Pre-commencement inspections shall be performed at the time requested by the abatement Contractor. The Asbestos Project Monitor shall be informed a minimum of 48-hours prior to the time the inspection is required. If deficiencies are identified during the pre-commencement inspection, the Contractor shall perform the necessary adjustments to obtain compliance.
 2. Work Area Inspection. Work area inspections shall be conducted at the discretion of the Asbestos Project Monitor. During the work inspections, the Asbestos Project Monitor shall observe the Contractor's removal methods and procedures, verify barrier integrity, monitor negative air filtration devices, assess project progress, and inform the Contractor of specific remedial activities if deficiencies are noted.
 3. Final Visual Inspection. Upon request of the Contractor, the Asbestos Project Monitor shall conduct a final work area visual inspection. If residual dust or debris is identified during the final inspection, the Contractor shall comply with the request of the Asbestos Project Monitor to render the area "dust free."

END OF SECTION

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SECTION 04 01 20

MAINTENANCE OF UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Repointing existing damaged masonry joints.
 - 2. Replacing existing damaged masonry units.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C 90 - Standard Specification for Loadbearing Concrete Masonry Units
 - 2. ASTM C 144 - Aggregate for Masonry Mortar
 - 3. ASTM C 150 - Portland Cement
 - 4. ASTM C 207 - Hydrated Lime for Masonry Purposes
 - 5. ASTM C216 - Facing Brick (Solid Masonry Units Made from Clay or Shale)
 - 6. ASTM C 270 – Mortar for Unit Masonry

1.3 SUBMITTALS

- A. Provide submittals in accordance with Section 01 33 00.
- B. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Replacement units indicating manufacturer recommendation for each application.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Documented experience in completion of work, similar in design, material, and extent specified.

1.5 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.6 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade.

1. Prevent contamination of aggregates.
 - B. Protect products from damage during handling and construction operations.
- 1.7 PROJECT CONDITIONS
- A. Environment:
 1. Cold Weather Requirements: Maintain mortar ingredients and substrate within temperature range between 40 degrees F and 120 degrees F when outside temperature is less than 40 degrees F.
 2. Hot Weather Requirements: Protect mortar-joint from evaporation of moisture from mortar material. When required, provide adequately shaded work area.
- 1.8 WARRANTY
- A. Provide contractor's warranty to cover all defects in workmanship for a period of two (2) years from date of acceptance.
- PART 2 PRODUCTS
- 2.1 MATERIALS
- A. Mortar Components:
 1. Hydrated Lime: ASTM C207, Type S.
 2. Aggregate: ASTM C144.
 3. Portland Cement: ASTM C150, Type I.
 4. Water: Potable, free of substances that are detrimental to grout, masonry, and metal.
- 2.2 PRODUCTS - GENERAL
- A. Provide each product from one manufacturer and from one production run.
- 2.3 REPLACEMENT MASONRY UNITS
- A. Face Brick:
 1. ASTM C216, matching existing.
 2. Efflorescence: Rated slight efflorescent when tested according to ASTM C67.
 - B. Concrete Masonry Units:
 1. ASTM C90, matching existing.
- 2.4 MIXES
- A. Pointing Mortar: ASTM C270.
 1. Type N.

2.5 ACCESSORIES

- A. Cleaning Agent: Soapless, non-acidic detergent, specially prepared for cleaning masonry.

PART 3 EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
 - 1. Protect from mortar droppings and cleaning operations.
- C. Remove existing fixtures and fittings concealing masonry joints to permit repointing and repair.

3.2 EXISTING DAMAGED MORTAR JOINTS

- A. Cut out existing damaged bed and head mortar joints, to uniform depth of 3/4 inches, or to sound mortar without damaging edges and faces of existing masonry units to remain.
 - 1. For running bond masonry, angle grinders and similar wheeled cutting devices shall not be used on vertical joints.
- B. Remove dust and debris from joints.
 - 1. Do not rinse when temperature is below freezing.

3.3 TUCK POINTING

- A. Dampen joints immediately before tuck pointing. Allow masonry units to absorb surface water.
- B. Tightly pack tuck pointing mortar into joints in thin layers, 1/4 inch thick, maximum.
- C. Allow layer to become slightly hardened before applying next layer.
- D. Pack final layer flush with surfaces of masonry units.

3.4 MASONRY UNIT REPLACEMENT

- A. Cut out mortar joints surrounding masonry units requiring replacement.
 - 1. For running bond masonry, angle grinders and similar wheeled cutting devices shall not be used on vertical joints.
 - 2. Remove existing masonry units creating opening for replacement masonry unit installation.
 - 3. Remove mortar, dust, and debris from opening perimeter surfaces.

- B. Dampen surfaces of surrounding existing masonry before installing replacement masonry units.
 - 1. Allow existing masonry to absorb surface moisture before installing replacement units.
 - 2. Butter contact surfaces of existing masonry and replacement masonry units with mortar.
 - 3. Center replacement masonry units in opening and press into position.
 - 4. Remove excess mortar.
 - 5. Tuck point replacement masonry units to ensure full head and bed joints.

3.5 JOINT TOOLING AND SURFACE PREPARATION

- A. Strike flush repointed and replaced masonry joints when mortar becomes slightly hardened.

3.6 CLEANING

- A. Remove mortar splatter from exposed surfaces immediately.
- B. Clean exposed masonry surfaces on completion.
- C. Remove mortar droppings and other foreign substances from wall surfaces.
- D. Wet surfaces with clean water.
- E. Wash with cleaning agent.
- F. Brush masonry surfaces with stiff fiber brushes while washing.
- G. Immediately after washing, rinse with clean water.
 - 1. Remove traces of detergent, foreign streaks or stains.

END OF SECTION

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SECTION 05 05 00

WELDING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Welding for fabrication and installation of metals
- B. Related Sections
 - 1. Section 05 30 00 – Metal Decking

1.2 REFERENCES

- A. American Society of Mechanical Engineers (ASME):
 - 1. BPVC SEC V, Nondestructive Examination.
 - 2. BPVC SEC IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.
- B. American Society of Nondestructive Testing (ASNT): SNT-TC-IA, Personnel Qualification and Certification in Nondestructive Testing.
- C. American Welding Society (AWS):
 - 1. B2.1, Specification for Welding Procedure and Performance Qualification.
 - 2. D1.1, Structural Welding Code - Steel.
 - 3. D1.3, Structural Welding Code - Sheet Steel.
 - 4. QC 1, Standard for AWS Certification of Welding Inspectors.

1.3 DEFINITIONS

- A. CWI-Certified Welding Inspector.
- B. NDT-Nondestructive Testing.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. Shop and field welding procedure specifications (WPS).
 - 2. Procedure qualification records (PQR).
- B. Quality Control Submittals:
 - 1. Welder/welding operator performance qualifications (WPQ).
 - 2. Certified welding inspector (CWI) credentials.
 - 3. Shop inspection and quality control records when requested.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Welding Procedure Specifications: In accordance with AWS D1.1 (Annex E) or AWS B2.1 (App. A) or ASME BPVC SEC IX (Forms QW-482 and QW-483).
 - 2. Welding Procedure Specifications: In accordance with AWS D1.1 (Annex E) or AWS B2.1 (App. A) or ASME BPVC SEC IX (Forms QW-482 and QW-483).
 - 3. Welding Inspector: Certified in accordance with AWS QC 1, and having prior experience with the welding codes specified.
 - 4. Testing Agency: Personnel performing tests shall be NDT Level II Certified in accordance with ASNT SNT-TC-1A.

1.6 SEQUENCING AND SCHEDULING

- A. Unless otherwise specified, Submittals required in this Section shall be submitted and approved prior to commencement of welding operations.

PART 2 PRODUCTS

2.1 SOURCE QUALITY CONTROL

- A. Welding fabrication, materials, and workmanship shall be subjected to inspection and testing during the fabrication process.
- B. Welding of parts shall be in accordance with the Standard Code for Arc and Gas Welding in Building Construction of the AWS and shall only be done where shown, specified, or permitted by the Engineer.
- C. Welding shall be done only by welders certified as to their ability to perform welding in accordance with the requirements of the AWS Code.
- D. Component parts of built-up members to be welded shall be adequately supported and clamped or held by other adequate means to hold the parts in proper relation for welding.
- E. Notify the Owner’s Project Representative prior to the start of any fabrication or other phases of the work to afford them reasonable opportunity to inspect work.
- F. A Certified Welding Inspector (CWI) shall be retained by the fabricator to visually inspect all fabrication welds in accordance with AWS D1.1, Section 6 and Table 6.1, Visual Acceptance Criteria.
- G. The CWI shall be present whenever shop welding is performed. The CWI shall perform inspection before, during, and after welding. CWI duties include:
 - 1. Verifying conformance of specified job material and proper storage.
 - 2. Monitoring conformance with approved WPS.
 - 3. Monitoring conformance of WPQ.
 - 4. Inspecting weld joint fit-up and in-process inspection.
 - 5. Providing 100 percent visual inspection of all welds.
 - 6. Supervising nondestructive testing personnel and evaluating test results.

- 7. Maintaining records and preparing report confirming results of inspection and testing comply with the Work.
- H. Maintain inspection and quality control records of shop work.
- I. Acceptance of work at the shop shall not prevent its final rejection at the jobsite, even after erection, if it is found to be defective in any way.
- J. Nondestructive testing of fabrication welds will be conducted by an independent Testing Agency, retained by the Owner, in accordance with the criteria specified below and in conjunction with the testing required for field welding.

PART 3 EXECUTION

3.1 GENERAL

- A. Welding and Fabrication by Welding:
 - 1. Conform to governing welding codes referenced in the attached Welding and Nondestructive Testing Requirements Data Sheet.
 - 2. Each welder working on the project, whether in the shop or in the field, shall be assigned an identification symbol or mark. Each welder shall mark or stamp his identification symbol at each weldment completed, whether in the shop or in the field.

3.2 WELDING STRUCTURAL STEEL

- A. Where structural joints are required to be welded, details of joints, technique of welding employed, appearance and quality of welds made, and methods used in correcting defective work shall conform to AWS D1.1.
- B. Welds shall be sound throughout and have no cracks or imperfections. The face of welds shall be dressed flush and smooth.
- C. Welded joints shall be rigid and continuously welded or spot welded as specified or shown. Exposed joints shall be close fitting and jointed where least conspicuous.
- D. Base metals shall be checked by Contractor to ensure absence of laminations or other defects.
- E. Groove and butt joint welds shall be full penetration welds, unless otherwise indicated.
- F. Shop Welding Process:
 - 1. Shielded metal arc.
 - 2. Submerged arc.
 - 3. Gas metal-arc.
 - 4. Flux cored-arc
 - 5. Other process as approved by the Engineer.

3.3 WELDING METAL DECK

- A. Where metal deck joints are required to be welded, details of joints, technique of welding employed, appearance and quality of welds made, and methods used in correcting defective work shall conform to AWS D1.3.

- B. Before any welding of the metal deck is done, two specimens of each type of weld shall be prepared by each operation. These specimens shall be inspected, tested, and approved by the Engineer before that operator shall be permitted to weld on the structure.
- C. Burning or weakening of the metal deck material around welds shall be cause for rejection. Deficient welds shall either be repaired or entirely removed and rewelded or the metal deck shall be reinforced or replaced, as directed by the Engineer.
- D. Metal deck panels shall be arc-welded to the supporting steel beams or bearing plates in accordance with the following minimum requirements:
 - 1. Welding washers of a type approved by the Engineer shall be used in connecting any metal deck material less than 18-gauge in thickness.
 - 2. Ends and end laps - $\frac{3}{4}$ inch diameter puddle welds at a maximum spacing across the width of the panel of 8 inches or every low corrugation.
 - 3. Intermediate supports - same as (2) above.
 - 4. Where two panels abut, each panel shall be fastened as in (2) above.
 - 5. Longitudinal edges and edge laps supported by steel framework - $\frac{3}{4}$ inch diameter puddle welds at a maximum spacing of 12 inches along the length of the panel.
 - 6. See Drawings for additional requirements in special areas.
- E. Longitudinal side laps of adjacent panels:
 - 1. Deck shall be welded or mechanically fastened between supports at intervals not exceeding 24 inches or as noted on the plans.
- F. Longitudinal edge closures shall be fastened by tack welding at a maximum spacing of 2 feet. Sheet metal screws shall not be used.

3.4 FIELD QUALITY CONTROL

- A. Welding fabrication, materials, and workmanship shall be subjected to inspection and testing during the erection and installation process.
- B. Nondestructive testing of erection, installation and fabrication welds will be conducted by an independent Testing Agency, retained by the Owner, in accordance with the weld inspection criteria specified below.

- C. The Contractor shall facilitate inspection and testing by the Testing Agency. Furnish the Testing Agency, upon request, with the following:
 - 1. Complete sets of approved shop drawings and corrective work procedures at shop(s) and in the field.
 - 2. Cutting lists, order lists, material bills and shipping lists.
 - 3. Information as to time and place of all rollings and shipment of materials to the shop(s) and the field.
 - 4. Full and ample means and assistance for testing, including access to all field and shop welds required to be tested.
- D. Notify the Engineer prior to the start of any erection or installation or other phases of the work to afford reasonable opportunity to inspect the work.
- E. Maintain inspection and quality control records of field work.

3.5 NONDESTRUCTIVE WELD TESTING REQUIREMENTS

- A. Weld Inspection Criteria:
 - 1. Selection of Welds to be Tested: As agreed upon between Engineer and Contractor.
 - 2. Unless otherwise specified, perform NDT of welds at a spot testing frequency as determined in the attached table in Data Sheet 05050 – A, in accordance with the referenced welding codes, as follows:
 - a. Fillet Welds: A randomly sampled percentage of all fillet welds to be provided shall be examined and repaired, using either dye penetrant or magnetic particle inspection methods.
 - b. All Welds: 100 percent visually inspected.
 - 3. Weld Acceptance:
 - a. Visual Inspection (VT):
 - 1) All Structural Steel: AWS D1.1, paragraph 6.9, Visual Inspection, Statically Loaded Nontubular Connections.
 - b. Magnetic Particle (MT):
 - 1) Perform on fillet and partial penetration groove welds in accordance with AWS D1.1, paragraph 6.10.
 - 2) Acceptance shall be in accordance with VT standards specified above.
 - c. Liquid Penetrant (PT):
 - 1) Perform on fillet and partial penetration groove welds per AWS D1.1, paragraph 6.10.
 - 2) Acceptance shall be in accordance with VT standards specified above.

3.6 WELD DEFECT REPAIR

- A. Deficient welds shall be cut out to sound material and rewelded.
- B. Verify by retesting that rejected weld defects have been repaired and are acceptable in accordance with the appropriate welding codes.

3.7 SUPPLEMENTS

- A. The supplements listed below, following “END OF SECTION,” are a part of this Specification.
 - 1. DATA SHEET 05050 – A , Welding and Nondestructive Testing Requirements.

END OF SECTION

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DATA SHEET 05050-A

Welding and Nondestructive Testing Requirements

Specification Section	Governing Welding Codes or Standards	Submit Welding Procedure Spec.	Submit Welder/ Welding Operator Qual.	Onsite Welding Inspector Req'd	Submit Written Nondestructive Testing Procedure Specifications	Nondestructive Testing Requirements
05 12 00 Structural Steel	AWS D1.1, Structural Welding Code-Steel	Yes	Yes	Yes	Yes	10% MT ³ or PT ⁴ of all fillet welds; see Section 051200
05 30 00 Metal Decking	AWS D1.1, Structural Welding Code-Steel or AWS D1.3, Structural Welding Code-Sheet Steel	Yes	No	Yes	No	100% VT ⁵ ; see Section 053000

¹UT-Ultrasonic Testing.

²RT-Radiographic Testing.

³MT-Magnetic Particle Testing.

⁴PT-Liquid Dye Penetrant Testing.

⁵VT-Visual Testing

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SECTION 05 30 00

METAL DECKING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Metal form deck.
 - 2. Closures and Fillers.
- B. Related Sections
 - 1. Section 05 05 00 - Welding.
 - 2. Section 09 90 00 – Painting and Coating.
- C. Alternates
 - 1. Substitutions for metal deck sizes, type, connection details or any other modifications proposed by the Contractor will be considered by the Engineer only under the following conditions:
 - a. That the request has been made and accepted prior to submission of Shop Drawings.
 - b. That there is a substantial cost advantage or time advantage to the Owner; or that the proposed revision is necessary to obtain required materials or methods at proper times to accomplish the work in the time scheduled.
 - c. That sufficient sketches, engineering calculations, and other data have been submitted to facilitate checking by the Engineer, including cost reductions or savings in time to complete work.
 - d. That the cost of reviewing the substitutions shall be borne entirely by the Contractor.

1.2 REFERENCES

- A. American Institute of Steel Construction (AISC), “Specifications for Structural Steel Buildings”.
- B. ASTM A36 – Standard Specification for Structural Steel.
- C. ASTM A611 – Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Structural Quality.
- D. ASTM A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-iron Alloy coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- F. ASTM A924 – Standard Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot Dipped Process.
- G. Steel Deck Institute (SDI) – Code of Recommended Standard Practice.

H. Underwriter's Laboratories (UL) – Fire Resistance Directory.

1.3 SUBMITTALS

- A. Product Data: Descriptive literature of the metal deck materials and products to be provided.
 - 1. Metal deck type, gauge, and finish.
 - 2. Load and deflection ratings.
- B. Quality Control Submittals:
 - 1. Manufacturer's instructions for handling and installation.
 - 2. Welding Procedures, Qualifications, Inspection Reports and manufacturer's certification of filler metal for welding, as specified in Section 05050.
 - 3. Verification of the manufacturer's membership in the Steel Deck Institute, when requested by the Engineer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Handle and stack materials carefully in order to prevent corrosion, deformation, or damage.
- B. During unloading and hoisting, take care to prevent damage to ends and sides of individual deck panels.
- C. Panels stored prior to installation shall be placed on skids and shall be protected, with one end elevated to provide drainage.
- D. Stored panels shall be kept dry, protected from the weather with a ventilated waterproof covering.
- E. Foreign materials on panels shall be completely removed prior to erection.
- F. Monitor the tightness of decking bundles. Re-tighten as necessary to prevent wind from loosening sheets.
- G. Deck bundles stored on the building framing shall be placed near a main support beam or column. Do not place bundles on unbolted frames or unattached or unbridged joists. Ensure that the structure frame is properly braced to receive the bundles.

1.5 SEQUENCING AND SCHEDULING

- A. Erect metal deck only after the supporting structural steel has been aligned and connected as required by the Structural Drawings and Specifications.

PART 2 PRODUCTS

2.1 GENERAL

- A. Metal deck products shall be certified by the Steel Deck Institute.
- B. All deck shall be fabricated with an interlocking side-lap that provides a horizontal leg on both longitudinal edges of sufficient length for installing fasteners.
- C. Metal deck panels shall be shipped to the field cut to the proper length.
- D. Fabricate all materials in accordance with the approved shop drawings.

2.2 MANUFACTURERS

- A. Canam / United Steel Deck.
- B. Vulcraft Steel Deck.
- C. Wheeling Corrugating Co.
- D. or equal.

2.3 MATERIALS

- A. Metal Form Deck
 - 1. Fabricated from steel with a minimum yield strength of 33,000 psi. Working stress shall not exceed 20,000 psi.
 - 2. Deflection under design live load shall not exceed 1/240 of the span.
 - 3. Galvanized steel metal form deck shall conform to ASTM A653, grade 33.

2.4 DECK ACCESSORIES:

- A. Fabricate deck accessories of 18-gauge minimum sheet steel, with a galvanized or painted coating the same as provided on the main deck sheets. Provide the following typical accessories, and any additional accessories required by the deck manufacturer's metal deck system, to provide continuous support for the concrete and to prevent loss of concrete fines through gaps and openings.
 - 1. Cover plates or flashing plates as required to close panel edge or end conditions, and where panels change direction or abut.
 - 2. Horizontal flashing to close openings between the metal deck and structural steel columns.
 - 3. Horizontal flashing to cover gaps between deck and structural steel or between deck units.
 - 4. Edge closures and screeds to provide boundary for concrete cast on metal deck. Unless a structural steel member is the edge form, provide edge forms at slab perimeter and at openings in slabs cast on metal deck. Edge closures and forms shall have (or shall be braced to have) sufficient strength and stiffness to retain the concrete with straight edges true to drawing details and dimensions.
- B. Prime paint for touch-up: By the same manufacturer as the shop prime paint, in accordance with the requirements of Section 09 90 00.
- C. Galvanized coating repair materials: Touch up materials meeting the requirements of ASTM A780.
- D. Welding material: In accordance with the requirements of Section 05 05 00. Welding washers shall be required for metal deck lighter than 22 gauge, or as otherwise recommended by the metal deck manufacturer.
- E. Auxiliary Structural Steel:
 - 1. Steel shapes and plates shall be new steel conforming to ASTM A36.
 - 2. Fabrication shall conform to AISC Specification.

2.5 FINISHES

A. Metal Form Deck

1. Galvanized in accordance with ASTM A924, with a minimum coating class of G60 as defined in ASTM A653, and then cleaned, phosphatized and coated with a shop coat of prime paint. Prime paint shall comply with the requirements of Section 09 90 00. Surfaces to come in contact with concrete shall not be painted.

2.6 SOURCE QUALITY CONTROL

- A. Materials and workmanship shall be subjected to inspection and testing in shop and field by the Engineer and/or Testing Agency. Such inspection and testing shall not relieve the Contractor of the responsibility to provide additional inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of Contract Documents.
- B. Notify the Engineer and Testing Agency prior to start of any fabrication, erection, or other phases of work so as to afford them reasonable opportunity to inspect work.
- C. Facilitate inspection and testing by Testing Agency. Furnish Testing Agency, upon request, with:
 1. Complete sets of approved Shop Drawings and corrective work procedures at shop(s) and in field.
 2. Cutting lists, order lists, material bills, and shipping lists.
 3. Information as to time and place of all rollings and shipments of material to shop(s) and field.
 4. Representative sample pieces requested for testing.
 5. Full and ample means and assistance for testing materials, and proper facilities for inspection of work, shop and field.
- D. Welding certification and qualification records, as required by Section 05 05 00, shall be available for examination by the Engineer and/or Testing Agency, or certified copies submitted upon request to the Engineer and Testing Agency.
- E. Do not remove any marks or tags applied by Testing Agency identifying rejected work.
- F. Metal deck work, which has been rejected by the Engineer and/or Testing Agency in shop or field, shall be corrected without delay and at no expense to the Owner.
- G. If arrangements for corrections and/or replacements are not made within seven days after notice of rejection, the Owner shall have the right to have corrections and/or replacement made at no additional cost.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine all work prepared by others to receive work of this Section and report any defects affecting installation to Contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.

3.2 INSTALLATION

- A. Install all components in accordance with the Contract Documents, the approved Shop Drawings, and the SDI “Code of Recommended Standard Practice”.
- B. Auxiliary Steel Supports
 - 1. Auxiliary steel supports shall be provided at all openings as required by the standard details as shown on the drawings.
 - 2. Erect auxiliary steel supports in accordance with provisions of Section 05 12 00, of the Specifications, and in conformance with the approved Shop Drawings.
 - 3. Bearing surface of each auxiliary support shall be in the plane of the bottom of the deck, as established by adjacent structural steel members on which the deck is to bear.
- C. Metal Deck
 - 1. All notching at columns, bevel cuts, or other similar fabrication shall be done by the metal deck erector.
 - 2. No opening shall be cut in metal deck unless shown on the approved metal deck Shop Drawing or specifically approved by the Engineer in writing. If an opening not shown on the Shop Drawings is required, Contractor shall submit to the Engineer a sketch drawn to scale, showing the proposed opening and all other openings and supports in the immediate area. The deck shall not be cut until the Engineer has approved this sketch. Any additional reinforcement or framing required because of such an opening shall be provided at no additional cost to the Owner.
 - 3. The metal deck erector shall cut all holes and openings which are located and dimensioned on the Structural Drawings. Holes required by other trades shall be shown on the metal deck Shop Drawings, but shall be located and cut by the respective trades.
 - 4. All cutting of metal deck panels shall be done in a workmanlike fashion by power shears, gas-torch, cold chisel or other means approved by the Engineer.
 - 5. Metal deck support surfaces, which are to receive welding, shall be free of paint, ice, water, oil, dirt, rust or any other material detrimental to welding.
 - 6. Metal deck panels shall not be installed until the temporary shoring, where required, has been installed.
 - 7. No metal deck shall be erected until the corresponding structural steel tier has been fully aligned and connected. If the supporting steel framework is not in proper alignment, or at the proper level, proceed with corrective action. The metal deck panels shall not be erected until the necessary corrections have been made.
 - 8. Metal deck panels shall be placed on supporting steel, masonry or concrete and accurately aligned to final position before being permanently fastened. Deck shall not be stretched or contracted in a transverse direction and shall have a minimum end bearing of 2 inches on the supporting steel or concrete. Metal deck panels shall rest tightly on the top flange of beams or girders, or any other support surfaces. Unless indicated otherwise, all steel beams in floor areas where metal deck is used shall have their top flanges in direct contact with and welded to the deck, for lateral stability of the beams.

9. Do not impose construction loads that exceed the load carrying capacity of the deck.
10. Install sheet steel accessories welded in place, including closures, or cover plates, as appropriate, where panels change direction or abut, to bridge edges of panels to adjacent steel, and at other locations where shown or otherwise required to support the roof deck.
11. All welding of metal deck panels, including accessories, shall be in accordance with the requirements of Section 05 05 00.
12. Both welding to bottom of metal deck and field penetration through metal deck for hangers or hanger attachment devices are prohibited, unless specifically approved in advance by the Engineer, or shown on the Structural Drawings. The Engineer will not consider any hanger or attachment device proposal which in the Engineer's opinion would impair the local or overall load capacity of the deck-slab system, or would impair the fire resistance of the deck-slab assembly, or would result in a concentrated suspended load on the deck exceeding 100 pounds at any single location, or would result in a total suspended load on the deck-slab system exceeding 600 pounds in any area 40 square feet.

3.3 REPAIR AND RESTORATION

- A. Replace damaged components with identical new units, unless the Engineer specifically permits repair or reinforcement.
- B. All galvanized metal form deck shall be spot repaired where coatings are damaged by welding, prior to covering the decking with roofing materials.

3.4 FIELD QUALITY CONTROL

- A. Welding inspection and testing shall be in accordance with Section 05050.

END OF SECTION

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SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. SECTION INCLUDES

1. Plywood sheathing
2. Wood nailers and blocking

1.2 REFERENCES

- A. The Connecticut State Building Code, latest edition
- B. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- C. ASTM D1761 - Testing Mechanical Fasteners in Wood
- D. AWWA Analytical Standards: A2, A3, A9, A16, A17, A18
- E. AWWA U1 Use Category System: User Specification for Treated Wood
- F. Inspection Agencies - Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

ALSA - American Lumber Standards Committee: Softwood Lumber Standards

APA - American Plywood Association

NFPA - National Forest Products Association

RIS - Redwood Inspection Service

NELMA – Northeastern Lumber Manufacturers Association

NLGA - National Lumber Grades Authority (Canadian)

SPIB - Southern Pine Inspection Bureau

WCLIB - West Coast Lumber Inspection Bureau

WWPA - Western Wood Products Association

1.3 DEFINITIONS

- A. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

1.4 SUBMITTALS

- A. Submit chemical treatment manufacturer's instructions for handling, storing, installation and finishing of treated material.
 - 1. For each type of pressure treatment specified, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained and conformance with applicable standards.
 - 2. For water-borne treatment, include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.
 - 3. Evaluation Report:
 - a. ICC-ES ESR-2644
 - 4. Warranty documents
- B. Manufacturer's literature for all metal connectors and framing anchors
- C. Wood-preservative-treatment data from chemical treatment manufacturer. Include certification of chemical solution and affirm that it complies with indicated treatment standard.

1.5 QUALITY ASSURANCE

- A. Design standards shall conform to applicable provisions of NFPA Specification.
- B. Source: For each material type required for the work of this section, provide primary materials that are the product of one manufacturer. Provide secondary or accessory materials that are acceptable to the manufacturers of the primary materials.
 - 1. Alkaline copper quaternary (ACQ) preservative-treated wood products from a single approved source.
 - 2. Wood Treatment Plant Qualifications: Wood treatment plant experienced in performing work of this section which has specialized in the treatment of wood similar to that required for this project, licensed by the manufacturer.
- C. Installer: A firm with a minimum of three years experience in type of work required by this section.
- D. Regulatory Requirements: Provide preservative treatment that complies with the following regulatory requirements:
 - 1. ICC-ES ESR-2644
- E. Quality Mark: All ACQ preservative-treated wood members shall bear an end tag or permanent ink stamp indicating the following:
 - 1. Name of wood treating company
 - 2. Treatment plant city and state
 - 3. Symbol for alkaline copper quaternary (ACQ)
 - 4. Preservative retention level
 - 5. Approved use

6. Code report number

1.6 TESTING AND INSPECTION

A. Materials and workmanship under this Section may be subject to inspection in the field by the Engineer or by qualified inspectors selected by the Engineer and paid directly by the Owner.

1.7 DELIVERY, STORAGE AND HANDLING

A. Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

1. For lumber treated with waterborne chemicals, sticker between each course to provide air circulation.

1.8 PROJECT CONDITIONS

A. Coordination - Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of nailers, blocking, grounds and similar supports to allow attachment of other work.

PART 2 PRODUCTS

2.1 GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

1. Grade Stamps - Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing and mill.

a. Apply grade stamps to ends or back of each piece, or omit grade stamps entirely and issue certificate of grade compliance from inspection agency in lieu of grade stamp.

2. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.

a. Provide dressed lumber, S4S, unless otherwise indicated.

b. Provide lumber with 19% maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

3. Wood nailers for roof shall conform to Factory Mutual's Loss Prevention Data Sheet 1-49.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative treatment by pressure process: AWWA U1.
 - 1. Preservative chemicals: Alkaline Copper Quaternary (ACQ).
 - 2. Use categories:
 - a. AWWA U1-UC2: Interior, potentially damp applications, such as:
 - 1) Nailers and blocking to support roof edge metal, curbs, and equipment supports.
- B. End Cut Preservative: Treat cut ends in accordance with manufacturer's recommendations.
- C. Adhesive: Use adhesives in accordance with manufacturer's recommendations.
- D. Kiln-dry preservative treated lumber and plywood panel material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- E. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- F. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Southern Yellow Pine No. 2 or better per SPIB rules

2.3 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated. No. 2 grade and any of the following species:
 - 1. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA
 - 2. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA
 - 3. Western woods; WCLIB or WWPA

2.4 MISCELLANEOUS LUMBER

- A. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
 - 1. Hem-fir or Hem-fir (north), No. 2 Common grade; NLGA, WCLIB, or WWPA
 - 2. Spruce-pine-fir (south) or Spruce-pine-fir, No. 2 Common grade; NELMA, NLGA, WCLIB, or WWPA
 - 3. Eastern softwoods, No. 2 Common grade; NELMA

4. Northern species, No. 2 Common grade; NLGA
5. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture and compatible with the pressure treatment chemicals.
 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667
- C. Power-Driven Fasteners: CABO NER-272
- D. Wood Screws: ASME B18.6.1
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- H. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.6 PLYWOOD

- A. Exterior vertical sheathing shall be APA rated pressure treated, exterior, grade C-D, 1/2 inch thick plywood.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Take all necessary field measurements before fabrication. Do not delay progress of the job. If field measurements are not possible prior to fabrication, allow for field cutting and fitting.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Cutting, framing and fitting shall be done as necessary for the accommodation of other work. The use of wood chips, shims, or other shrinkable material for leveling will not be permitted. Holes shall be bored accurately for bolts and as required to prevent splitting wood. Bolts shall be drawn up tight.

- E. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- F. Apply field treatment complying with AWP A M4 to cut surfaces of preservative-treated lumber and plywood.
- G. Select pressure treated members in accordance with appropriate untreated lumber and plywood span tables. Provide ventilation of building cavities as required by code.
- H. Install pressure treated wood in accordance with requirements of applicable codes. Avoid milling operations that could adversely affect preservative characteristics of ACQ treated wood.
- I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Connecticut State Building Code, most recent edition
 - 2. ICC-ES ESR-1539 for power-driven fasteners
 - 3. Published requirements of metal framing anchor manufacturer
 - 4. Table 2304.9.1, "Fastening Schedule," in the ICC International Building Code
 - 5. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in the International One- and Two-Family Dwelling Code
- J. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD FURRING, GROUNDS, NAILERS, AND BLOCKING

- A. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate location with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
- C. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- D. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- E. Install treated wood nailers, blocking and plywood at locations indicated on Drawings.
- F. Install continuous wood nailers at the perimeter of the entire roof and around roof projections and penetrations as shown on the Drawings.
- G. Contractor shall conduct pullout tests prior to start of nailer, blocking and plywood installation.
- H. Nailers shall be anchored to resist a minimum force of 300 pounds per lineal foot in any direction. A 1/2 inch space shall be provided between nailer lengths. Individual nailer lengths shall not be less than 3 feet long. Nailer fastener spacing shall not exceed 12 inches on center. Fasteners shall be staggered 1/3 the nailer width and installed within

6 inches of each end. Nailer attachment shall meet this requirement and that of the current Factory Mutual Loss Prevention Data Sheet 1-49.

- I. Thickness of nailers and woodwork shall be as indicated on Drawings to match substrate or insulation height to allow smooth transition.
- J. Wood nailers and woodwork are generally indicated in nominal lumber sizes, where required, whether indicated or not, the roofing contractor shall furnish, ripped, continuous, plywood shims to create nailer heights to match conditions.

3.3 PLYWOOD

- A. General: Comply with applicable recommendations contained in APA Form No. E30, "Engineered Wood Construction Guide" for types of structural-use panels and applications indicated.
- B. Comply with "Code Plus" provisions in above-referenced guide.

3.4 FRAMING

- A. Sheathings shall be of the sizes shown on the Drawings and shall be secured perpendicular to the framing members with ends staggered as follows or in accordance with local building codes, whichever is more stringent.
 - 1. Vertical sheathing shall be fastened using 8d common nails spaced 4 inches o.c. along all supported panel edges and 12 inches on center for interior supports.
- B. Set structural members level and plumb, in correct position.

3.5 ROOF TRUSSES

- A. The wood trusses shall be installed in accordance with the manufacturer's instructions.
- B. Trusses must be securely braced both during erection and after permanent installation in accordance with "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses (DSB-89)" published by the Truss Plate Institute, Inc. The members shall be set level and plumb and in correct position. Erection bracing shall be used to maintain them straight and plumb until decking and permanent truss bracing has been fastened forming a structurally sound roof framing system. Erection and permanent bracing shall be installed and securely fastened before application of any load.
- C. Handling and installation shall follow the "Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses (BCSI 2008)" by TPI.
- D. Attach trusses with an 18-gage minimum hurricane connector plate to the top plate at both ends of each truss, unless other connection is required by Drawings.

3.6 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

END OF SECTION

SECTION 07 22 00

ROOF AND DECK INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof and deck insulation, substrate board, vapor retarder and cover board on existing construction ready to receive roofing.
2. Repairs and alteration work to existing roof insulation.

B. Related Sections:

1. Section 06 10 00 - Rough Carpentry
2. Section 07 53 00 - EPDM Sheet Roofing
3. Section 07 62 00 - Sheet Metal Flashing and Trim
4. Section 07 72 00 - Roof Accessories

1.2 REFERENCES

A. The Connecticut State Building Code, Latest Edition.

B. ASTM International (ASTM):

1. C208 Cellulosic Fiber Insulating Board
2. C726 Mineral Fiber Roof Insulation Board
3. C728 Perlite Thermal Insulation Board
4. C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
5. C1278 Standard Specification for Fiber-Reinforced Gypsum Panel
6. C1289 Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
7. C1396 Standard Specification for Gypsum Board
8. D41 Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
9. D312 Asphalt Used in Roofing
10. D1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
11. D2178 Asphalt Glass Felt Used in Roofing and Waterproofing
12. D2822 Asphalt Roof Cement

13. D4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free
 14. E84 Standard Test Method for Surface Burning Characteristics of Building Material
 15. F1667 Driven Fasteners: Nails, Spikes, and Staples
- C. National Roofing Contractors Association:
1. Manual 15 The NRCA Roofing Manual: Membrane Roof Systems
- D. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory
- E. U.S. Department of Commerce National Institute of Standards and Technology (NIST):
1. DOC PS 1 U.S. Product Standard for Construction and Industrial Plywood

1.3 PERFORMANCE REQUIREMENTS

- A. Thermal Performance: Provide roof insulation meeting minimum R-value of 30.
- B. Fire and Wind Uplift Resistance: Provide roof insulation complying with requirements specified in Division 07 roofing section.
- C. Insulation on Combustible or Metal Decking: UL labeled indicating compliance with one of the following:
1. UL Listed.
 2. Insulation Surface Burning Characteristics: When tested according to ASTM E84:
 - a. Flame Spread Rating: 75 maximum.
 - b. Smoke Developed Rating: 150 maximum.

1.4 QUALITY CONTROL

- A. Installer Qualifications: Same installer as Division 07 roofing section installer.
- B. Unless specified otherwise, comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to insulation for storage, handling, and application.

1.5 SUBMITTALS

- A. The insulation manufacturer shall send, in writing to the Engineer and single-ply manufacturer, a copy of their recommendations for use of their product, including:
1. Name of specific project
 2. Recommended procedures for attachment of insulation to deck, including quantity, density, and/or spacing.
 3. Recommended procedures for adhering single ply roofing to insulation or cover board.

4. Statements which express warranty conditions for the successful performance of their insulation for the duration of the single ply manufacturer's warranty.
 - B. Product Data - Submit manufacturer's product literature and installation instructions for each type of insulation, cover board and air retarder material required.
 1. Where insulation is to be adhered to deck or base sheet, product data for adhesive must include VOC content data showing compliance with Part 2.1 A 2 of this Section.
 - C. Shop Drawings - Include plans, sections, details, and attachments.
 1. Board by board layout of any tapered system, complying with the drainage pattern required.
 2. Complete board layout of all insulation components, thicknesses, and the minimum "R" value of the completed insulation system.
 3. Nailers, cants, and terminations.
 4. Layout showing slopes, tapers, penetration, and edge conditions.
 - D. Samples:
 1. Roof insulation, each type.
 2. Nails and fasteners, each type.
 - E. Certificates:
 1. Indicating type, thermal conductance, and minimum and average thickness of insulation.
 2. Indicating materials and method of application of insulation system meet the requirements of FM Approvals for specified roofing system.
 - F. Laboratory Test Reports: Thermal values of insulation products.
 - G. Documentation of supervisors' and inspectors' qualifications.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: Same installer as Division 07 roofing section installer.
- 1.7 DELIVERY
- A. Comply with recommendations of NRCA Manual.
 - B. Deliver products in manufacturer's original sealed packaging.
 - C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, and manufacture date.
 - D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.
- 1.8 STORAGE AND HANDLING
- A. Comply with recommendations of NRCA Manual.

- B. Store products indoors in dry, weathertight facility.
- C. Protect products from damage during handling and construction operations.

1.9 WARRANTY

- A. Manufacturer's Warranty: Warrant substrate board, vapor retarder, insulation, and cover board against material and manufacturing defects as part of Division 07 roofing system warranty.

PART 2 PRODUCTS

2.1 ADHESIVE MATERIALS

- A. Adhesive Materials, General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use, identical to materials utilized in approved listed roofing system, and compatible with roofing membrane.
 - 1. Liquid-type adhesive materials shall comply with VOC limits of authorities having jurisdiction.
 - 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Multipurpose Construction Adhesives: 70 g/L.
 - c. Fiberglass Adhesives: 80 g/L.
 - d. Contact Adhesives: 80 g/L.
 - e. Other Adhesives: 250 g/L.
 - f. Nonmembrane Roof Sealants: 300 g/L.
 - g. Sealant Primers for Nonporous Substrates: 250 g/L.
 - h. Sealant Primers for Porous Substrates: 775 g/L.
- B. Primer: ASTM D41.
- C. Asphalt: ASTM D312, Type III or IV for vapor retarders and insulation.
- D. Modified Asphaltic Insulation Adhesive: Insulation manufacturer's recommended modified asphaltic, asbestos-free, cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- E. Bead-Applied Urethane Insulation Adhesive: Insulation manufacturer's recommended bead-applied, low-rise, one- or multicomponent urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- F. Full-Spread Applied Urethane Insulation Adhesive: Insulation manufacturer's recommended spray-applied, low-rise, two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

- G. Roof Cement: Asbestos free, ASTM D2822, Type I or Type II; or, D4586, Type I or Type II.

2.2 ROOF AND DECK INSULATION

- A. Roof and Deck Insulation, General: Preformed roof insulation boards approved by roofing manufacturer.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
- C. Perlite Board Insulation: ASTM C728, expanded perlite, cellulosic fibers, binders, and waterproofing agents with top surface seal coated.
- D. Tapered Roof Insulation System:
 - 1. Fabricate of mineral fiberboard, polyisocyanurate, or perlite board. Use only one insulation material for tapered sections. Use only factory-tapered insulation.
 - 2. Cut to provide high and low points with crickets and slopes as shown.
 - 3. Minimum thickness of tapered sections; 1-1/2 inch.
 - 4. Minimum slope 1:48 (1/4 inch per 12 inches).
- E. Composite Nail Base Insulated Roof Sheathing:
 - 1. Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: polyisocyanurate thermal insulation ASTM C1289, Type V, insulation thickness as indicated, with oriented strand board laminated to top surface.
 - 2. Oriented Strand Board: NIST DOC PS 1, Exposure 1, 5/8 inch thick.
 - 3. Bottom surface faced with felt facers.

2.3 INSULATION ACCESSORIES

- A. Glass (Felt): ASTM D2178, Type VI, heavy duty ply sheet.
- B. Cants and Tapered Edge Strips:
 - 1. Wood Cant Strips: Refer to Section 06 10 00 - Rough Carpentry.
 - 2. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.
 - 3. Tapered Edge Strips: 1:12 (one inch per foot), from 0 inches, 12 inches to 18 inches wide.
 - a. Cellulosic Fiberboard: ASTM C208.
 - b. Mineral Fiberboard: ASTM C726.
 - c. Perlite Board: ASTM C728.

- C. Vapor Retarder:
 - 1. Glass-Fiber Felts: ASTM D2178, Type IV, asphalt impregnated.
 - 2. Self-Adhering Sheet Vapor Retarder: ASTM D1970, minimum of 40-mil-thick, polyethylene film laminated to layer of rubberized asphalt adhesive, or 30- to 40-mil- thick, polyethylene film laminated to layer of butyl rubber adhesive; maximum permeance rating of 0.1 perm.
- D. Substrate Board:
 - 1. Gypsum Board: ASTM C1396 5/8-inch-thick, Type X.
 - 2. Glass Mat, Water Resistant Gypsum Roof Board: ASTM C1177, Type X, 5/8-inch-thick, factory primed
 - 3. Cellulosic Fiber Reinforced, Water Resistant Gypsum Roof Board: ASTM C1278, 5/8 inch thick.
 - 4. Perlite Board Insulation: ASTM C728, 1 inch thick.
- E. Cover Board:
 - 1. Glass Mat, Water Resistant Gypsum Roof Board: ASTM C1177, 5/8-inch-thick, factory primed.
 - 2. Cellulosic-fiber insulation board, ASTM C208, Type II, Grade 2, ½-inch-thick.

2.4 FASTENERS

- A. Fasteners: Corrosion-resistant carbon steel fasteners and galvalume-coated steel or plastic round plates for fastening substrate board and insulation to roof deck
- B. Nails: ASTM F1667; type to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Comply with requirements of Division 07 roofing section.

3.2 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.

3.3 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for consideration.
- B. The building and its contents shall be protected against all risks, and any damages shall be repaired or replaced. All exterior building and ground areas shall be protected from damage.

- C. Comply with requirements of UL for insulated steel roof deck.
- D. Attach substrate board and other products to meet requirements of Division 07 roofing section.

3.4 SUBSTRATE BOARD INSTALLATION

- A. Fasten substrate board to top flanges of steel decking to resist uplift pressures according to requirements for specified roofing system.
 - 1. Locate the long dimension edge joints solidly bearing on top of decking ribs.

3.5 VAPOR RETARDER INSTALLATION

- A. General:
 - 1. Install continuous vapor retarder on roof decks where indicated.
 - 2. At vertical surfaces, turn up vapor retarder to top of insulation or base flashing.
 - 3. At all pipes, walls, and similar penetrations through vapor retarder, seal openings with roof cement to prevent moisture entry from below.
 - 4. Seal penetrations with roof cement.
- B. Cast in Place Concrete Decks, Except Insulating Concrete:
 - 1. Prime deck as specified.
 - 2. Apply two plies of asphalt saturated felt mopped down to deck.
- C. Precast Concrete Unit Decks Without Concrete Topping:
 - 1. Prime deck as specified.
 - 2. Apply two plies of asphalt saturated felt.
 - 3. Mop to deck, keeping bitumen 100 mm (four inches) away from joints of precast units. Bridge joints with felt. Mop between plies as specified.

3.6 RIGID INSULATION INSTALLATION

- A. Insulation Installation, General:
 - 1. Install roof insulation in accordance with roofing system manufacturer's written instructions.
 - 2. Base Sheet: Where required by roofing system, install one lapped base sheet specified in Division 07 roofing section by mechanically fastening to roofing substrate prior to installation of insulation.
 - 3. Cant Strips: Install cant strips at junctures of roofing system with vertical construction. Use wood cant strips where required to receive fasteners.
 - 4. Use same insulation as existing for roof repair and alterations unless specified otherwise.

- B. Insulation Thickness:
1. Thickness of roof insulation shown on drawings is nominal. Actual thickness shall provide the thermal resistance "R" value of not less than that specified in Performance Requirements section of this specification.
 2. Insulation on Metal Decks: Provide minimum thickness of insulation for metal decks recommended by the insulation manufacturer to span rib opening (flute size) of metal deck used. Support edges of insulation on metal deck ribs.
 3. When thickness of insulation to be used is more or less than that shown on the drawings, make adjustments in the alignment and location of roof drains, flashing, gravel stops, fascias and similar items at no additional cost to the Owner.
 4. Where tapered insulation is used, the thickness of the insulation at high points and roof edges shall be as shown on the drawings; the thickness at the low point (drains) shall be not less than 3½ inches.
 5. Use not less than two layers of insulation when insulation is 2.5 inch or more in thickness unless specified otherwise.
- C. Lay insulating units with close joints, in regular courses and with cross joints broken.
1. Stagger joints between layers minimum 12 inches.
- D. Lay units with long dimension perpendicular to the rolled (longitudinal) direction of the roofing felt.
- E. Lay out tapered insulation in accordance with the approved shop drawings.
- F. Seal cut edges at penetrations and at edges against blocking with bitumen or roof cement.
- G. Cut to fit tight against blocking or penetrations.
- H. Cover all insulation installed on the same day; comply with temporary protection requirements of Division 07 roofing section. Do not install more insulation board than can be covered with approved membrane by the end of the day or the onset of inclement weather.
- I. Installation Method:
1. Adhered Insulation:
 - a. Prime substrate as required.
 - b. Set each layer of insulation firmly in ribbons of bead-applied insulation adhesive or in uniform application of full-spread insulation adhesive, as applicable for proposed roofing assembly. When applied in beads, bead spacing shall be as required by the roofing manufacturer's warranty requirements. Apply adhesive bead so that the distance from the edge of the board does not exceed half the required bead spacing.

- c. Walk the boards into the adhesive and roll using a 30" wide, 100-150 pound steel roller to ensure full embedment. Hold the insulation boards in place with weights until the adhesive has set.
- 2. Mechanically Fastened Insulation:
 - a. Fasten insulation according to requirements in Division 07 roofing section.
 - b. Fasten insulation to resist uplift pressures specified in Division 07 roofing section.
- 3. Mechanically Fastened and Adhered Insulation:
 - a. Fasten first layer of insulation according to "Mechanically Fastened Insulation" requirements.
 - b. Fasten each subsequent layer of insulation according to "Adhered Insulation" requirements.

3.7 COVER BOARD INSTALLATION

- 1. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- 2. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board. Fill gaps exceeding 1/4 inch with cover board.
 - a. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations
- 3. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 - a. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- 4. Install cover boards over insulation with long joints in continuous straight lines with staggered end joints.
- 5. Offset cover board joints from insulation joints minimum 6 inches, minimum.
- 6. Adhered Cover Board: Adhere cover board to substrate as follows:
 - a. Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.8 PROTECTION

- A. General - Protect installed insulation from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

SECTION 07 53 00

EPDM SHEET ROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Work Includes

1. All demolition required to facilitate the installation of the new roofing system.
2. Installation of a fully adhered roofing membrane with flashings, and other items required by the roofing manufacturer to comprise a total roofing system, backed by a 20-year system warranty that is all inclusive and covers all components. Warranty shall not be pro-rated.
3. Containment and cleanup of debris generated by any work of this project, sufficient to prevent debris from entering the interior of the building, any roof drains, or the exterior of the building.
4. The Work includes but is not necessarily limited to the installation of:
 - a. Vapor barrier
 - b. Fiberglass Reinforced Gypsum Sheeting
 - c. Insulation
 - d. Fasteners
 - e. Roof membrane
 - f. Roof membrane flashings
 - g. Curbs, framing and other items indicated on the Drawings
 - h. Walkways
 - i. Metal flashings
 - j. Sealants and adhesives
 - k. Wood blocking
 - l. Cover Board

B. RELATED SECTIONS

1. Section 06 10 00 - Rough Carpentry
2. Section 07 22 00 - Roof and Deck Insulation
3. Section 07 62 00 - Sheet Metal Flashing and Trim
4. Section 07 70 00 - Roof Accessories

1.2 REFERENCES

- A. The Connecticut State Building Code, Latest Edition.
- B. American Society for Testing and Materials (ASTM):
 - A167 Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
 - B209 Aluminum and Aluminum-Alloy Sheet and Plate
 - D751 Testing Coated Fabrics
 - D2103 Polyethylene Film and Sheeting
 - D2240 Rubber Property - Durometer Hardness
 - D3884 Abrasive Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)
 - D4637 Vulcanized Rubber Sheet Used in Single-Ply Roof Membrane
 - D4586 Asphalt Roof Cement, Asbestos Free
 - E96 Water Vapor Transmission of Materials
 - E108 Fire Tests of Roof Coverings
- C. American National Standards Institute (ANSI)
 - 1. ANSI/FM 4474-2004 (R2010) – American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures
- D. Underwriter Laboratories (UL)
 - 1. UL 790 – Standard Test Methods for Fire Tests of Roof Coverings.
- E. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) – (latest issue)
- F. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue)
- G. National Roofing Contractors Association (NRCA)
 - 1. Roofing and Waterproofing Manual

1.3 SUBMITTALS

- A. The insulation manufacturer shall send, in writing to the Engineer and single-ply manufacturer, a copy of their recommendations for use of his product, including:
 - a. Name of specific project
 - b. Recommended procedures for attachment of insulation to deck, including quantity, density, and/or spacing.
 - c. Recommended procedures for adhering single ply roofing to insulation.

- d. Statements which express warranty conditions for the successful performance of their insulation for the duration of the single ply manufacturer's warranty.
- B. Applicators approval certification by manufacturer.
- C. Proposed single ply manufacturer's specifications.
- D. Sample copy of membrane manufacturer's 20 year system warranty that is all inclusive and covers all components.
- E. Written documentation from the roofing system manufacturer indicating that they have been advised of all materials proposed for use, including the insulation substrate, fastenings and methods of installation, and that they are satisfied that all the materials and methods are compatible with their system, presenting no exception affecting the issuance of the specified warranty.
- F. Shop Drawings:
 1. Sheet membrane layout.
 2. Fastener pattern, layout, and spacing requirements for mechanically fastening insulation to metal roof deck.
 3. Termination details, Base flashings, cants.
 4. Board by board layout of any tapered system, complying with the drainage pattern required.
 5. Complete board layout of all insulation component, thicknesses, and the average "R" value of the completed insulation system.
 6. Verification of all roof conditions, including but not limited to: dimensions, elevations, and equipment, and conformance of same with the insulation manufacturer prior to shipment.
 7. Walkway pad route drawing.
- G. ANSI/FM 4474-2004 (R2010) test data demonstrating that the proposed roof assembly exhibits a tested uplift load capacity (L_t) equal to the design pressures of Part 1.5 B 4 multiplied by a minimum safety factor of 1.7.
- H. Manufacturers installation instructions revised for project.
- I. Samples:
 1. Sheet membrane: One 6 inch square piece.
 2. Sheet flashing: One 6 inch square piece.
 3. Fasteners: Two, each type.
 4. Seam: Two 12 inch square samples of joined seams to represent quality of field joined seams.
- J. Temporary Protection Plan. Include list of proposed temporary materials.

1.4 QUALITY ASSURANCE

- A. The roofing system shall be applied only by an approved contractor authorized prior to Bid by roof membrane manufacturer.
- B. The roofing and flashing methods to be employed shall be a complete system, with all insulation, membrane and flashing components and details of installation as recommended by the roofing system manufacturer, which are recognized in the roofing industry for having manufactured and warranted the type of installation proposed, for at least ten (10) years.
- C. Roofing installer shall be experienced in the installation of the specified system(s) and shall be able to demonstrate: not less than eight (8) years of continuous business operation in the roof contracting trade, not less than five (5) years as an approved contractor for the roof membrane manufacturer, and a minimum of five (5) warranted installations of the specified system of comparable scope and size to this project. Roofing installer shall be currently licensed by the approved roofing system manufacturer complying with the requirements of the Contract Documents.
 1. Work associated with elastomeric membrane roofing, including (but not limited to) vapor retarders, insulation, flashing and counter flashing, and expansion joints is to be performed by Installer of elastomeric membrane roofing.
- D. Before the Contract is awarded, provide proof of the following:
 1. The system manufacturer is familiar with all substrate materials proposed for use, and that the manufacturer agrees to provide all necessary on-site technical assistance to achieve a satisfactory installation.
 2. All materials and workmanship will be in strict accordance with the manufacturer's recommendations.
 3. The installation will be under the constant supervision of an experienced factory trained, licensed contractor. All work pertaining to the installation of the system shall only be completed by contractor personnel trained and authorized by the approved manufacturer in those procedures.
 4. A technical representative directly employed by the manufacturer shall visit the Site to inspect the installation of the membrane at least three (3) times each week, and will conduct a final inspection to observe the installed roof system and ascertain that the roofing system has been installed according to applicable manufacturer's specifications and details.
 - a. The manufacturer representative shall also provide a written report certifying that the roof membrane has been installed according to manufacturer recommendations and standards.
- E. There shall be no deviation made from the Specification or the approved Shop Drawings without prior written approval by the system manufacturer, the Engineer and the Owner.
- F. Roofing installer/contractor shall provide a constant full-time superintendent that shall be on site at all times while any work is in progress.

1.5 PERFORMANCE REQUIREMENTS

- A. Submit evidence that the proposed roofing system will meet the identified requirement of the following recognized code approval or testing agencies. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in the "Submittals" section of this Specification.
 - 1. Underwriters Laboratories
 - a. UL 790 - Class B Roof Assembly
 - 2. American Society of Testing and Materials
 - a. ASTM D4637 - Type I Membrane
- B. The materials system and installation shall be resistant to wind uplift to meet Connecticut State Building Code, latest edition, requirements with the following:
 - 1. Basic Wind Speed (3 Second Gust): 140 mph
 - 2. Exposure: C
 - 3. Importance Factor: 1.15
 - 4. According to ASCE 7-10, these parameters will result in the following ultimate uplift pressures for roof fasteners or adhesives:
 - a. Within 12 feet of a corner: 123 psf
 - b. Within 12 feet of an edge: 82 psf
 - c. At other areas: 49 psf

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle materials as specified by manufacturer.
- B. Store volatile materials separate from other materials with separation to prevent fire from damaging the work, or other materials.
- C. Protect foam insulation from direct exposure to sunlight.

1.7 WARRANTY

- A. 20-Year Total Systems Warranty: Upon successful completion of the Work and prior to receipt of final payment, provide 20-year Total Systems Warranty that is all inclusive and covers all components including materials and labor with no dollar limit from the approved membrane manufacturer. Warranty shall not be pro-rated.
- B. Manufacturer's Warranty: Shall provide wind speed coverage of 100 miles per hour.

PART 2 PRODUCTS

2.1 GENERAL

- A. Materials, products and installation procedures listed herein establish a minimum standard of quality by which the Engineer will evaluate all other materials proposed to accomplish the specified scope of work.
- B. Components to be used that are other than those supplied or manufactured by the approved manufacturer may be submitted for review and acceptance by the manufacturer providing the system warranty. Manufacturer’s acceptance of any other product is only for a determination of compatibility with their products. The specifications, installation instructions, limitations, and/or restrictions of the respective manufacturers must be reviewed by the Engineer for acceptability for use with the approved system/membrane manufacturer’s products.

2.2 EPDM SHEET ROOFING

- A. Conform to ASTM D4637, Type I, Grade 1, color black.
- B. Ethylene, propylene, diene, terpolymer (EPDM) formed into uniform, flexible sheets, 90 mil thick supplied in largest approved sheets possible for the Project, complying with ANSI/RMA IPR-1 and the following physical properties:
 - 1. Tensile Strength – 1305 psi min. (ASTM D412)
 - 2. Elongation – 300% min. (ASTM D412)
 - 3. Tear Resistance, Die C – 150 lbf/in min. (ASTM D624)
 - 4. Ozone Resistance – 7 days, 100 pphm, 104 degrees F, 50% extension, no cracks (ASTM D1149)
 - 5. Heat Aging, Accelerated, 4 Weeks/240 degrees F (ASTM D573)
 - a. Tensile strength – 1205 psi min.
 - b. Elongation – 200% min.
 - 6. Brittleness Temperature – minus 49 degrees F (ASTM D746)
 - 7. Permeability, Water Vapor, Proc. BW – 0.10 perms max. (ASTM E96)
 - 8. Factory Seam Strength – membrane ruptured (ASTM D816, modified)

PROPERTY	TEST METHOD	REQUIREMENT
Shore A Hardness	ASTM D2240	55 to 75 Durometer
Water Vapor Permeance	ASTM E96	Minimum 0.14 perms Water Method
Fungi Resistance	ASTM G21	After 21 days, no sustained growth or discoloration.
Fire Resistance	ASTM E108 Class A	No Combustion Beyond Flame/Heat Source

- C. Thickness:

1. Use 0.060-inch thick sheet.

D. Pipe Boots:

1. Molded EDPM designed for flashing of round penetrations, 12 inch minimum height.
2. Color same as roof membrane.

2.3 EPDM FLASHING SHEET

- A. Conform to ASTM D4637, Type I, Grade 1, Class U, unreinforced, color same as roof membrane modified as specified for flashing.
- B. Self curing EPDM flashing, adaptable to irregular shapes and surfaces.
- C. Minimum thickness 0.060-inch.

2.4 MISCELLANEOUS ROOFING MEMBRANE MATERIALS

- A. Sheet roofing manufacturers specified products.
- B. Splice Adhesive: For roofing and flashing sheet.
- C. Lap Sealant: Liquid EPDM rubber for roofing sheet exposed lap edge.
- D. Bonding Adhesives: Neoprene, compatible with roofing membrane, flashing membrane, insulation, metals, concrete, and masonry for bonding roofing and flashing sheet to substrate.
- E. Fastener Sealer: One part elastomeric adhesive sealant.
- F. Insulation: Rigid insulation shall be polyisocyanurate with integrated facing material both sides, approved for use under membrane. Insulation shall comply with FM 4450 or UL 1256 tests for use directly over concrete deck without thermal barrier. Provide tapered insulation as required to obtain counterslopes and provide tapered edge strip cut and installed as required at crickets and up-slope of roof accessories to insure approved drainage. Insulation shall have the following minimum properties:
 1. R-value: Overall average value of 30
 2. Density: 2.0 pcf (ASTM D1622)
 3. Compressive Strength: 20 psi (ASTM C165)
 4. Water Vapor Transmission Perm Rating: <1.0 (ASTM E96)
- G. Temporary Closure Sealers (Night Sealant): Polyurethane two part sealer.
- H. Primers, Splice Tapes, Cleaners, and Butyl Rubber Seals: As specified by roof membrane manufacturer.
- I. Asphalt Roof Cement: ASTM D4586.

2.5 MISCELLANEOUS LUMBER

- A. Lumber for concealed boards or blocking shall be provided in accordance with Section 06 10 00, Rough Carpentry.

2.6 FASTENERS

- A. Fasteners and washers required for securing nailers to deck:
 - 1. Steel stress plate washers as required by sheet roofing manufacturer:
 - a. Coated against corrosion.
 - b. Separate or attached to fastener.
 - c. Approximately 2-inch diameter or 1-1/2 by 2-1/2 inches rectangular plate with rounded corners, minimum thickness 0.023-inch.
 - 2. Fastening strip or batten strip for securing roof membrane to deck:
 - a. Stainless steel strip: ASTM A167 type 302 or 304, minimum 0.018-inch thick.
 - b. Aluminum strip: ASTM B209, minimum 0.094-inch thick.
 - c. Rounded corners on strips.
 - d. Form strips 1-1/2 inches wide, 10 feet maximum length with 1/4 by 3/8 inch punched slotted holes at 4-inch centers; centered on width of strip. Punch holes 1/16 inch larger than fastener shank when shank is larger than 3/16 inch.
 - 3. Wood:
 - a. Screws; Fed. Spec. FF-S-111, Type I, Style 2.5, coated to resist corrosion, length to provide 3/4 inch minimum penetration.
 - b. Nails: Barbed shank, galvanized.
 - 4. Washers: Neoprene backed metal washer 1-1/8 inch minimum diameter.
 - 5. To Sheet Metal: Self tapping screw; Fed. Spec. FF-S-107, No. 14. sheet metal screw, minimum thread penetration of 1/4 inch; stainless steel.
- B. Pipe Compression Clamp or Drawband:
 - 1. Stainless steel or cadmium plated steel drawband.
 - 2. Worm drive clamp device.

2.7 COVER BOARD

- A. Gypsum Board: ASTM C1278 non-faced, gypsum and cellulose fiber substrate, thickness to be minimum as required to achieve specified fire rating or 1/2", whichever is greater.

2.8 FLEXIBLE TUBING

- A. Closed cell neoprene, butyl polyethylene, vinyl, or polyethylene tube or rod.
- B. Diameter approximately 1-1/2 times joint width.

PART 3 EXECUTION

3.1 GENERAL

- A. Do not apply roof membrane if deck will be used for subsequent work platform, storage of materials, or staging or scaffolding will be erected thereon unless protection is provided to distribute loads less than one-half compression resistance of roofing system materials.
- B. Coordinate roof operation with sheet metal work and roof insulation work so that insulation and flashing are installed concurrently to permit continuous roofing operations.
- C. Complete installation of flashing, insulation, and roofing in the same day except for the area where temporary protection is required when work is stopped.
- D. Phased construction is not permitted.
- E. Dry out surfaces that become wet from any cause during progress of the work before roofing work is resumed.
- F. Apply materials only to dry substrates.
- G. Except for temporary protection specified, do not apply materials during damp or rainy weather, during excessive wind conditions, nor while moisture (dew, snow, fog, ice, or frost) is present in any amount in or on the materials.
 - 1. Do not apply materials to substrate having temperature of 40 degrees F or less, or when materials applied with the roof require higher application temperature.
 - 2. Do not apply materials when the temperature is below 40 degrees F.
- H. Temporary Protection:
 - 1. Install temporary protection consisting of a temporary seal and water cut-offs at the end of each day's work and when work is halted for an indefinite period or work is stopped when precipitation is imminent.
 - 2. Temporarily seal exposed surfaces of insulation within the roofing membrane.
 - 3. Do not leave insulation surfaces or edges exposed.
 - 4. Use polyethylene film or building paper to separate roof sheet from bituminous materials.
 - 5. Apply the temporary seal and water cut off by extending the roof membrane beyond the insulation and securely embedding the edge of the roof membrane in 1/4-inch-thick by 2 inches wide strip of temporary closure sealant (night sealant) and weight edge with sandbags, to prevent displacement; space sandbags not over 8 foot centers. Check daily to ensure temporary seal remains watertight. Reseal open areas and weight down.
 - 6. Before the work resumes, cut off and discard portions of the roof membrane in contact with roof cement or bituminous materials.
 - a. Cut not less than 6 inches back from bituminous coated edges or surfaces.
 - b. Remove temporary polyethylene film or building paper.

7. Remove and discard sandbags contaminated with bituminous products.
8. For roof areas that are to remain intact and that are subject to foot traffic and damage, provide temporary wood walkways with notches in sleepers to permit free drainage.
9. Provide 6 mil polyethylene sheeting or building paper cover over roofing membrane under temporary wood walkways and adjacent areas. Round all edges and corners of wood bearing on roof surface.

3.2 PREPARATION

- A. Test pull out resistance of fasteners in deck in the presence of the Engineer before starting roofing work. Tests are not required for wood. Tests will be required for any fasteners used to attach new nailers to concrete substrate where such fasteners are required by the roofing manufacturer.
 1. Test applicable fastener type in applicable deck.
 2. Install fasteners through a sample of the insulation, if any is to be used, into the structural deck.
 3. Test the pull out resistance with a pull out tester.
 4. Test one fastener in each deck level and one for every 2500 square feet of deck type and level.
 5. Test at locations designated by Engineer.
 6. Do not proceed with the roofing work if the pull out resistance of the fasteners is less than specified.
 7. Test results:
 - a. Repeat tests using other type fasteners or use additional fasteners to stay within the pullout load resistance criteria.
- B. Verify that all roof drain lines are unblocked before starting Work. Report any blockages to the Engineer in writing.
- C. The building and its contents shall be protected against all risks, and any damages shall be repaired or replaced. All exterior building and ground areas shall be protected from damage. Debris generated by any work of this project must be prevented from entering the interior of the building, or any roof drains.
 1. This may include, but will not be limited to, cleaning by vacuum cleaner or other means daily, or more frequently, as needed to achieve the required result stated above.
 2. It may also be necessary to erect barriers to prevent the migration of sawdust or particles of insulation.
- D. Remove dirt, debris, and surface moisture. Cover or fill voids greater than 6 mm (1/4 inch) wide to provide solid support for roof membrane.

- E. All surfaces to receive new membrane or flashings shall be thoroughly dried, including deck flutes. Should surface moisture occur, provide the necessary equipment to dry the surface prior to application.
- F. Broom clean roof decks. Remove dust, dirt and debris. Cover or fill voids greater than 1/4 inch wide to provide solid support for roof membrane.
- G. Remove projections capable of damaging roofing materials.
- H. Install separation sheet over bituminous material on deck surface lapping edges and ends 150 mm (6 inches) or as recommended by roof membrane manufacturer.
 - 1. Do not install of separation sheet beyond what can be covered by roofing membrane each day.
 - 2. Use polyethylene, or building paper, that will be compatible with seaming method.
 - 3. Insure separation sheet completely isolates bituminous materials from EPDM roofing membrane.
 - 4. Turn up at penetrations, or other surfaces where bituminous materials occur, to cover bituminous product.
 - 5. Turn down over edges of blocking at perimeters to cover blocking.

3.3 INSULATION INSTALLATION

- A. Insulation shall be installed in accordance with section 07 22 00, Roof and Deck Insulation.
- B. Insulation shall be neatly cut to fit around penetrations and projections.
- C. Tapered insulation shall be installed in accordance with insulation manufacturer's approved shop drawings.
- D. Do not install more insulation board than can be covered with approved membrane by the end of the day or the onset of inclement weather.
- E. Use at least 2 layers of insulation when the total insulation thickness exceeds 2.5 inches. Stagger joints at least 12 inches between layers.

3.4 INSTALLATION OF ROOFING AND FLASHING

- A. Install membrane by unrolling over prepared substrate, lapping adjoining sheets as recommended by the manufacturer, minimum of 3 inches. Cut sheets to maximum size possible to minimize seams.
- B. Do not allow the membrane to come in contact with surfaces contaminated with asphalt, coal tar, oil, grease, or other substances which are not compatible with EPDM roofing membrane.
- C. If possible, install the membrane so the sheets run perpendicular to the long dimension of the insulation boards.
- D. If possible, start at the low point of the roof and work towards the high point. Lap the sheets so the flow of water is not against the edges of the sheet. Coordinate with roof insulation installation.

- E. Position the membrane so it is free of buckles and wrinkles.
- F. Roll sheet out on deck; inspect for defects as sheet is being rolled out and remove defective areas.
 - 1. Allow 30 minutes for relaxing before proceeding.
 - 2. Lap edges and ends of sheets 3 inches or more as recommended by the manufacturer. Clean lap surfaces as specified by manufacturer.
 - 3. Adhesively splice laps. Apply pressure as required. Seam strength of laps as required by ASTM D4637.
 - 4. Check seams to ensure continuous adhesion and correct defects.
 - 5. Finish edges of laps with a continuous beveled bead of lap sealant to sheet edges to provide smooth transition as specified by manufacturer.
 - 6. Finish seams as the membrane is being installed (same day).
 - 7. Anchor perimeter to deck or wall as specified.
- G. Install flashings as the membrane is being installed (same day). If the flashing cannot be completely installed in one day, complete the installation until the flashing is in a watertight condition and provide temporary covers or seals.
- H. Flashing Roof Drains:
 - 1. Install roof drain flashing as recommended by the membrane manufacturer, generally as follows:
 - a. Coordinate to set the metal drain flashing in asphalt roof cement, holding cement back from the edge of the metal flange.
 - b. Do not allow the roof cement to come in contact with the EPDM roof membrane.
 - c. Adhere the EPDM roof membrane to the metal flashing with the membrane manufacturer's recommended bonding adhesive.
 - 2. Turn down the metal drain flashing and EPDM roof membrane into the drain body and install clamping ring and stainer.
- I. Installing EPDM Base Flashing and Pipe Flashing:
 - 1. Install EPDM flashing membranes to pipes, walls or curbs to a height not less than 12 inches above roof surfaces and 4 inches on roof membranes.
 - a. Adhere flashing to pipe, wall or curb with bonding adhesive.
 - b. Form inside and outside corners of EPDM flashing membrane in accordance with NRCA EPDM Single-Ply Detail 1989-N. Form pipe flashing in accordance with NRCA Single-Ply Detail 1989-T-1, pipe boot, or 1987-T-2, flashing membrane.
 - c. Lap ends not less than 4 inches.

- d. Adhesively splice flashing membranes together and flashing membranes to roof membranes. Finish exposed edges with sealant as specified.
 - e. Install flashing membranes in accordance with NRCA EPDM Single-Ply Details 1989 E, 1989-H, 1989-N and 1989-T-1 or 1989-T-2.
2. Anchor top of flashing to curbs with fasteners spaced not over 6 inches on center. Use surface mounted fastening strip with sealant on ducts. Use pipe clamps on pipes or other round penetrations.
 3. Apply sealant to top edge of flashing.
- J. Repairs to membrane and flashings:
1. Remove sections of EPDM sheet roofing or flashing that is creased wrinkled or fishmouthed.
 2. Cover removed areas, cuts and damaged areas with a patch extending 4 inches beyond damaged, cut, or removed area. Adhesively splice to roof membrane or flashing. Finish edge of lap with sealant as specified.

3.5 FIELD QUALITY CONTROL

- A. Examine and probe seams in the membrane and flashing in the presence of the Engineer and Membrane Manufacturer's Inspector.
- B. Probe the edges of welded seams with a blunt tipped instrument. Use sufficient hand pressure to detect marginal bonds, voids, skips, and fishmouths.
- C. Cut 4 inch wide by 12 inch long samples through the seams where directed by the Engineer.
 1. Cut one sample for every 1500 linear feet of seams.
 2. Cut the samples perpendicular to the longitudinal direction of the seams.
 3. Failure of the samples to maintain the standard of quality within a reasonable tolerance of the approved samples will be cause for rejection of the work.
- D. Repair areas of welded seams where samples have been taken or marginal bond voids or skips occur.
- E. Repair fishmouths and wrinkles by cutting to lay flat and installing patch over cut area extending 4 inches beyond cut.

3.6 COVER BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Install cover board with long joints of cover board in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with cover board.

1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
 - D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
 - E. Preliminarily Fastened Insulation for Mechanically Fastened Systems: Install insulation with fasteners at rate required by roofing system manufacturer or applicable authority, whichever is more stringent.
 - F. Adhered Cover Board: Adhere cover board to substrate as follows:
 1. Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.
 - G. Proceed with installation only after unsatisfactory conditions have been corrected
- 3.7 TEMPORARY ROOF
- A. Install temporary roof when sequences of work or weather does not permit installation of a completed permanent roof system or roof would be subject to phasing of roof work, construction traffic, scaffolds, and work over roof area. Temporary roofing shall be installed prior to leaving site each night that roofing/decking is not fully installed.
 - B. Use 0.045-inch thick non-reinforced EPDM membrane or other temporary membrane as approved.
 - C. Secure membrane to deck with mechanical fasteners or temporary ballast not exceeding deck dead load capacity.
 - D. Temporary roofing/decking shall be securely fastened and tied down to withstand wind, snow, rain, and other environmental conditions.
 - E. Repair cuts, tears, and punctures with patches to keep system watertight.

END OF SECTION

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SECTION 07 59 50

PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Work Includes:

1. Roof tear-off, temporary roofing membrane, roof re-cover preparation, removal of base flashings on existing construction in preparation to receive new roofing membrane.

1.2 RELATED WORK

- A. Use of the premises and phasing requirements: Section 01 14 00 Work Restrictions.
- B. Temporary construction and environmental-protection measures for re-roofing preparation: Section 01 76 00 Protection of Installed Construction.
- C. Hazardous material abatement: Division 02 Specifications.
- D. HVAC equipment removal and reinstallation: Division 23 Specifications.
- E. Electrical equipment disconnection and reconnection: Division 26 Specifications.

1.3 REFERENCES

- A. American National Standards Institute/Single-Ply Roofing Institute (ANSI/SPRI):
ANSI/SPRI FX-1-01(R2006) Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
- B. ASTM International (ASTM):
 - A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - C208 Cellulosic Fiber Insulating Board
 - C728 Perlite Thermal Insulation Board
 - C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
 - C1278 Standard Specification for Fiber-Reinforced Gypsum Panel
 - D1079 Standard Terminology Relating to Roofing and Waterproofing
- C. FM Approvals: RoofNav Approved Roofing Assemblies and Products.
 - 4450-89 Approved Standard for Class 1 Insulated Steel Deck Roofs
 - 4470-10 Approved Standard for Class 1 Roof Coverings

- 1-28-09 Loss Prevention Data Sheet: Design Wind Loads.
- 1-29-09 Loss Prevention Data Sheet: Above-Deck Roof Components
- 1-49-09 Loss Prevention Data Sheet: Perimeter Flashing

D. National Roofing Contractors Association: Roofing and Waterproofing Manual

1.4 QUALITY CONTROL

- A. See requirements of Section 07 53 00 for qualifications of roofing system and roofing insulation Installer. Work of this section shall be performed by same Installer.
 - 1. Where Project requirements include work affecting existing roofing system to remain under warranty, Installer must be approved by warrantor of existing roofing system.
- B. Regulatory Requirements: Comply with governing Federal, State, and Local regulations. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Re-roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner; Engineer; testing and inspecting agency representative; roofing system manufacturer's representative; Commissioning Agent; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects re-roofing.
 - 2. Review methods and procedures related to roofing system tear-off and replacement

1.5 SUBMITTALS

- A. List of any proposed temporary roofing materials.
- B. Fastener pull-out test report.
- C. Photographs or Videotape: Document existing conditions of adjacent construction including site improvements.
- D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a licensed landfill facility.

1.6 PROJECT CONDITIONS

- A. Owner will occupy building below re-roofing area during work. Conduct re-roofing so Owner's operations will not be disrupted.
 - 1. Coordinate work activities daily with Owner.
 - 2. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
- B. Protect building and landscaping from damage.
- C. Maintain access to existing walkways and adjacent occupied facilities.

- D. Weather Limitations: Proceed with re-roofing preparation only when weather conditions permit Work to proceed without water entering existing roofing system or building.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces affected by reroofing, by methods and with materials acceptable to warrantor.
 - 1. Notify warrantor of existing roofing system before proceeding, and upon completion of reroofing.
 - 2. Obtain documentation verifying that existing roofing system has been inspected by warrantor and warranty remains in effect. Submit documentation at Project closeout.

PART 2 PRODUCTS

2.1 TEMPORARY ROOFING MATERIALS

- A. Design of temporary roofing and selection of materials are responsibilities of Contractor.

2.2 RECOVER BOARDS

- A. Insulation Serving as Recover Board: Requirements are specified in Section 07 22 00 ROOF AND DECK INSULATION.
- B. Fasteners: Factory-coated steel fasteners, No. 12 or 14, and metal or plastic plates listed in FM Approval's "RoofNav."

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect existing membrane roofing system that is indicated not to be reroofed.
 - 1. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
 - 2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing
- B. Coordinate with Owner to shut down equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with re-roofing work that could affect indoor air quality or activate smoke detectors.
- C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain

plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 2. Do not permit water to enter into or under existing roofing system components that are to remain.
- E. The roof deck must be structurally sound to provide support for the new roof system. Load materials on the rooftop in such a manner to eliminate risk of deck overload due to concentrated weight.
- F. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

3.2 ROOF TEAR-OFF

- A. General: Notify Owner each day of extent of roof tear-off proposed for that day.
- B. If any unusual or concealed condition is discovered, stop work and notify Engineer and membrane manufacturer immediately in writing.
- C. Remove aggregate ballast from roofing membrane.
- D. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing using a power broom.
- E. Remove pavers and accessories from roofing membrane.
- F. Remove protection mat and insulation from protected roofing membrane.
- G. Roof Tear-Off:
1. Remove existing roofing membrane and other roofing system components down to the deck.
 2. Remove cover boards, roof insulation, and substrate boards.
 3. Dry bitumen and felts that are firmly bonded to concrete, gypsum or cementitious wood fiber decks may remain. Remove wet or unadhered bitumen and felts.
 4. Comply with FM Approvals requirements for removal of excess asphalt from steel decks.
 5. Remove fasteners from deck or cut fasteners off slightly above deck surface and apply recover board prior to installing roof membrane.
- H. Partial Roof Tear-Off:
1. Where indicated, remove existing roofing membrane and other membrane roofing system components down to the deck.
 2. Remove cover boards, roof insulation, and substrate boards.

3. Dry bitumen and felts that are firmly bonded to concrete decks may remain. Remove wet or unadhered bitumen and felts.
4. Comply with FM Approvals requirements for removal of excess asphalt from steel decks.
5. Remove fasteners from deck or cut fasteners off slightly above deck surface and apply recover board prior to installing roof membrane.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of existing roofing system.
- B. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263. Do not proceed with roofing work if moisture condenses under the plastic sheet.
- C. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Engineer. Do not proceed with installation until directed by Engineer.
- D. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Engineer. Do not proceed with installation until directed by Engineer.
 1. Cementitious wood fiber (CWF) decking requiring replacement shall be replaced in kind with new CWF decking. New CWF decking shall be attached to the existing structure in a manner identical to the existing CWF decking, whether mechanically fastened to existing joists or grouted to existing bulb tees. Installation shall comply with all recommendations of the CWF decking manufacturer.
 2. Deteriorated bulb tees exhibiting 10% or greater section loss shall be replaced in kind.
 3. Where rusted metal deck is discovered, repair deck as follows:
 - a. Cut out the rusted deck, leaving no rusted metal in place.
 - b. Provide new 20 gauge galvanized metal roof deck conforming to ASTM A653, grade 33, in profile to match and “nest” with existing.
 - c. Cut new deck to provide 6 inch minimum lap at all sides.
 - d. Attach new deck to existing deck by means of #12 stainless steel hex-washer head self-drilling, self-tapping screws in every flute or at 6 inches on center maximum around perimeter of repair.

3.4 TEMPORARY ROOFING MEMBRANE

- A. Install approved temporary roofing membrane over area to be re-roofed.
- B. Remove temporary roofing membrane before installing new roofing membrane.

3.5 EXISTING BASE FLASHINGS

- A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
 - 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings specified in Section 07 62 00 Sheet Metal Flashing and Trim.
 - 1. Refer to drawings for locations and quantities of existing counterflashings to remain.
- C. Remove existing parapet sheathing and replace with new pressure-treated plywood sheathing, 19/32 inch thick. If parapet framing has deteriorated, immediately notify Engineer.

3.6 FASTENER PULL-OUT TESTING

- A. Retain independent testing and inspecting agency to conduct fastener pull-out tests according to SPRI FX-1, and submit test report to Engineer before installing new roofing system.
 - 1. Obtain Engineer's approval to proceed with specified fastening pattern.

3.7 DISPOSAL

- A. Collect and promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - 1. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials. Comply with Division 02 Specifications for management of hazardous materials.

END OF SECTION

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SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Exposed trim and fascia
 - 2. Metal flashing
- B. Related Sections
 - 1. Section 07 53 00 – EPDM Sheet Roofing

1.2 REFERENCES

- A. The Connecticut State Building Code, Latest Edition.]
- B. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
- C. ASTM A240 – Standard Specification for Chromium and Chromium – Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- D. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- E. ASTM B32 – Standard Specification for Solder Metal
- F. ASTM D4397 – Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
- G. ASTM E154 – Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
- H. AAMA 605.2 – Specification for High Performance Organic Coatings on Architectural Extrusions and Panels
- I. FS UU-B-790 – Federal Specification – Building Paper, Vegetable Fiber: Kraft, Waterproofed, Water Repellant and Fire Resistant
- J. SMACNA – Sheet Metal and Air Conditioning Contractors’ National Association

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.
- B. Fabricate and install flashings at roof edges to comply with recommendations of FM Loss Prevention Data Sheet 1-49 for the following wind pressures:
 - 1. Within 12 feet of a corner: 46 psf

2. At other areas: 38 psf

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specifications.
- B. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.
- C. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include sample sets composed of 2 or more units showing the full range of variations expected.
 - 1. 8-inch square samples of specified sheet materials to be exposed as finished surfaces.
 - 2. 12-inch long samples of factory-fabricated products exposed as finished Work. Provide complete with specified factory finish.
- D. Qualification data for firms and persons to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an Installer with 10 years of experience and who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

1.6 PROJECT CONDITIONS

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 PRODUCTS

2.1 METALS

- A. Stainless Steel: ASTM A240, Type 302B, dead soft temper, with a minimum thickness of 0.015 inch, unless otherwise indicated.
- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
 - 1. Aluminum Sheet: ASTM B209, 3003-H14, with a minimum thickness of 0.060 inch, unless otherwise indicated.
 - 2. Finish to match aluminum fascia on existing building.
 - 3. Provide factory painted finish for exposed aluminum flashing and trim consisting of 0.2 to 0.4 mil prime coat and minimum finish coat thickness of 1.0 mil baked at 450°F metal temperature. Coating system shall be Kynar 500 Fluoropolymer or equal.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Fasteners: Same metal as sheet metal flashing or other non-corrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- B. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat
- C. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant
- D. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants"
- E. Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints
- F. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal
- G. Paper Slip Sheet: 5-lb/square red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.
- H. Polyethylene Underlayment: ASTM D4397, minimum 6-mil thick black polyethylene film, resistant to decay when tested according to ASTM E154.
- I. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; non-corrosive; size and thickness required for performance

2.3 FABRICATION, GENERAL

- A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.
- B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
- D. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- E. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

- F. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- G. Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, non-corrosive metal recommended by sheet metal manufacturer.
 - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.4 SHEET METAL FABRICATIONS

- A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.
- B. Exposed Trim, Gravel Stops, and Fascia: Fabricate from the following material:
 - 1. Aluminum: 0.060 inch thick
- C. Base Flashing: Fabricate from the following material:
 - 1. Aluminum: 0.060 inch thick
- D. Counterflashing: Fabricate from the following material:
 - 1. Aluminum: 0.060 inch thick.
- E. Flashing Receivers: Fabricate from the following material:
 - 1. Aluminum: 0.060 inch thick.

2.5 ALUMINUM FINISHES

- A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.
- B. High-Performance Organic Coating Finish: AA-C12C42R1x Organic Coating (as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
 - 1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604.
 - a. Color and Gloss:
 - 1) Aluminum Fascia: Match existing fascia
 - 2) Gravel stop: As selected by the Owner.

- 3) Other materials and assemblies: As selected by Owner from manufacturer's full range of choices for color and gloss.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Roof-Edge Flashings: Secure metal flashings at roof edges in accordance with performance requirements specified in Section 1.3.B.
- D. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- E. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.
 1. Use joint adhesive for nonmoving joints specified not to be soldered.
- F. Seams:
 1. Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- G. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
 1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.

2. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.
 - H. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches and bed with sealant.
- 3.3 CLEANING AND PROTECTION
- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
 - B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION

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SECTION 07 72 00
ROOF ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof Curbs
- B. Related Sections:
 - 1. Section 06 10 00 – Rough Carpentry
 - 2. Section 07 53 00 – EPDM Sheet Roofing
 - 3. Section 07 62 00 – Sheet Metal Flashing and Trim

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.
- C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for roof accessories with factory-applied color finishes.
- E. Samples for Verification: For each type of exposed finish required, prepared on Samples in manufacturer's standard sizes, and of same thickness and material indicated for the Work. If finishes involve normal color or shade variations, include sample sets showing the full range of variations expected.

1.3 QUALITY ASSURANCE

- A. Standards: Comply with the following:
 - 1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
1. Roof Curbs and Equipment Supports:
 - a. Conn-Fab Sales, Inc.
 - b. Curbs Plus, Inc.
 - c. Custom Curb, Inc.
 - d. Pate Co.(The).
 - e. ThyCurb, Inc.

2.2 MATERIALS, GENERAL

- A. Curbs shall be manufactured entirely from compatible materials.
- B. Aluminum Sheet: ASTM B 209 for alclad alloy 3005H25 or alloy and temper required to suit forming operations, with mill finish, unless otherwise indicated.
- C. Extruded Aluminum: ASTM B 221 alloy 6063-T52 or alloy and temper required to suit structural and finish requirements, with mill finish, unless otherwise indicated.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M with G90 coating designation; commercial quality, unless otherwise indicated.
1. Structural Quality: Grade 40, where indicated or as required for strength.
- E. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M with Class AZ-50 coating, structural quality, Grade 40, or as required for strength.
- F. Insulation: Manufacturer's standard rigid or semi-rigid glass-fiber board of thickness indicated.
- G. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 inches thick.
- H. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
1. Where removing exterior exposed fasteners affords access to building, provide nonremovable fastener heads.
 2. Carbon steel, aluminum and electroplated galvanized steel fasteners and connectors shall not be used in contact with treated wood.
- I. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.
- J. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.

- K. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- L. Elastomeric Sealant: Generic type recommended by curb manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants"

2.3 ROOF CURBS

- A. General: Provide roof curbs capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
- B. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.063-inch-thick, sheet aluminum with welded corner joints.
 - 1. Provide preservative-treated wood nailers at tops of curbs and formed flange at perimeter bottom for mounting to roof.
 - 2. Provide manufacturer's standard rigid or semirigid insulation where indicated.
 - 3. Provide formed cants and base profile coordinated with roof insulation thickness.
 - 4. Fabricate units to minimum height of 12 inches, unless otherwise indicated.
 - 5. Sloping Roofs: Where slope of roof deck exceeds $\frac{1}{4}$ inch per foot, fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

- B. Install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated,
- C. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.
- D. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal. Seal over top of flange with roof membrane.
- E. Cap Flashing: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counterflashing). Seal overlap with thick bead of mastic sealant.
- F. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.2 CLEANING AND PROTECTION

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION

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SECTION 07 72 33

ROOF HATCHES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Roof Hatches
2. Ladder Safety Post
3. Roof Hatch Rail System

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.

1.3 QUALITY ASSURANCE

A. Standards: Comply with the following:

1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Hatch, ladder safety post, and roof hatch rail system shall be provided by a single manufacturer, and shall be chosen for compatibility. Subject to compliance with requirements, provide products by one of the following:

1. Roof Hatches:
 - a. Bilco Company
 - b. Milcor, Inc.
 - c. Nystrom Products Co.
 - d. Approved Equal
2. Ladder Safety Post:
 - a. Bilco Company
 - b. Milcor, Inc.
 - c. Nystrom Products Co.
 - d. Approved Equal
3. Roof Hatch Rail System:

- a. Bilco Company
- b. Milcor, Inc.
- c. Nystrom Products Co.
- d. Approved Equal

2.2 MATERIALS, GENERAL

- A. Stainless Steel Sheet: 14 gauge type 304, with mill finish, unless otherwise indicated
- B. Insulation: Manufacturer's standard rigid or semi-rigid glass-fiber board of thickness indicated
- C. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
 - 1. Where removing exterior exposed fasteners affords access to building, provide nonremovable fastener heads.
 - 2. Carbon steel, aluminum and electroplated galvanized steel fasteners and connectors shall not be used in contact with treated wood.
- D. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork
- E. Elastomeric Sealant: Generic type recommended by hatch manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants"
- F. All materials used in the construction must be NSF 61 approved for use in contact with potable water.

2.3 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.4 SINGLE LEAF ROOF HATCH

- A. Furnish and install where indicated on plans metal roof hatch, size as required to match existing. The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.
 - 1. Roof hatch shall be Bilco Type "S" or equivalent from manufacturers listed in Part 2.1 A 1.

- B. Performance characteristics:
1. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m²) with a maximum deflection of 1/150th of the span or 20 psf wind uplift.
 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 3. Operation of the cover shall not be affected by temperature.
 4. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.
- C. Cover: Shall be 14 stainless steel with a 3" (76mm) beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
- D. Cover insulation: Shall be fiberglass of 1" (25.4mm) thickness, fully covered and protected by a metal liner 22 gauge stainless steel.
- E. Curb: Shall be 12" (305mm) in height, watertight, fully enclosed and of 14 gauge stainless steel construction. The curb shall be formed with a 3-1/2" (89mm) flange with 7/16" (11.1mm) holes provided for securing to the roof deck. The curb shall be fully welded at the corners.
- F. Curb insulation: Shall be rigid, high-density fiberboard of 1" (25.4mm) thickness on outside of curb.
- G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe through bolted to the curb assembly.
- H. Hardware
1. Provide heavy pintle hinges.
 2. Cover shall be equipped with a spring latch with interior and exterior turn handles.
 3. Roof hatch shall be equipped with interior and exterior padlock hasps.
 4. The latch strike shall be a stamped component bolted to the curb assembly.
 5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" (25.4mm) diameter red vinyl grip handle to permit easy release for closing.
 6. Compression spring tubes and all other hardware shall be of type 316 stainless steel construction. Springs shall have an electrocoated acrylic finish for corrosion resistance.
 7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

- I. Finishes: Factory finish shall be mill finish.

2.5 LADDER SAFETY POST

- A. General: Steel tubular section construction with automatic locking mechanism in fully extended position
- B. Provide safety post, as indicated.
 - 1. Finish: Baked black enamel paint
 - 2. Location: At roof access ladder

2.6 HATCH RAIL SYSTEM

- A. Furnish and install where indicated on plans hatch rail system at roof hatch. The hatch rail system shall be field assembled and installed per the manufacturer's instructions.
- B. Performance characteristics:
 - 1. High visibility safety yellow powder coat paint finish.
 - 2. Hatch rail system shall attach to the capflashing of the roof hatch and shall not penetrate any roofing material.
 - 3. Hatch rail system shall satisfy the requirements of OSHA 29 CFR 1910.23 and shall meet OSHA strength requirements with a factor of safety of two.
 - 4. Corrosion resistant construction with a five-year warranty.
 - 5. Hinged gate shall ensure continuous barrier around the roof hatch.
 - 6. Self-closing gate hinge and positive latching system provided with hatch rail system.
- C. Posts and Rails: 1-1/4" (32mm) 6061 T6 schedule 40 aluminum pipe
- D. Hardware: Mounting brackets shall be 3/8" (9mm) thick extruded aluminum. Pivoting post guides with compression fittings and latching mechanism shall be cast aluminum. Self-closing hinges and all fasteners shall be type 316 stainless steel.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written instructions. Coordinate installation of roof accessories with installation of other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.
- B. Install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated,
- C. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal.

3.2 CLEANING AND PROTECTION

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION

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SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Exterior joints in vertical surfaces and non-traffic horizontal surfaces as indicated below:
 - a. Joints between flashings, curbs, edge metal, and other components associated with the roof system.
 - b. Joints between new and existing lightweight concrete topping slabs.

B. Related Sections

1. Section 07 53 00 – EPDM Sheet Roofing
2. Section 07 62 00 - Sheet Metal Flashing and Trim
3. Section 07 72 00 - Roof Accessories
4. Section 07 72 33 - Roof Hatches

1.2 REFERENCES

- A. ASTM C717 - Standard Terminology of Building Seals and Sealants
- B. ASTM C719 - Standard Test Method for Adhesion Cohesion of Elastomeric Joint Sealants under Cyclic Movement (Hockman Cycle)
- C. ASTM C834 - Standard Specification for Latex Sealants
- D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants
- F. ASTM C1193 - Standard Guide for Use of Joint Sealants
- G. ASTM D1056 - Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
- H. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stop
- I. Underwriters Laboratories, Inc.

1.3 PERFORMANCE

- A. Provide joint sealants that have been produced and installed to establish and maintain watertight and air tight continuous seals.

1.4 SUBMITTALS

- A. Submit Product Data from manufacturers for each joint sealant product required, including instructions for joint preparation and joint sealant application.
- B. Submit samples for Initial Selection Purposes - Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- C. Submit samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in ½-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealant.
- D. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications - Company specializing in performing the work of this Section who has successfully completed within the last 3 years at least 3 joint sealant applications similar in type and size to that of this Project.
- B. Single Source Responsibility for Joint Sealant Materials - Obtain joint sealer materials from a single manufacturer for each different product required.
- C. All sealants shall be used as received from the manufacturer and no thinning or other alterations will be allowed at the job site.
- D. Preconstruction Field Testing - Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:
 - 1. Locate test joints as directed by the Engineer
 - 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated
 - b. Each type of non-elastomeric sealant and joint substrate indicated
 - 3. Arrange for tests to take place with both the Engineer and joint sealant manufacturer's technical representative present.
 - 4. Test Method - Test joint sealants by hand pull method described below:
 - a. Install joint sealants in 5-foot joint lengths using same materials and methods required for joint preparation and joint sealant installation required for completed work. Allow sealants to cure fully before testing.
 - b. Make knife cuts as follows: A horizontal cut from one side of joint to the other followed by 2 vertical cuts approximately 2-inch long at side of joint and meeting horizontal cut at top of 2-inch cuts. Place a mark 10-inch from top of 2-inch piece.
 - c. Use fingers to grasp 2-inch piece of sealant just above 1-inch mark; pull firmly down at a 90° angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive compatibility, but not less than that

equaling specified maximum movement capability in extension; hold this position for 10 seconds.

5. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
6. Evaluation of Field Test Results - Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants which fail to adhere to joint substrates during testing.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions - Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40°F (4.4°C).
 2. When joint substrates are wet due to rain, frost, condensation or other causes.
- B. Joint Width Conditions - Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions - Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.8 SEQUENCING AND SCHEDULING

- A. Sequencing installation of joint sealers to occur not less than 21 or more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility - Provide joint sealants that are compatible with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors - Provide color of exposed joint sealants as selected by the Engineer from manufacturer's standard colors.

2.2 ELASTOMERIC JOINT SEALANTS

- A. One-Part Nonacid-Curing Silicone Sealant - Type S - Grade NS - Class 25 - and complying with the following requirements for uses and additional joint movement capability.
 - 1. Uses T, NT, M, G, A, and as applicable to joint substrates indicated, O.
 - 2. Additional capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719 to withstand the following, percentage increase and decrease of joint width as measured at time of application and remain in compliance with other requirements of ASTM C920 for uses indicated.
 - a. 100% movement in extension and 50% movement in compression for a total of 150% movement.
- B. Products - Subject to compliance with requirements, provide one of the following:
 - 1. One-Part Nonacid-Curing silicone Sealant:
 - a. Silpruf SCS 2000 - General Electric Co.
 - b. 864 - Pecora Corp.
 - c. Spectrem 1 - Tremco, Inc.
 - d. Spectrem 2 - Tremco, Inc.
 - e. or equal.

2.3 JOINT SEALANT BACKING

- A. General - Provide sealant backings of material and type which are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers - Preformed, compressible, resilient, nonwaxing, nonextruding strips of flexible, nonglassing plastic foam of material indicated below; nonabsorbent to water and gas; and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Either open cell polyurethane foam or closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer, for cold-applied sealants only.
- C. Bond-Breaker Tape - Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

- A. Primer - Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.
- B. Cleaners for Nonporous Surfaces - Provide nonstaining, chemical cleaners of type which are acceptable to manufacturer of sealants and sealant backing materials, which are not harmful to substrates and adjacent nonporous materials, and which do not leave

oil residues or otherwise have detrimental effect on a sealant adhesion or in-service performance.

- C. Masking Tape - Provide nonstaining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints - Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturers and the following requirements.
 1. Remove all foreign material from joint substrates, which could interfere with adhesion of joint sealant.
 2. Clean concrete joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 3. Remove laitance and form release agents from concrete.
 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other nonporous surfaces by chemical cleaners or other means, which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- B. Joint Priming - Prime joint substrates as recommended by joint sealant manufacturer. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape - Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General - Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Elastomeric Sealant Installation Standard - Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Installation of Sealant Backings - Install sealant backings to comply with the following requirements:

1. Install joint-fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths, which allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint-fillers.
 - b. Do not stretch, twist, puncture or tear joint fillers.
 - c. Remove absorbent joint fillers, which have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants and joint fillers, compression seals or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
 3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.
- D. Installation of Sealants - Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants - Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform bends of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Do not use tooling agents, which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Provide concave joint configuration per Figure 5A in ASTM C1193, unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

JOINT SEALER SCHEDULE

Joint Sealants	Description of joint construction and location where sealant is typically applied (see note below).
One-Part Non-Acid Curing-Silicone Sealant	Exterior and interior joints in horizontal and vertical surfaces of concrete and masonry; between concrete masonry; between metal and

JOINT SEALER SCHEDULE

concrete, mortar; perimeters of metal frames in exterior walls; overhead or ceiling joints; horizontal joints and foundation joints in vertical wood siding; joints where vertical wood siding adjoins concrete.

Provide a joint seal at all joints subject to weather infiltration whether shown or scheduled. Joints not shown or scheduled shall receive a joint sealant as selected by the Engineer from the sealants listed above.

END OF SECTION

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SECTION 08 51 13

ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes – Provide materials, labor, and equipment necessary to complete the work of this section, including, but not limited to:
 - 1. Furnishing and installing factory-glazed aluminum windows including:
 - a. Fixed Windows
 - b. Project-Out Casement Windows
 - 2. Aluminum trim and panning
- B. Related Sections:
 - 1. Section 07 62 00 – Sheet Metal Flashing and Trim
 - 2. Section 07 92 00 – Joint Sealants

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM E783
 - 2. ASTM E330
 - 3. ASTM E547
 - 4. ASTM E1105
- B. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA 101
 - 2. AAMA 605.2
 - 3. AAMA 701.2
 - 4. AAMA 901
 - 5. AAMA 904
 - 6. AAMA 1503.1

1.3 DEFINITIONS

- A. Performance class number, included as part of the window designation system, is the actual design pressure in pounds force per square foot used to determine structural test pressure and water test pressure.
 - 1. Structural test pressure, wind load test, is equivalent to 150 percent of the design pressure.

2. Water-leakage-resistance test pressure is equivalent to 20 percent of the design pressure with 6.24 lbf/sq. ft. as a minimum.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum windows engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assemblies representing types, grades, classes, and sizes required for Project according to test methods indicated.
- B. Test Criteria: Testing shall be performed by a qualified independent testing agency based on the following criteria:
 1. Test Procedures: Test window units according to ASTM E 783 for air infiltration, both ASTM E 1105 and ASTM E 547 for water penetration, and ASTM E 330 for structural performance.
- C. Performance Requirements: Testing shall demonstrate compliance with requirements indicated in AAMA 101 for air infiltration, water penetration, and structural performance for type, grade, and performance class of window units required. Where required design pressure exceeds the minimum for the specified window grade, comply with requirements of AAMA 101, Section 3, "Optional Performance Classes," for higher than minimum performance class.
 1. Windows shall conform to all AAMA/WDMA/CSA 101/I.S.2/A440-08 requirements for Performance Class AW, Performance Grade 40. The maximum size tested in rating any given window type shall be at least as large as the largest of its type scheduled for use on this project. In addition, the following specific performance requirements shall be met.
 2. Factory Air Infiltration Test
 - a. With ventilators closed and locked, test unit in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 or NFRC 400.
 - b. Air infiltration shall not exceed .10 cfm/SF of unit at a static air pressure difference of 6.24 psf or .30 cfm/SF of unit at a static air pressure difference of 12.0 psf.
 3. Water Resistance Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 1105 at a minimum static air pressure difference of 12.0 psf.
 4. Uniform Load Structural Test
 - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 up to a maximum static air pressure difference of 60 psf, both positive and negative.
 - b. Under the design load of 40 psf the maximum observed deflection measured across any overall dimension shall be L/175.
 - c. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable. There

shall be no permanent deflection of any mainframe, sash, sash member, leaf or threshold / sill in excess of 0.3% of its span.

5. Forced Entry Resistance
 - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.
6. Condensation Resistance Test (CRF)
 - a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than 62 when glazed with 0.24 center of glass U factor.
7. Thermal Transmittance Test (Conductive U-Value)
 - a. With ventilators closed and locked, test unit in accordance with AAMA 1503.01.
 - b. Conductive thermal transmittance (U-Value) shall not be more that 0.38 BTU/hr•ft²•°F for fixed windows or 0.45 BTU/hr•ft²•°F for operable windows when glazed with 0.24 center of glass U factor.
8. Solar Heat Gain Coefficient (SHGC)
 - a. Solar heat gain shall be for all windows shall be a maximum of 0.40.

D. Project Wind Loads

1. Wind Speed Project Site: 140 mph.
2. Exposure: Exposure "C"
3. Building Importance Factor: Category III
4. Design Wind Pressure (ASCE7-10, Components & Cladding, Service): 36 PSF

1.5 SUBMITTALS

A. In accordance with Section 01 33 00, the following shall be submitted:

1. Production schedule: Submit manufacturer’s production schedule to confirm that delivery will be received within 4 months of release of shop drawings.
2. Complete materials list of all items proposed to be furnished and installed under this Section
3. Manufacturer's specifications and other information required to demonstrate compliance with the specified requirements
4. Provide schedule of windows using same reference number for details and openings as those on the Drawings
5. Progress schedule including dates for field testing in accordance with Part 3.3.
6. Indicate coordination of glazing frames and stops with glass and glazing requirements

7. Manufacturer's printed installation procedures
8. Manufacturer's project references
9. Shop Drawings:
 - a. Layout and installation details, including anchors
 - b. Elevations at 1/4 inch = 1 foot scale and typical window unit elevations at 3/4 inch = 1 foot scale
 - c. Full-size section details of typical composite members, including reinforcement and stiffeners
 - d. Location of weep holes
 - e. Air/vapor barrier integration
 - f. Panning details
 - g. Hardware, including operators
 - h. Window cleaning provisions
 - i. Glazing details
 - j. Accessories
 - k. Provide manufacturer's verification that they have reviewed the details shown in the shop drawings and confirmed that their performance ratings and warranties will apply to the specific installation as shown therein.
10. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties
 - a. Test reports in accordance with Part 1.4 C shall be submitted for purposes of product approval.
11. Submit two samples for initial color selection on 12-inch-long sections of window frame and on two 3-inch by 5-inch samples of each manufacturer's standard color and texture available for insulated spandrel panels. Where finishes involve normal color variations, include sample sets showing the full range of variations expected.
12. Samples for Verification: The Engineer reserves the right to require additional samples that show fabrication techniques, workmanship, and design of hardware and accessories.
13. Product warranty
14. Manufacturers' maintenance manuals

1.6 QUALITY ASSURANCE

- A. Test reports from a qualified independent testing agency indicating that each type, grade, and size of window unit complies with performance requirements indicated based on comprehensive testing of current window units within the last 5 years. Test results based on use of down-sized test units will not be accepted.

- B. **Installer Qualifications:** Engage an experienced Installer who has completed installation of aluminum windows similar in material, design, and extent to those required for this Project and with a record of at least three projects of similar scope and type exhibiting successful in-service performance within the last 5 years.
- C. **Single-Source Responsibility:** Obtain aluminum windows from one source and by a single manufacturer.
- D. **Preconstruction Meeting:** The GC shall coordinate and participate in a building enclosure preconstruction meeting prior to the start of the building enclosure construction. The meeting shall include the BECxA, Owner or Owner’s Project Manager, Architect, and a qualified representative (foreman, site superintendent, or project manager) from each building enclosure subcontractor. Verify project requirements, substrate conditions, manufacturer’s installation instructions and manufacturer’s warranty requirements.
- E. **Mockups:** Prior to installing aluminum windows, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
 - 1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by the Engineer.
 - 2. Notify Engineer one week in advance of the dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Perform required air and water testing prior to installation.
 - 5. Obtain Engineer's approval of mockups before start of final unit of Work.
 - 6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.7 PROJECT CONDITIONS

- A. **Field Measurements:** Check window openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. The window contractor shall field verify locations, sizes and window types that are to be replaced before submitting shop drawings.

1.8 WARRANTY

- A. **General Warranty:** The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

- B. Special Warranty: Submit a written warranty signed by aluminum window manufacturer agreeing to repair or replace window components that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
 - 2. Faulty operation of sash and hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period: 10 years after date of Substantial Completion.
- D. Warranty Period for Metal Finishes and Glass: 20 years after date of Substantial Completion.
- E. Contractor's Warranty: Provide a warranty for all work under this Section in a document stating that if, within two years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. Also, state that the Contractor shall bear all costs incurred by the Owner, including reasonable attorney's fees, to enforce compliance with the obligation of this Warranty. The obligation of this Warranty shall run directly to the Owner, may be enforced by the Owner against the Contractor, shall survive the termination of the Contract, and shall not be limited by conditions other than this contract.

1.9 PROTECTION

- A. Use all means necessary to protect all materials of this Section before, during and after installation and to protect installed work and materials of all other trades.
- B. Deliver all materials to the jobsite in their original unopened containers with all labels intact and legible at the time of use. Store in strict accordance with the manufacturer's recommendations as approved by the Engineer.
- C. Maintain a weathertight building throughout construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following:
 - 1. EFCO Corporation, Monett, MO
 - 2. Wausau Window and Wall Systems, Wausau, WI
 - 3. Kawneer North America, Norcross, GA
 - 4. Approved equal
- B. Manufacturer Scheduling and Product Delivery

1. Selected manufacturer must be able to provide products within 4 months of shop drawing release.

2.2 MATERIALS

- A. Aluminum Extrusions: Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength and not less than 0.125 inch thick at any location for main frame and sash members.
- B. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.
 1. Reinforcement: Where fasteners screw anchor into aluminum less than 0.125 thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, noncorrosive, pressed-in, splined grommet nuts.
 2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate. Seal all exposed fasteners.
- C. Anchors, Clips, and Window Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with requirements of ASTM B 633; provide sufficient strength to withstand design pressure indicated.
- D. Glazing: Provide glazing and associated materials in accordance with Section 08 80 00 - Glazing.
- E. Insulated Spandrel Panels: Laminated, metal-faced flat panels with no deviations in plane exceeding 0.8 percent of panel dimension in width or length.
 1. Overall Panel Thickness: 1 inch.
 2. Exterior Skin: Aluminum.
 - a. Thickness: Manufacturer's standard for finish and texture indicated.
 - b. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
 - 1) Color and Gloss: As selected by Owner from manufacturer's full range.
 - c. Texture: Smooth.

- d. Backing Sheet: 1/8-inch-thick, tempered hardboard
 - 3. Interior Skin: Aluminum.
 - a. Thickness: Manufacturer's standard for finish and texture indicated.
 - b. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
 - 1) Color and Gloss: As selected by Owner from manufacturer's full range.
 - c. Texture: Smooth.
 - d. Backing Sheet: 1/8-inch-thick, tempered hardboard
 - 4. Thermal Insulation Core: Manufacturer's standard rigid, closed-cell, polyisocyanurate board.
 - 5. Surface-Burning Characteristics: For exposed interior surfaces of panels, when tested according to ASTM E 84 as follows:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 6. Fire Propagation Characteristics: Panels shall be approved under NFPA 285.
 - 7. Contractor shall supply the Owner with one panel of each size used for the project as extra stock.
- F. Compression-Type Glazing Strips and Weatherstripping: Unless otherwise indicated, and at manufacturer's option, provide compressible stripping for glazing and weatherstripping such as molded EPDM or neoprene gaskets complying with ASTM D 2000 Designation 2BC415 to 3BC620, or molded PVC gaskets complying with ASTM D 2287, or molded expanded EPDM or neoprene gaskets complying with ASTM C 509, Grade 4.
- G. Sliding-Type Weatherstripping: Provide woven-pile weatherstripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701.2.
- 1. Provide stripping with integral centerline barrier fin of semi-rigid plastic sheet of polypropylene.
- H. Sealant: For sealants required within fabricated window units, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, non-shrinking, and non-migrating. Comply with Section 07 92 00 - Joint Sealants for selection and installation of sealants.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessories that comply with indicated standards.
- B. Insect Screens: Provide insect screens for each operable exterior sash where security screens are not provided. Locate screens on exterior or interior of window sash or ventilator depending on window operation. Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches.
 - 1. Aluminum Tubular Frame Screens: Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," Architectural C-24 class.
 - 2. Screen Frames: Fabricate frames of tubular-shaped, extruded- or formed-aluminum members of 0.050-inch-minimum wall thickness, with mitered or coped joints and concealed mechanical fasteners. Finish frames to match window units.
 - 3. Sill and Sill Clips: Sills to be prefinished to match the window frame. Clips to be anchored to sub-straight with stainless steel anchors.
 - 4. Finish: Match aluminum window members.
 - a. Aluminum wire fabric: 18 by 16 mesh of .011 inch diameter, coated aluminum wire.
 - b. Wire fabric finish: Charcoal gray.

2.4 WINDOWS

- A. Window must be AAMA accredited and contain AAMA "Notice of Product Certification" indicating that windows conform to AAMA/WDMA/CSA 101/I.S.2/A440-08.
 - 1. Performance Class and minimum Performance Grade: AW 40

2.5 HARDWARE

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash or ventilator weight and dimensions. Do not use aluminum in frictional contact with other metals. Where exposed, provide solid bronze.
- B. Four Bar Friction Hinges: Comply with AAMA 904.
 - 1. Locking mechanism and handles for manual operation.
 - 2. Friction Shoes: Provide friction shoes of nylon or other nonabrasive, non-staining, non-corrosive, durable material.

2.6 FABRICATION

- A. General: Fabricate aluminum window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.

1. Provide units that are reglazable without dismantling sash or ventilator framing.
- B. Thermally Broken Construction: Fabricate window units with an integral, concealed, low-conductance, thermal barrier, located between exterior materials and window members exposed on interior, in a manner that eliminates direct metal-to-metal contact.
1. Provide thermal-break construction that has been in use for not less than 3 years, has been tested to demonstrate resistance to thermal conductance and condensation, and has been tested to show adequate strength and security of glass retention.
 2. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
 3. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated.
 4. Glazing Stops: Provide screw-applied or snap-on glazing stops, coordinated with glass selection and glazing system indicated. Finish to match window units.
 - a. Provide a continuous heel bead of sealant at the base of the glazing channel wherever removable stops are used.
- C. Preglazed Fabrication: Preglaze window units at the factory. Comply with glass and glazing requirements of Section 08 80 00 Glazing and AAMA 101.

2.7 FINISHES

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- C. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
 1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
 2. Color and Gloss: Selected by Owner.

PART 3 EXECUTION

3.1 INSPECTION

- A. Inspect openings before installation. Verify that rough or masonry opening is correct and sill plate is level.
 - 1. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.
 - 2. Metal surfaces shall be dry; clean; free of grease, oil, dirt, rust and corrosion, and welding slag; without sharp edges or offsets at joints.

3.2 INSTALLATION

- A. Comply with manufacturer's specifications and recommendations for installing window units, hardware, operators, and other components of the Work.
- B. Set window and screen units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
 - 1. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified under "Dissimilar Materials" Paragraph in appendix to AAMA 101.
- C. Set sill members and other members in a bed of sealant or with joint fillers or gaskets, as shown on Shop Drawings, to provide weathertight construction. Refer to Section 07 92 00 - Joint Sealants for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the Work.
 - 1. Sealants, joint fillers, and gaskets to be installed after installation of window units are specified in Section 07 92 00.
 - 2. Fill gaps between the window frame and subframe and the rough opening with continuous mineral wool insulation.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall engage a qualified independent testing and inspecting agency to perform the required field tests and inspections of installed units. Contractor shall include the cost for the field quality control in his bids.
- B. Perform air, water and sealant testing on all windows. The Engineer shall observe all tests and the manufacturers technical representative shall be present for all testing.
- C. Submit results of ASTM E783, ASTM E1105, and ASTM C1521 testing as applicable for the specified and approved systems.
- D. Remove, repair or replace the applicable systems, where test results indicate that they do not comply with the specified requirements.
- E. Additional testing and inspection shall be performed at the Contractor's expense to determine compliance of replaced or repaired work, following the completion of repairs or replacement.
 - 1. Following a failed test, the Contractor shall determine and correct any condition contributing to the failure at no additional cost to the Owner.

2. In the event of a failed test, the Contractor shall perform additional tests at no additional cost to the Owner following repairs performed to correct conditions contributing to the pervious failure.
- F. Testing Services: Testing and inspecting of installed windows shall take place as follows:
1. Air infiltration: Testing of windows shall be performed with sash in a closed and locked position according to ASTM E 783.
 - A. Air infiltration on operable and fixed windows shall not exceed 0.2 cfm per square foot of window area when tested in a static pressure drop of 6.24 psf.
 2. Water resistance: Testing of windows shall be performed with sash in a locked and closed position according to ASTM E 1105, Procedure B.
 - A. The window shall be subjected to a pressure differential equal to or greater than the Manufacturer’s specified test pressure or 12 PSF.
 - B. “Water leakage” shall be defined as any water inboard of the glass or the drainage plane of the assembly.
 3. Operable windows shall be tested via cyclic application of test pressure per the testing standards identified above. Testing via static pressure difference will be acceptable for fixed windows.
 4. Testing Plan – General Contractor shall submit a performance testing plan for review prior to initiation of field testing activities. Plan shall be submitted a minimum of two weeks prior to first test date.

3.4 CLEANING

- A. Clean aluminum surfaces promptly after installing windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.
- B. Clean glass of preglazed units promptly after installing windows. Comply with requirements of Section 08 80 00 for cleaning and maintenance.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to aluminum window manufacturer, that ensure window units are without damage or deterioration at the time of Substantial Completion.

END OF SECTION

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SECTION 08 80 00

GLAZING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes – Provide materials, labor, and equipment necessary to complete the work of this section, including, but not limited to:
 - 1. Factory-Glazed Window Units
- B. Related Sections
 - 1. Section 07 92 00 – Joint Sealants
 - 2. Section 08 51 13 – Aluminum Windows

1.2 REFERENCES

- A. Glass Association of North America (GANA)
 - 1. GANA Glazing Manual
 - 2. GANA Sealant Manual
- B. American National Standards Institute (ANSI) - Z97.1
- C. Federal Regulations - 16CFR Part 1201
- D. ASTM C162 - Standard Terminology of Glass and Glass Products
- E. ASTM C864 - Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers
- F. ASTM C920 – Standard Specification for Elastomeric Joint Sealants
- G. ASTM C1036 - Standard Specification for Flat Glass
- H. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
- I. ASTM E774 – Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units
- J. ASTM E2010 – Standard Test Method for Positive Pressure Fire Tests of Window Assemblies
- K. British Standards Institution (BSI) – BS EN 14179 Glass in Building – Heat-Soaked Thermally-Toughened Soda Lime Silicate Safety Glass

1.3 SYSTEM DESCRIPTION AND GLAZING SCHEDULE

- A. Provide glass and glazing that has been produced, fabricated and installed to withstand normal thermal movement, wind loading and impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials and other defects in the work.

1. Normal thermal movement is defined as that resulting from an ambient temperature range of 120°F (67°C) and from a consequent temperature range within glass and glass framing members of 180°F (100°C).
 2. Deterioration of insulating glass is defined as failure of hermetic seal due to causes other than breakage which result in intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coating, if any, resulting from seal failure, and any other visual evidence of seal failure or performance.
- B. Glazing Schedule - All aluminum windows shall be glazed with sealed insulating glass units as specified in section 2.6

1.4 SUBMITTALS

- A. Product Data - Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.
- B. Samples - Submit, for verification purposes, 12-inch square samples of each type of glass and insulated panel indicated except for clear single pane units, and 12-inch long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket samples between two strips of material representative of adjoining framing system in color.
- C. Certificate - Submit certificates from representative manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
 1. Separate certification will not be required of glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.
- D. Compatibility and Adhesion Test Report - Submit statement from sealant manufacturer indicating that glass and glazing materials have been tested for compatibility and adhesion with glazing sealants and interpreting test results relative to material performance, including recommendations for primers and substrate preparation needed to obtain adhesion.

1.5 QUALITY ASSURANCE

- A. Glazing Standards - Comply with recommendations of GANA Glazing Manual and Sealant Manual except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.
- B. Insulating Glass Certification Program - Provide insulating glass units permanently marked either on spacers or at least one component pane of units with appropriate certification label of inspecting and testing organization indicated below:
 1. Insulating Glass Certification Council (IGCC), or
 2. Associated Laboratories, Inc. (ALI).

- C. Single Source Responsibility - Provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.
- D. Preconstruction Compatibility and Adhesion Testing - Submit samples of all glass, gaskets, glazing accessories, and glass framing members proposed for use in contact with, or proximity of, glazing sealants, to sealant manufacturer for compatibility and adhesion testing in accordance with sealant manufacturer's standard testing methods and the following requirements:
 - 1. Submit not less than 3 pieces of each type and finish of glass framing member and of each type, class, kind, condition, and form (monolithic, laminated, insulating units) of glass for adhesion testing and one sample of substrates (gaskets, setting blocks and spacers) for compatibility testing.
 - 2. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the Work.
 - 3. Investigate materials failing compatibility or adhesion tests and obtain sealant manufacturer's written recommendations for corrective measures, including use of specially formulated primers.
- E. Fenestration Water and Air Penetration Resistance Testing – Water and air testing of windows, storefront, and curtain wall systems shall be performed in accordance with the requirements of their respective sections.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, temperature changes, and direct exposure to sun.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions - Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.8 WARRANTY

- A. General - Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.
- B. Manufacturer's Special Project Warranty on Insulating Glass - Provide written warranty signed by manufacturer of insulating glass agreeing to furnish and install, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure of hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.

1. Warranty Period - Manufacturer's standard but not less than 10 years after date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers - Subject to compliance with requirements, provide products of one of the following:
 1. PPG Industries, Inc.
 2. AFG Industries, Inc.
 3. Cardinal IG.
 4. Ford Glass Division.
 5. Guardian Industries Corp.
 6. or equal.

2.2 GLASS PRODUCTS, GENERAL

- A. Heat Treated Glass Standard - Provide heat-treated glass which complies with ASTM C1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern. Heat treated glass includes heat strengthened and fully tempered glass.
- B. Tinted Glass Standard – Provide tinted glass which complies with ASTM 1036 requirements.
- C. Safety Glazing Standard – Where required by the drawings, provide glazing assemblies that comply with CPSC 16 CFR 1201, Category II. Safety glazing shall be heat-strengthened or laminated, as needed to comply with CPSC 16 CFR 1201 as described above. Fully tempered glass will not be allowed.
- D. Sizes - Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.3 HEAT-TREATED GLASS PRODUCTS

- A. Manufacturing Process - Manufacture heat-treated glass as follows:
 1. By horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.
- B. Heat-treated glass shall meet the requirements of ANSI Z97.1 for safety glass.
- C. Low-E Heat-Strengthened Glass:
 1. ASTM C1048, Kind HS, Condition C, Type I, Class 1, Quality q3 with low emissivity pyrolytic coating having an E of 0.15.
 2. Apply coating to third surface of insulating glass units.
 3. Thickness: ¼ inch.

- D. Tinted Heat-Strengthened Glass:
 - 1. ASTM C1048, Kind FT, Condition A, Type I, Class 2, Quality q3.
 - 2. Color: As chosen by Owner.
 - 3. Thickness: ¼ inch.

2.4 LAMINATED GLASS PRODUCTS

- A. Two or more lites of glass bonded with an interlayer material for use in building glazing.
- B. Colored Interlayer:
 - 1. Use color interlayer ultraviolet light color stabilization.
 - 2. Option: Use colored interlayer with clear glass in lieu of tinted glass and clear interlayer.
 - 3. The interlayer assembly shall have uniform color presenting same appearance as tinted glass assembly.
- C. Use 0.060-inch thick interlayer for heat-strengthened glass assemblies.

2.5 LAMINATED GLAZING ASSEMBLIES

- A. Laminated glazing assemblies shall be used where required to meet safety glazing requirements.
- B. Low-E Heat-Strengthened Glazing:
 - 1. Pane facing Surface 3 - ASTM C1048, Kind HS, Condition C, Type I, Class 1, Quality q3, with low emissivity pyrolytic coating having an E of 0.15.
 - 2. Pane facing Surface 4 – ASTM C1048, Kind HS, Condition A, Type I, Class 1, Quality q3.
 - 3. Thickness: Each pane, 1/8 inch.
 - 4. Provide translucent, frosted glass at toilet room windows.
- C. Tinted Heat-Strengthened Glazing:
 - 1. Both panes, ASTM C1048, Kind HS, Condition A, Type I, Class 2, Quality q3.
 - 2. Color: As chosen by Owner.
 - 3. Thickness: Each pane, 1/8 inch.

2.6 SEALED INSULATING GLASS UNITS

- A. For all exterior windows, provide insulating glass units complying with the following requirements unless noted otherwise on the project drawings:
 - 1. Exterior Pane – Tinted, heat-strengthened or laminated glass.
 - a. Color: as selected by Owner.
 - 2. Interior Pane – Low-E, heat-strengthened or laminated glass.

3. Visible Light Transmittance – Provide units with a minimum visible light transmittance of 55%.
 4. Where safety glass is specifically required by the Plans, that glass shall be labeled in accordance with Part 2406.2 of the Connecticut State Building Code. Safety glass shall comply with testing requirements in 16 CFR 1201 for Category II materials.
- B. General - Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with the requirements of ASTM E774 and E2190 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, spacer material, corner design and desiccant.
1. For properties of individual glass panes making up units, refer to product requirements specified in Part 2.1 through 2.5 of this section.
 2. Performance Classification per ASTM E774, Class A.
 - a. Thickness of Interior Pane – ¼ inch (5/16 inch for laminated glass).
 - b. Thickness of Exterior Pane – ¼ inch (5/16 inch for laminated glass).
 - c. Air Space Thickness – ½ inch (3/8 inch for laminated glass).
 - d. Total Insulating Glass Panel Thickness – 1 inch.
 - e. Sealing System - Manufacturer's standard with butyl primary seal and silicone secondary seal.
 - f. Spacer Material - Manufacturer's standard closed stainless steel dual seal spacer.
 - g. Desiccant - Manufacturer's standard; either molecular sieve or silica gel or blend of both.
 - h. Corner Construction – Spacers shall be constructed with four bent corners and one straight key joint.
 3. Center of Glass U value shall be a maximum of 0.24, or lower if required to meet total system performance requirements for aluminum windows, aluminum entrances and storefront, and aluminum curtain wall assemblies.

2.7 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES

- A. General - Provide products of type indicated and complying with the following requirements:
- B. Compatibility - Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of insulation and service, as demonstrated by testing and field experience.
 1. Suitability - Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for application indicated and conditions at time of installation.

2. Elastomeric Sealant Standard - Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C920 requirements, including those for Type, Grade, Class and Uses.
 3. Colors - Provide color of exposed sealants indicated as selected by Engineer from manufacturer's standard colors.
- C. Preformed Butyl-Polyisobutylent Glazing Tape - Provide manufacturer's standard solvent-free butyl-polyisobutylene formulation with a solids content of 100%; in extruded tape form; non-staining and non-migrating in contact with nonporous surfaces; packaged on rolls with a release paper on one side; with or without continuous spacer rod as recommended by manufacturers of tape and glass for application indicated.
1. Glazing Tape without Spacer Rod:
 - a. "Chem-Tape 40"; Bostik Construction Products Div.
 - b. "Extru-Seal"; Pecora Corp.
 - c. "PTI 303" Glazing Tape; Protective Treatments, Inc.
 - d. "Tremco 440 Tape"; Tremco, Inc.
 - e. or equal.
 2. Glazing Tape With Spacer Rod:
 - a. "Chem-Tape 60"; Bostik Construction Products
 - b. "Shim-Seal"; Pecora Corp.
 - c. "PTI 303" Shim Tape; Protective Treatments, Inc.
 - d. "Pre-shimmed Tremco 440 Tape"; Tremco, Inc.
 - e. or equal.
- D. One-Part Acid - Curing silicone Glazing Sealant: type S; Grade NS; Class 25; Uses NT, G, A, and as applicable to uses indicated, O:
1. Subject to compliance with requirements, provide one of the following:
 - a. One-Part Acid-Curing Silicone Glazing Sealant;
 - b. "Chem-Calk 1200"; Bostik Construction Div.
 - c. "Dow Corning 999"; Dow Corning Corp.
 - d. SCS 1200"; General Electric Corp.
 - e. "863"; Pecora Corp.
 - f. "Rhodorsil 3B"; Rhone-Poulenc, Inc.
 - g. "Omniglaze"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
 - h. Proglaze"; Tremco

- i. or equal.

2.8 GLAZING GASKETS

- A. Dense Elastomeric Compression Seal Gaskets - Molded or extruded neoprene gaskets of material indicated below, complying with ASTM C864, or profile and hardness required to maintain watertight seal.
- B. Manufacturers - Subject to compliance with requirements, provide products of one of the following:
 - 1. Manufacturers of Preformed Gaskets:
 - a. D.S. Brown Co.
 - b. Maloney Precision Products Co.
 - c. Tremco.
 - d. or equal.

2.9 MISCELLANEOUS GLAZING MATERIALS

- A. Compatibility - Provide materials with proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers - Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks - Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.
- D. Spacers - Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
- E. Edge Blocks - Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.
- F. Compressible Filler Rods - Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25% deflection.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Furnish written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Pre-Installation Meeting - At Engineer's direction, Contractor, sealant and gasket manufacturers' technical representative, glass framing erector and other trades whose work affects glass and glazing shall meet at project site to review procedures and time schedule proposed for glazing and coordination with other work.
- B. Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.3 GLAZING, GENERAL

- A. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.
- B. Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.
- C. Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

3.4 GLAZING

- A. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, butt with edge nearest corner not closer than 6 inches from corner unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.
- B. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8 inch minimum bit of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- C. Provide edge blocking as required by glass unit manufacturer.
- D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- E. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

- F. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
- G. Tool exposed surfaces of sealants to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
- H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.
- I. Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corner; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.5 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.
- B. Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.

END OF SECTION

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SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Surface preparation and application of coatings

1.2 REFERENCES

A. The Society for Protective Coatings (SSPC):

1. Surface Preparation Specifications

- a. SP-1 - Solvent Cleaning
- b. SP-2 - Hand Tool Cleaning
- c. SP-3 - Power Tool Cleaning
- d. SP-5 - White Metal Blast Cleaning
- e. SP-6 - Commercial Blast Cleaning
- f. SP-7 - Brush-Off Blast Cleaning
- g. SP-10 - Near-White Blast Cleaning
- h. SP-13 – Surface Preparation of Concrete

2. SSPC-PA 1 – Shop, Field and Maintenance Painting

3. SSPC-PA 2 - Measurement of Dry Coating Thickness with Magnetic Gages

4. SSPC Visual Standards SSPC VIS 1-89

B. Occupational Safety and Health Administration (OSHA) Standards

1.3 SCOPE OF WORK

A. Items of work include, but are not limited to, the surface preparation and coating of the following:

1. Wood trim, casings, and stools around window openings

B. Ventilation and dehumidification equipment required to provide and maintain the proper environment for worker protection and for coating application and curing.

1.4 SUBMITTALS

A. List of coating products and systems proposed, giving brand, type and manufacturer

B. Manufacturer's current printed recommendations and product data sheets for each system

- C. Paint manufacturer's Compatibility Guide, to be a complete listing of all compatible paint systems/combinations produced by the paint manufacturer
- D. Copies of manufacturer's complete color charts for each coating system
- E. When requested by the Engineer, provide product container labels and labeled mixing instructions for products utilized in the Work.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications – Minimum 5 years' experience in application of specified products.
- B. Regulatory Requirements – Meet federal, state and local requirements limiting the emission of volatile organic compounds.
- C. A qualified and experienced representative of the paint manufacturer shall meet with Contractor and Engineer to coordinate items requiring painting and to schedule the Work. Monthly field visits shall occur to ensure proper application of the painting system.

1.6 DELIVERY, HANDLING, STORAGE AND PROTECTION

- A. Deliver materials to painter's area in original, unbroken, containers with name and analysis of product, manufacturer's name, and shelf life date. Do not use or retain contaminated, outdated, prematurely opened, or diluted materials.
- B. Store coated items carefully. Store paints and painter's materials only in areas designated solely for this purpose. Avoid damaging or dirtying coatings by contact with soil, pavement or other harmful materials that might necessitate special cleaning. Use suitable blocking during storage.
- C. Confine mixing, thinning, clean-up and associated operations, and storage of painting debris before authorized disposal, to these areas.
- D. Do not expose primed surfaces to weather for more than six months before top coating. Allow less time if recommended by coating manufacturer.
- E. Do not use plumbing fixtures, piping or mechanical equipment for mixing or disposal of paint materials.
- F. Store waste temporarily in closed, nonflammable containers until final disposal. Keep no rubbish in painter's area longer than 24 hours. Finally, dispose of waste in an approved disposal system.
- G. During surface preparation, cleaning and painting operations, protect all surfaces not to be painted.
- H. Protect coated items, whether prime or finish, from damage due to shipping and handling. Use padding, blocking, fabric slings and extra care as required.
- I. Upon completion of field painting, ensure coatings are undamaged and in good condition. Repair damaged or deteriorated coating, resulting from failure to observe foregoing requirements.

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied.
 - 2. Do not apply coatings when dust is being generated.
- B. Cover or otherwise protect work by other trades and surfaces not being painted during all painting operations.
- C. All shop primed ferrous metals shall be primed using the same coatings specified in the paint schedule.

1.8 EXTRA MATERIALS

- A. Provide one spare paint container (1 gal) for each type and color applied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Painting materials are designated by reference to Tnemec Company, Inc. products to establish the type and quality required. Equivalent products as manufactured by Sherwin-Williams Company, International Protective Coatings or equal will be given consideration as a substitute.
- B. Substitutions of other manufacturers will be considered only if a "product for product" listing is submitted. The Engineer reserves the right to request and receive detailed technical literature of each proposed substitution before approving any alternatives.
- C. No substitutions will be considered that decrease the film thickness, the number of coats, the surface preparation or the generic type of coating specified.

2.2 MATERIALS, GENERAL

- A. Paint Coatings - Suitable for intended use, recommended by their manufacturer for intended service. All coatings, unless otherwise specified, shall be suitable for severe service.
- B. Products Used - Minimum of five years satisfactory use under similar service conditions
- C. Use products of one manufacturer in any one paint coating system; all coating materials compatible. Coatings for touch-up - same as original.
- D. Equipment prime or finish painted by the equipment manufacturer shall be painted in strict accordance with this Section and the equipment's individual specification section.
- E. Bear entire responsibility in providing complete compatibility of all shop and field painting systems.

2.3 COLORS AND FINISHES

- A. All finish colors will be selected from manufacturer's color chips. The Owner will select the colors. Match final colors to selected color chips, as scheduled.
- B. To provide contrast between successive coats, lightly tint each coat to distinguish it from preceding coats.
- C. Unless otherwise indicated, use gloss or semi-gloss for finish paint.

2.4 COATING TYPES

- A. Coatings are described in the Table 09 90 00-A Coating Schedule. Description of coating types includes minimum acceptable percent, by volume of component solids. Paint systems and dry film thicknesses are included in Table 09 90 00-B.

PART 3 EXECUTION

3.1 GENERAL

- A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into an acceptable condition through preparatory work.
- B. Do not proceed with surface preparation or coating application until conditions are suitable.
- C. The following shop and field instruments shall be used to inspect surface preparation and dry film thickness.
 - 1. SSPC visual standards SSPC-VIS 1-89
 - 2. Testex Press-O-Film replica type x-coarse
 - 3. Surface temperature thermometer
 - 4. Sling psychrometer and psychrometric tables
 - 5. Type I or Type II dry film thickness gauges
 - 6. SSPC-PA2 methods

3.2 PREPARATION

- A. Basic Steps
 - 1. Arrange to do all preparation and paint work in heated enclosure unless ambient weather conditions ensure still, dry air and 50-degree F temperature. Do not apply paints to surfaces in direct sunlight.
 - 2. Coordinate cleaning and painting operations to eliminate contamination of one by the other.
 - 3. Maintain all coating materials at manufacturer's recommended mixing and application temperatures for not less than 24 hours before use. Have clean, proper containers, spray equipment, applicators and accessory items ready for use before decanting or mixing paint materials.
 - 4. Ensure proper coordination of materials to be applied hereunder with previous coatings on affected surfaces. Have all manufacturer's written directions on hand, and follow them strictly, except where otherwise specified.

5. Carefully coordinate preparation and material compatibility requirements of paint systems used by manufacturers to shop prime equipment.
- B. Before any paint application, carefully clean all surfaces to be coated of dust, dirt, grease, rust, mill scale, paint unsuitable for top coatings, efflorescence, oil, moisture, foreign matter or conditions detrimental to coating bond and durability.
1. Following cleaning, apply preparatory treatment, if required, in strict accordance with manufacturer's written instructions.
- C. Metals
1. Prepare all field and shop primed ferrous metals, including galvanized ferrous metals, in accordance with Table 09 90 00-B Paint System Schedule included under this Section.
 2. A needle gun may be used for field welds and shop welds which occur in narrow, unprimed areas in an otherwise shop primed surface.
 3. Bituminous coated metals for paint finish - clean of all dirt, grease, oil and foreign matter, and prime with a barrier coat to seal the bitumen and prevent bleeding and discoloration of finish.
 4. Prepare non-ferrous and galvanized metal surfaces for finish; clean of all dirt, grease, oil and foreign substance, wash thoroughly with grease solvent, and then permit to dry. Apply coatings as outlined on the Paint Schedule.
- D. Provide higher degree of cleaning for acceptable equivalent paint products when paint manufacturer recommends in his printed surface preparation recommendations.
- E. Concrete for Paint Finishes
1. Clean thoroughly of all oil, dirt, dust, grease, paint, loose material and foreign matter in accordance with Table 09 90 00 B – Paint System Schedule included under this Section.
- F. Concrete unit masonry for paint finishes
1. Clean thoroughly of all oil, dirt, dust, grease, paint, loose material and foreign matter in accordance with Table 09 90 00 B – Paint System Schedule included under this Section.
- G. Before applying field coat, touch-up abraded areas of shop coats with paint of the same type. Apply an entire coat if necessary. Touch-up coats are in addition to, and not a substitute for first field coat. Clean deteriorated surfaces to bare metal before applying touch-up coat.
- H. After installation and before applying field coats, touch-up all scratches and blemishes on equipment, motors, pumps, instrumentation panels, electrical switchgear, and similar items with shop coats, paint filler, enamel or other treatment customary with manufacturer.
- I. After installation, touch up all scratches and blemishes on all steel.

3.3 APPLICATION

- A. Conditions

1. Do not apply paints or other finish to wet or damp surfaces, except in accordance with instructions of manufacturer. Do not apply exterior paint during cold, rainy, or frosty weather, or when temperature is likely to drop to freezing within the paint coatings curing time as specified by the paint manufacturer. Avoid painting of surfaces while they are exposed to direct sunlight.
2. Paint surfaces which have been cleaned, pretreated, or otherwise prepared for painting with first finish coat as soon as practicable after such preparation has been completed, but in any event prior to deterioration of prepared surface.
3. Coat blast cleaned metal surfaces immediately after cleaning, before any rusting or other deterioration or contamination of the surface occurs. Do not coat blast cleaned surfaces later than 8 hours after cleaning under ideal conditions or sooner if conditions are not ideal.
4. Work shall conform to SSPC-PA 1.

B. Methods

1. Prepare surfaces, mix and apply paint materials in strict accordance with manufacturer's printed instructions and recommendations, except where specifically directed otherwise. Control temperature of materials upon mixing and application, surface temperature and condition, thinning and modifying.
2. Protect surfaces to be coated, before, during and after application unless ambient weather conditions are favorable.

C. Workmanship

1. Apply coating materials to meet manufacturer's spreading rate and dry film thickness recommendations. Dry film thicknesses specified are constant for brush, spray, roller or other form of application.
 - a. Control thinning for spray use and to manufacturer's printed instructions, and produce specified dry film thickness on level surfaces, interior and exterior angles.
 - b. Record quantities of materials of each type, for each coat used.
2. Apply paints and coatings using skilled painters, brushed or rolled or sprayed out carefully to a smooth, even coating without runs or sags. Flow enamel on evenly and smoothly. Allow each coat of paint to dry thoroughly, on the surface and throughout the film thickness, before the next coat is applied. High polymer coatings may be exempted from the drying requirement if recoat time is specified by manufacturer.
3. Finish surfaces - Uniform in finish and color, and free from flash spots and brush marks
4. Accessory items, finish hardware, lighting fixtures, escutcheons, plates, trim and similar finish items not to be painted: Remove or carefully mask before painting adjacent surfaces; carefully replace and reposition upon completion of adjacent painting and cleaning work.

3.4 EXISTING SURFACES TO BE RECOATED

- A. Existing masonry, steel, concrete, precast concrete, metal doors, and other previously field painted surfaces so noted or scheduled shall be completely recoated.
- B. Surface preparation shall, be as specified in Table 09 90 00 B.
- C. Primer and paint used for a particular surface shall, in general, be as scheduled for that type of new surface. Confirm with the paint manufacturer that the paint proposed for a particular recoating condition will be compatible with the existing painted surface. Perform compatibility tests on existing substrates. Recoated areas shall be covered by the same guarantee specified for the remainder of the project.

3.5 PROTECTION, CLEAN-UP

- A. Protect all materials and surfaces painted or coated under this Section, from the time of surface preparation until the final coat has fully dried. Also protect all adjacent work and materials from touch-up painting by the use of sufficient dropcloths during the progress of this work. Upon completion of the work, clean up all paint spots, oil, and stains from floors, glass, hardware, and similar finished items.

3.6 PAINT SCHEDULE

- A. Coordinate, schedule and confirm the various cleaning, touch-up and finishing operations. Ensure the transmission of materials data, color selections and coating system methods between the coating applicators. Take responsibility for not exceeding exposure and recoat time limits.

3.7 FIELD QUALITY CONTROL

- A. Leave staging and lighting in place until the Engineer has inspected surface or coating. Replace staging removed prior to approval by the Engineer. Provide additional staging and lighting as requested by the Engineer.
- B. Unsatisfactory Application
 - 1. If surface has an improper finish color or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.
 - 2. Evidence of runs, bridges, shiners, laps or other imperfections is cause for rejection.
 - 3. Repair defects in accordance with written recommendations of coating manufacturer.

3.8 FINAL TOUCH-UP

- A. Prior to final completion and acceptance, examine painted and finished surfaces and retouch or refinish as necessary to leave surfaces in perfect condition.
- B. After doors have been fitted and hung, refinish edges, tops and bottoms.

TABLE 09 90 00-A
Coating Schedule

Tnemec Company Inc.	Description (Solids Content by Volume)
Series 2H Hi-Build Tneme-Gloss	Alkyd (49.0 ± 2.0%)
Series 6 Tneme-Cryl	Acrylic Emulsion (43.0 ± 2.0%)
Series 20 Pota-Pox	Polyamide Epoxy (56.0 ± 2.0%)
Series FC20 Pota-Pox (Fast Cure)	Polyamide Epoxy (58.0 ± 2.0%)
Series 23 Enduratone	Alkyd (56.0 ± 2.0%)
Series 36 Undercoater	Alkyd (56.0 ± 2.0%)
Series 39-1261 Silicone Aluminums	Silicone Aluminum (25.0 ± 2.0%)
Series 46-465 HB Tnemecol	Coal Tar (64.0 ± 2.0%)
Series 63-1500 Filler and Surfacer	Modified Amine Epoxy (100%)
Series 66 Hi-Build Epoxoline	Polyamide Epoxy (56.0 ± 2.0%)
Series N69 Hi-Build Epoxoline	Polyamidoamine Epoxy (69.0 ± 2.0%)
Series 73 Endura Shield	Aliphatic Acrylic Polyurethane (58.0 ± 2.0%)
Series 90-97 Tneme-Zinc	Aromatic Urethane, Zinc Rich (63.0 ± 2.0%)
Series 91-H2O Hydro-Zinc	Aromatic Urethane, Zinc Rich (63.0 ± 2.0%)
Series 113 Tneme-Tufcoat	Waterborne Acrylic Epoxy (44.0 ± 2.0%)
Series 120 Vinester	Vinyl Ester (89% theoretical)
Series 130 Envirofill	Waterborne Cementitious Acrylic (68.0 ± 2.0%)
Series 151 Elasto-Grip	Waterborne Modified Polyamine Epoxy (17.0 ± 2.0%)
Series 201 Epoxoprime	Modified Polyamine Epoxy (100%)
Series 218 MortarClad	Epoxy Modified Concrete (100%)
Series 219 MortarCast	Epoxy Modified Cement (100%)
Series 287 Enviro-Pox	Waterborne Epoxy – Amine Adduct
Series 434 Chembloc	Modified Aliphatic Amine Epoxy Mortar (100%)
Series 435 ChemGel	Modified Polyamine Epoxy (100%)
Series 594 Omnithane	MIO/Zinc-Filled Urethane (61.0 ± 2.0%)

TABLE 09 90 00-B
Paint System Schedule

T0377001/04/17/19	09 90 00-8	Painting and Coating
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Surface	Surface Preparation	Finishes		
		Primer DFT = Dry Film Thickness, Mils	2nd	Final
Ferrous Metals, Interior Non-Submerged	SSPC-SP-1 and lightly sand	Series 90-97 (2.5-3.5 DFT)	Series N69 (4.0-6.0 DFT)	Series 73 (2.5-5.0 DFT)
Non-Ferrous Metal (Other Than Galvanized), Interior and Exterior Non-Submerged	SSPC-SP-1 And lightly sand	Series 66 (3.0-5.0 DFT)		Series 73 (2.5-5.0 DFT)
Concrete Block Interior, Non Submerged	New or Unpainted: Broom Clean, Previously Painted: Broom clean and lightly sand	Series 130 (14-18 DFT)	Series 66 (3.0-6.0 DFT)	Series 66 (3.0-6.0 DFT)
Wood, Exterior or Interior	Sand Smooth & Remove Dust	Series 36 (2.0-3.5 DFT)	Series 23 (1.5-3.5 DFT)	Series 2H (1.5-3.0 DFT)
Gypsum Drywall	Sand Smooth and Remove Dust	Series 151 (1.0-1.5 DFT)	Series 113 (3.0-5.0 DFT)	Series 113 (3.0-5.0 DFT)

END OF SECTION

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SECTION 22 13 16

SANITARY WASTE AND VENT PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Vent piping systems
 - 2. Drains and drainage specialties

1.2 REFERENCES

- A. BOCA Basic National Plumbing Code.
- B. ASTM A74 - Specification for Cast Iron Soil Pipe and Fittings.
- C. ASTM B32 - Specification for Solder Metal.
- D. ASTM B306 - Specification for Copper Drainage Tube.
- E. ASTM C564 - Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- F. Cast Iron Soil Pipe Institute (CISPI).

1.3 DEFINITIONS

- A. Vent System - A pipe or pipes installed to provide a flow of air to or from a drainage system, or to provide a circulation of air within such system to protect trap seals from siphonage and back pressure.

1.4 SUBMITTALS

- A. Material specification and shop drawings for all materials and equipment furnished under this Section.
- B. Product data for the following products.
 - 1. Roof drains.
- C. Vent piping plan drawn to scale

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements - comply with the provisions of the following:
 - 1. BOCA Basic National Plumbing Code
 - 2. Connecticut Plumbing Code.

1.6 SEQUENCING

- A. Coordinate the installation of flashing and roof penetrations.
- B. Coordinate the installation of drains in poured-in-place concrete slabs, to include proper drain elevations, installation of flashing, and slope of slab to drains.

- C. Coordinate with installation of drainage systems as necessary to interface building drains with drainage piping systems installed under Division 2.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer - Subject to compliance with requirements, provide drainage and vent systems from one of the following or an approved equal:
 - 1. Drainage Piping Specialties, including expansion joints, drains, and vent caps:
 - a. Ancon, Inc.
 - b. Josam Mfg. Co.
 - c. Jay R. Smith Mfg. Co.
 - d. Tyler Pipe; Subs. of Tyler Corp.
 - e. Zurn Industries, Inc.; Hydromechanics Div.

2.2 MATERIALS

- A. Expansion Joints - Cast-iron body with adjustable bronze sleeve, bronze bolt and wing nuts.
- B. Flashing Flanges - Cast-iron watertight stack or wall sleeve with membrane flashing ring. Provide underdeck clamp and sleeve length as required.
- C. Vent Flashing Sleeves - Cast-iron caulking type roof coupling for cast-iron stacks, cast-iron threaded type roof coupling for steel stacks, and cast-bronze stack flashing sleeve for copper tubing.
- D. Frost-Proof Vent Caps - Construct of galvanized iron, copper, or lead-coated copper, sized to provide 1-inch air space between outside of vent pipe and inside of flashing collar extension.
- E. Vandal-Proof Vent Caps - Cast-iron body full size of vent pipe, with caulked base connection for cast-iron pipes, threaded base for steel pipes.
- F. Roof Drains
 - 1. Roof drain sizes shall be in conformance with ANSI Standard A112.21.1.
 - 2. Roof Drains - Provide each roof drain with a cast iron body, adjustable extension sleeve, underdeck clamp, sump receiver and 11-inch square grate. Roof drain shall be J.R. Smith Series 1410, or equivalent product by Josam, Zurn, or equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine rough-in requirements for plumbing fixtures and other equipment having drain connections to verify actual locations of piping connections prior to installation.
- B. Examine walls, floors, roof, and plumbing changes for suitable conditions where piping and specialties are to be installed.

- C. Do not proceed until unsatisfactory conditions have been corrected at no additional cost to the Owner.

3.2 INSTALLATION OF PIPING SPECIALTIES

- A. Install expansion joints on vertical risers as indicated, and as required by the plumbing code.
- B. Flashing Flanges - Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.
- C. Vent Flashing Sleeves - Install on stacks passing through roof, secure over stack flashing in accordance with manufacturer's instructions.
- D. Frost-Proof Vent Caps - Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1" clearance between vent pipe and roof substrate.

3.3 CONNECTIONS

- A. Piping Runouts to Fixtures - Provide drainage and vent piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by the plumbing code.
- B. Locate piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

3.4 PIPE APPLICATIONS - ABOVE GROUND, WITHIN BUILDING

- A. Above Ground, Within Building
 - 1. Install copper tube with cast bronze fittings for 3 inch and smaller, drainage and vent pipe. Solder joints in accordance with the procedures specified in AWS "Soldering Manual".
 - 2. Install hubless, service weight, cast-iron soil pipe and fittings for larger than 3-inch drainage and vent pipe. Make compression joints, and hubless joints in accordance with the recommendations in the CISPI Cast Iron Soil Pipe and Fittings Handbook, Chapter IV.

3.5 FIELD QUALITY CONTROL

- A. Inspections
 - 1. Do not enclose, cover, or put into operation drainage and vent piping systems until it has been inspected and approved by the authority having jurisdiction.
 - 2. During the progress of the installation, notify the plumbing official having jurisdiction, at least 24 hours prior to the time such inspection must be made. Perform tests specified below in the presence of the plumbing official.
 - a. Rough-in Inspection - Arrange for inspection of the piping system before concealed or closed-in after system if roughed-in, and prior to setting fixtures.
 - b. Final Inspection - Arrange for a final inspection by the plumbing official to observe the tests specified below and to ensure compliance with the requirements of the plumbing code.

3. Reinspections - Whenever the piping system fails to pass the test or inspection, make the required corrections, and arrange for reinspection by the plumbing official.
 4. Reports - Prepare inspection reports, signed by the plumbing official.
- B. Piping System Test - Test drainage and vent system in accordance with the procedures of the authority having jurisdiction, or in the absence of a published procedure, as follows:
1. Test for leaks and defects all new drainage and vent piping systems and parts of existing systems, which have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.
 2. Leave uncovered and unconcealed all new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose all such work for testing that has been covered or concealed before it has been tested and approved.
 3. Rough Plumbing Test Procedure - Except for outside leaders and perforated or open jointed drain tile, test the piping of plumbing drainage and venting systems upon completion of the rough piping installation. Tightly close all openings in the piping system, and fill with water to the point of overflow, but not less than 10 feet head of water. Water level shall not drop during the period from 15 minutes before the inspection starts, through completion of the inspection. Inspect all joints for leaks.
 4. Finished Plumbing Test Procedure - After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proved gas and water-tight. Plug the stack openings on the roof and building drain where it leaves the building, and introduce air into the system equal to a pressure of 1 inch water column. Use a "U" tube or manometer inserted in the trap of a water closet to measure this pressure. Air pressure shall remain constant without the introduction of additional air throughout the period of inspection. Inspect all plumbing fixture connections for gas and water leaks.
 5. Repair all leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.
 6. Prepare reports for all tests and required corrective action.

3.6 CLEANING

- A. Clean interior of piping system. Remove dirt and debris as work progresses.
- B. Clean drain strainers, domes, and traps. Remove dirt and debris.

3.7 PROTECTION

- A. Protect drains during remainder of construction period, to avoid clogging with dirt and debris, and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

END OF SECTION

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Tourtellotte Memorial High School/Mary Fisher Elementary School Roof Replacement DAS Project No. 141-022 RR

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. HVAC work includes:
 - 1. Removal and reinstallation of rooftop exhaust fans and ventilators
 - 2. Air System Ductwork
 - 3. Testing, adjusting, and balancing

1.2 REFERENCES

- A. International Building Code – IBC 2009
- B. The Connecticut State Building Code, latest edition
- C. International Mechanical Code – IMC 2009
- D. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems

1.3 SUBMITTALS

- A. Submit drawings and product data grouped to include complete submittals of related products, and accessories in a single submittal.
- B. Testing and Balancing Reports (Pre and Post)

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable Connecticut Building Code.
- B. Conform to applicable Local Building Codes.
- C. Obtain and pay for all applicable permits
- D. Schedule and pay for all inspections necessary for mechanical installation.

1.5 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Owner's Project Representative before proceeding.
- C. Locations of heating, ventilation, and air conditioning equipment and ductwork, as indicated, are approximate only. Exact locations are to be determined by the Contractor during construction. If any location is significantly different from that indicated, the Owner's Project Representative must be notified.

1.6 DRAWINGS AND SPECIFICATIONS

- A. Drawings and specifications are typical of work done and of arrangement desired. Provide all accessories and appurtenances necessary for complete systems.
- B. As-Built Drawings: Maintain a master set of as-built drawings showing the changes and deviations from the contract drawings or the approved shop drawings. Make markups as the changes are made.

END OF SECTION

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SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Basic Electrical Requirements
 - 2. As-Built Documentation
- B. Related Sections
 - 1. Section 01 77 00 - Closeout Procedures

1.2 REFERENCES

- A. ASCE 7-05 – Minimum Design Loads for Buildings and Other Structures
- B. International Building Code – IBC 2009
- C. The Connecticut State Building Code, latest edition
- D. NFPA 70 - National Electrical Code
- E. NFPA 79 – Electrical Standard for Industrial Machinery
- F. ANSI/ISA-S5.4 – Instrument Loop Diagrams

1.3 SUBMITTALS

- A. Submit shop drawings, product data, and reports.
- B. Submit as-built documentation in accordance with Section 01 77 00. I&C documentation shall conform to the latest versions of NFPA 79 and ANSI/ISA-S5.4.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable Connecticut Building Code.
- B. Electrical - Conform to Connecticut Electrical Code. All references to the National Electrical Code or NEC in the project manual shall be construed as references to the Connecticut Electrical Code.
- C. Conform to applicable Local Building Codes.
- D. Obtain and pay for all applicable permits.
- E. Schedule and pay for all inspections necessary for the electrical installation including but not necessarily limited to the general electrical inspection and fire department inspections.

1.5 PROJECT CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission from the Engineer before proceeding.
- C. Location of electrical equipment, devices, and similar items, as indicated, are approximate only. Exact locations are to be determined by the Contractor during construction. If any location is different from those indicated (greater than 5 feet away from location shown on Drawings), the Engineer must give approval to the change.
- D. Verify in field, existing conditions and final locations of equipment installed under other Sections that require electrical work.
- E. Equipment wiring
 - 1. Before pulling any power or control wire or installing conduit, obtain equipment electrical and control installation instructions and wiring diagrams. Any discrepancies from what is shown on the electrical drawings shall be brought to the attention of the Engineer. The Engineer will provide instructions for any changes that may be necessary.
 - 2. Installation of conduit or wire prior to obtaining the above specified information shall be at the Contractor's risk. The Owner will not be responsible for any extra costs related to removal or replacement of conduit or wire resulting from the failure to coordinate equipment conduit and wire requirements. In the event that additional conductors or larger conductors than shown on the Drawings are required, the Owner will not be responsible for any labor costs related to the installation of these materials unless it can be demonstrated by the Contractor to the satisfaction of the Engineer that these conductors could not have been installed at the same time as the conductors shown on the Drawings.
- F. Drawings and Specifications
 - 1. Drawings and Specifications are typical of work done and of arrangement desired. Provide accessories and appurtenances necessary for complete installation (e.g., home runs, conduit and wire for instrumentation and control wiring) that are required to provide a complete electrical system.
- G. As-Built Drawings: Maintain a master set of as-built drawings showing the changes and deviations from the Drawings or the approved shop drawings. Make markups as the changes are made.

1.6 WARRANTY

- A. Submit a written warranty, executed by the Contractor and manufacturer agreeing to the replacement and installation of all material, parts and adjustments required due to failure in materials or workmanship within one year from final acceptance of the Work.
- B. This warranty shall be in addition to, and not a limitation of, other rights and remedies the Owner may have against any party under the Contract Documents. This warranty is in addition to all other warranties existing under either the Contract Documents or required by Law.

1.7 WIRING METHODS

1. Only copper conductors shall be used. Absolutely no aluminum conductors will be allowed.
2. Standoff clamps with a minimum of ¼" space between the standoffs or unistrut with strut clamps shall be used.
3. Boxes, cabinets, panel boards, or other raceways with concentric and/or eccentric knockouts will not be allowed. Field punched knockouts shall be accepted.
4. Do not mount boxes or cabinets directly against the wall, spacers must be used
5. All conduits, plastic or steel, regardless of length or diameter of the conduit, shall be bushed at the ends, except when using insulated hubs/Meyers hubs or FS type boxes. Bushings shall be installed prior to pulling or terminating conductors.
6. All conduits, regardless of their type shall have an Equipment Grounding Conductor (EGC) "BOND" sized per the latest issue of the NEC.

PART 2 PRODUCTS

2.1 GENERAL

- A. Products shall be Underwriter's Laboratory (UL) listed if a UL listing for that product is available.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Perform all work in accordance with Connecticut Electrical Code
- B. Perform all work in accordance with OSHA (Occupational Safety and Health Administration) requirements.
- C. Perform all work in accordance with NFPA 70E, Handbook for Electrical Safety in the Workplace.
- D. Install all equipment in accordance with manufacturer's instructions and recommendations.
- E. Test all electrical components.
- F. Perform all electrical equipment installation, checkout, and test in a safe manner. Provide the following special safety precautions, as appropriate:
 1. Locking and tagging procedures
 2. Barricades
 3. De-energization and/or isolation of equipment prior to testing
 4. Review of procedures with the Engineer and the Owner
 5. Erection of warning signs
 6. Stationing of guards and watchmen
 7. Maintenance of voice communications

8. Personnel orientation
- G. Before energizing any machine or equipment, visually inspect for serviceability. Verify that equipment and machines have been properly lubricated and aligned. Verify nameplate for electrical power requirements.

END OF SECTION

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