PROJECT MANUAL

FOR

BUILDING ENVELOPE REPAIRS AT THE BARNSTABLE COMMUNITY HORACE MANN CHARTER PUBLIC SCHOOL

BARNSTABLE, MASSACHUSETTS

TOWN OF BARNSTABLE

Bidding Documents

August 2, 2017

Prepared by:

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BUILDING ENVELOPE REPAIRS

BARNSTABLE COMMUNITY HORACE MANN CHARTER PUBLIC SCHOOL **# OF PAGES**

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DIVISION 05 METALS

DIVISION 06 WOOD AND PLASTIC

DIVISION 07 THERMAL AND MOISTURE PROTECTION

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SECTION 01 10 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 PROJECT

A. Project Name: Building Envelope Repairs at the Barnstable Community Horace Mann Charter Public School.

B. Project Location

1. 165 Bearses Way

   Hyannis, MA 02601

C. Owner's Name: Town of Barnstable.

D. Architect's Name: CBI Consulting Inc.

1.03 WORK UNDER THIS CONTRACT

A. The work to be done under this contract consists of executing and completing all work required for the Building Envelope Repairs at the Barnstable Community Horace Mann Charter Public School in Hyannis, MA.

B. In general, the Contractor shall supply all material, labor, equipment, insurance, temporary protection, tools and appliances necessary for the proper completion of the Work as described in the Plans and Specifications, in accordance with good construction practice, and as required by the materials manufacturers.

C. Supply all shoring and protection necessary to protect the occupants, building site, building systems, and landscape areas. All means and methods are the responsibility of the Contractor. The Contractor is solely responsible for safety on the job site.

D. All materials shall be new and of the best quality.

E. General Information

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1. If there is a conflict between or within any part of the plans and the specifications, the more stringent requirement shall apply at the sole discretion of the Architect.
2. This document describes (but is not exclusive of) the replacement of all of the roofing, removal and re-installation of selective windows where indicated, installation of flashings, waterproofing and sealants, and replacement of roofing edge metal. The work shall be constructed so as to meet all requirements of the Massachusetts State Building Code, current edition, in addition to all other applicable codes and regulations.
3. The School will be occupied for the duration of the project.

F. The work will include all operations necessary to deliver the building(s) and ancillary on and off-site amenities in a fully installed and operable condition including all utility and site work and obtaining all necessary licenses, permits, and certificates.

G. The following is the scope of work. All work required without limiting the generality thereof includes all labor, materials, equipment, and services required to perform the work fully in the drawings and specifications and includes, but is not limited to, the following:

1. General:
   a. Repair and/or replace all landscape areas, turf areas, walkways and pavements that have been disturbed by the work or Contractor activities to their original condition and to the complete satisfaction of the Owner and Architect.
   b. All Contractor lay-down, storage, dumpsters, etc. shall be limited to the area indicated on the Site Plan. Provide a Site Utilization Plan for approval.
2. Work at Roofs by ROOFING AND FLASHING FILED SUB-BIDDER:
   a. Coordinate sequencing of work with the General Bidder so that adjacent work is provided on a timely basis.
   b. Remove and dispose of all existing roofing at all areas of the building in its entirety and to accommodate roofing systems, including (but not exclusive of) all TPO membrane roof, architectural asphalt shingles, insulation, edge metals, flashing, sealants, gutters and downspouts, and other associated roofing. Refer to Add Alternate #1 description below for additional roof work not included in Base Bid.
   c. Inspect existing wood deck, and replace deteriorated materials to match existing. Refer to Unit Price Schedule for Base Bid quantities.
   d. Install new 80 mil TPO roofing system at all flat and low-slope areas noted on the drawings, complete with membrane, tapered rigid insulation, including all blocking, edge metal, sheet metal flashings, trim and sealants required for a complete watertight installation.
   e. Install Architectural Asphalt Shingles on all sloped roofs, over ice and water membrane at eaves, hips, and valleys
   f. Remove and dispose of existing roof drains where indicated on the Drawings and install new roof drains.
   g. Snake clear all roof drains to the street after completion of all roof work.
   h. Remove and dispose of all existing aluminum gutters and downspouts and install new aluminum gutters and downspouts and in the profiles as indicated on the drawings.

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i. Provide and install concrete splash blocks at all downspouts.

4. Work by WATERPROOFING, DAMPROOFING AND CAULKING FILED SUB-BIDDER:
   a. Coordinate sequencing of work with the General Bidder so that adjacent work is provided on a timely basis.
   b. Install backer rod and sealants at the full perimeter of all aluminum windows that have been replaced.
5. Work by MASONRY FILE SUB-BIDDER:
   a. Coordinate sequencing of work with the General Bidder so that adjacent work is provided on a timely basis.
   b. Remove all existing deteriorated masonry sealer and clean all brick masonry on all exterior elevations of the building, and install breathable clear sealer.
   c. Remove brick masonry and associated flashings and lintels where indicated on the Drawings for infill and replacement with brick and mortar to match existing. Refer to Unit Price Schedule for additional brick replacement and re-pointing quantities.
6. Work by PAINTING FILE SUB-BIDDER:
   a. Coordinate sequencing of work with the General Bidder so that adjacent work is provided on a timely basis.
   b. Base Bid work only: Scrape all existing paint from all existing exterior wood members at the cupola and roof edges (including all fascia, eaves, soffit, rake and other trim), and prepare, prime and paint all exposed surfaces.
   c. Scrape and paint all exterior metal posts and rails where indicated on the Drawings.
   d. Add Alternate #1 work includes the replacement of all wood at the cupola with GFRP, in lieu of painting the existing wood. Painting File Sub-Bidder shall provide a Deduct (credit) for the deletion of all Painting work associated with the work at the Cupola. This price shall be included in Add Alternate #1 price. Refer to Lead Paint Awareness specifications.
   e. Add Alternate #2 work includes the replacement of all wood at the roof edges in with PVC, in lieu of painting the existing wood. Painting File Sub-Bidder shall provide a Deduct (credit) for the deletion of all Painting work associated with the work at the roof edge trim. This credit shall be included in Add Alternate #2 price. Refer to Lead Paint Awareness specifications.
7. Work by GENERAL BIDDER:
   a. Coordinate sequencing of work with all Sub-Bidders so that work is provided on a timely basis.
   b. Provide and install sealants at all aluminum to aluminum joints at the windows that are scheduled for replacement.
   c. Provide and install all structural concrete, structural steel, steel decking, and associated work with the completion of Roofs 'L' and 'Q'. Provide and install metal wall panel soffits and coordinate with work of roofing, metal flashing and trim, and gutters and downspouts by the Roofing and Flashing File Sub-Bidder.
8. **Add Alternate #1**: In lieu of scraping and painting existing wood cupola (by Painting File Sub –Bidder), remove cupola in its entirety to the wood frame and replace all wood with GFRP cupola panels and trim to match existing, and replace

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all copper flashing, louvers, roof and weathervane to match existing. Refer to Lead Paint Awareness specifications.

9. **Add Alternate #2**: In lieu of scraping and painting all existing wood trim at the roof edge fascia, eave, soffit and trim, and wood siding at the gable ends (by Painting File Sub –Bidder), remove all wood fascia, eave, soffit and trim, and siding in its entirety and replace with cellular pvc trim and siding to match existing. Refer to Lead Paint Awareness specifications.

CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in the contract documents portion of the project manual.

B. The project will be bid with the DCAMM Certified 'General Building' Contractor as the GENERAL BIDDER. There will be filed sub-bidders in the categories of 'MASONRY', 'WATERPROOFING, DAMPROOFING AND CAULKING', and 'ROOFING AND FLASHING', AND 'PAINTING'.

1.5 OWNER OCCUPANCY

A. Owner intends to occupy the Project during construction.

B. **The School Department will not allow access to any classrooms at any time during the school year**. The Contractor shall work with the School Department to establish a schedule of operations to accommodate the School Department and allow uninterrupted class schedules. The Contractor shall not work inside Classrooms that are occupied by teachers and students.

C. Cooperate with Owner and Owner's Project Manager to minimize conflict and disturbance, and to facilitate Owner's operations and the School Department's Schedule. Cooperate with any changes in the School Schedule.

D. Schedule the Work to accommodate Owner occupancy and school schedule.

1.6 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas of the Building specifically indicated to receive work. Contractors shall not roam halls or be allowed into areas of the building that are not scheduled for work. Contractors shall not use the roof hatches for access to the roof.

B. Arrange use of site and premises to allow:

1. Owner occupancy.
2. Work by Others.
3. Work by Owner.
   a. Repair work will be ongoing in the building throughout the duration of the project. None of the work is expected to impact the work of this contract.
   b. Cooperate with Owner's staff and separate contractors in all work that is to be performed.
4. Use of site and premises by the public.
5. Use of the building as the Town of Barnstable's Emergency Shelter.

C. Provide access to and from site as required by law and by Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code

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open during construction period; provide temporary exit signs if exit routes are temporarily altered. Provide protected cover over all exterior doors.

2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Existing building spaces may not be used for storage.

E. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days' notice to Owner and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

1.7 EXAMINATION OF SITE AND DOCUMENTS

A. A pre-bid conference will be held at the location, date and at the time indicated in the Invitation to Bid.

B. The bidders are expected to examine and to be thoroughly familiar with all contract documents and with the conditions under which the work is to be carried out. The Owner will not be responsible for errors, omissions, and/or charges for extra work arising from the General Contractors or Subcontractors failure to familiarize themselves with the contract documents, that they are familiar with the conditions and requirements of both where they require, in any part of the work a given result to be produced, that the contract documents are adequate and they will produce the required results.

C. All bidders must inspect the existing site and make their own assessment of the work required to achieve the complete, finished conditions specified in the Contract Documents.

D. Failure to adequately inspect the site and/or correctly assess existing conditions shall not be cause for additional payment.

E. Every contractor will be bound by the scope of work of the Contract Documents and shall make the inspections necessary to assure that the bid price includes the complete scope.

1.8 SUPERVISION OF WORK

A. The Contractor shall be held directly responsible for the correct installation of all work performed under this Contract. The Contractor must make good repair, without expense to the Owner, of any part of the new work, or existing work to remain, which may become inoperative on account of leaving the work unprotected or unsupervised during construction of the system or which may break or give out in any manner by reason of poor workmanship, defective materials or any lack of space to allow for expansion and contraction of the work during the Contractor's warranty period, from the date of final acceptance of the work by the Owner.

B. The Contractor shall furnish a competent Massachusetts licensed superintendent approved by the Owner and Architect. The licensed superintendent shall supervise all work under this contract and who shall remain on duty at the site throughout the Contract period while work is in progress.

1.9 FIELD MEASUREMENTS

A. Although care has been taken to ensure their accuracy, the dimensions shown for

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existing items and structures are not guaranteed. It is the responsibility of the Contractor to verify these dimensions in the field before fabricating any construction component. No claims for extra payment due to incorrect dimensions will be considered by the Owner.

1.10 DAMAGE RESPONSIBILITY

A. The Contractor shall repair, at no cost to the Owner, any damage to building elements, site appurtenances, landscaping, utilities, etc. caused during demolition operation and work of this Contract.

B. The Contractor shall secure the work area and equipment at the end of each workday.

1.11 OWNER FURNISHED PRODUCTS

A. Products indicated “N.I.C.” (Not in Contract), or “E. O.” (Equipment by Owner), or “O.F.O.I.” (Owner Furnished Owner Installed), or other similar acronyms as defined in the contract documents will be furnished and installed by the Owner. Coordination and provision of service lines for such products shall be included under these Construction Contract Documents, if indicated. Final connections from service lines to equipment will be by the Owner, unless otherwise indicated.

1.12 INTENT OF THE PROJECT MANUAL

A. Words in the singular shall also mean and include the plural, wherever the context so indicates, and words in the plural shall mean the singular, wherever the context so indicates.

B. Wherever the terms "shown on drawings" are used in the specifications, they shall mean "noted", "indicated", "scheduled", "detailed", or shall refer to any other diagrammatic or written reference made on the drawings.

C. Wherever the terms "furnish", "install" or "provide" are used in the contract documents, it shall mean to "connect", "apply", "erect", "construct", or similar terms in order to make operative, and to supply all labor and materials, including miscellaneous fittings, hardware, and accessories necessary to complete the installation of the specified item.

D. All the work of the project is "related" in some fashion either by direct contract, sequencing, or coordination. It is the Contractor's responsibility to perform all the work and coordinate all the various trades and types of "related" work in order to meet the schedule and quality standards of the Project.

E. Means and methods of construction as well as compliance with OSHA and all other safety laws and regulations is the exclusive responsibility of the Contractor, his Subcontractors, suppliers, consultants, and servants. The Architect does not have control of the job site.

F. Wherever the term "material" is used in the specifications it will mean any "product", "equipment", "device", "assembly", or "item" required under the Contract, as indicated by trade or brand name, manufacturer's name, standard specifications reference or to other description.

G. The terms "approved" or "approval" shall mean the written approval of the Owner or Architect.

H. The term "specifications" shall mean all information contained in the bound or unbound volume, including all "Contract Documents" defined herein, except for the drawings

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I. The terms "directed", "required", "permitted", "ordered", "designated", "prescribed", and similar words shall mean the direction, requirement, permission, order, designation or prescription of the Owner or Architect; the terms "approved", "acceptable", "satisfactory", and similar words shall mean approved by, acceptable or satisfactory to the Owner or Architect; and the terms "necessary", "responsible", "proper", "correct", and similar words shall mean necessary, reasonable, proper or correct in the judgment of the Owner or Architect.

J. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction or in crawl spaces.

K. "Exposed" means not installed underground or "concealed" as defined above.

L. “Removed” means complete removal of item, and complete disposal in an approved manner.

1.13 ERRORS, OMISSIONS, AND CONFLICTS IN THE PROJECT MANUAL

A. In the case of conflicts in the Drawings and the Specifications noticed by the Contractor, the Architect shall be notified immediately in writing of such errors and/or omissions. In no case shall the Contractor proceed without written authorization from the Architect.

B. If there is a conflict between or within any part of the plans and the specifications, the more stringent requirement shall apply at the sole discretion of the Architect.

1.14 UNFORESEEN FIELD CONDITIONS

A. In the case of unforeseen field conditions, the Contractor shall notify the Owner and Architect immediately in writing of such conditions. In no case shall the Contractor proceed without written authorization from the Architect. If such unforeseen conditions result in additional expense, the Contractor shall not proceed without the written approval of the Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.03 RELATED REQUIREMENTS

A. Section 01 22 00 - Unit Prices: Monetary values of unit prices, payment and modification procedures relating to unit prices.

1.04 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization.

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

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F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.05 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement Submit Pencil Requisition for Owner, OPM and Architect's approval prior to submitting Application for Payment.

B. Forms filled out by hand will not be accepted.

C. For each item, provide a column for listing each of the following:

1. Item Number.
2. Description of work.
3. Scheduled Values.
4. Previous Applications.
5. Work in Place and Stored Materials under this Application.
6. Total Completed and Stored to Date of Application.
7. Percentage of Completion.
8. Balance to Finish.
9. Retainage.

D. Execute certification by signature of authorized officer.

E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

G. Submit six (6) copies of each Application for Payment.

H. Include the following with the application:

1. Transmittal letter as specified for Submittals in Section 01 30 00.
2. Construction progress schedule, revised and current as specified in Section 01 30 00.
3. Certified Payrolls.
4. Partial release of liens from major Subcontractors and vendors.
5. Project record documents as specified in Section 01 78 00, for review by Owner which will be returned to the Contractor.
6. Affidavits attesting to off-site stored products.

I. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.06 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

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C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.

1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
2. Promptly execute the change.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 5 days.

E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 60 00.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
3. For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.
4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

G. Substantiation of Costs: Provide full information required for evaluation.

1. On request, provide the following data:
   a. Quantities of products, labor, and equipment.
   b. Taxes, insurance, and bonds.
   c. Overhead and profit.
   d. Justification for any change in Contract Time.
   e. Credit for deletions from Contract, similarly documented.
2. Support each claim for additional costs with additional information:
   a. Origin and date of claim.
   b. Dates and times work was performed, and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: Architect will issue Change Orders for signatures of

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parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.07 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 UNIT PRICE REQUIREMENTS

A. The Unit Prices for items set forth in the Schedule of Unit Prices shall be used to determine adjustments to the Contract Sum when changes in the Work involving said items are made in accordance with Article 8 of the General Conditions and other sections of the Contract Documents.

B. Unit Prices listed under ADDITIONS have been computed to include net cost plus overhead, profit, and bond and all other charges required to complete the work item.

C. Unit Prices net cost includes the cost of all labor, materials, equipment, disposal, and all other costs required to complete the work item.

D. Materials, methods of installation, and definitions of terms set forth under the various Unit Price items in the Schedule of Unit Prices shall be as indicated in the Contract Documents.

E. Unit costs will <u>not</u> be adjusted if the quantities approved in the field by the Architect vary from the base contract quantities listed in the Project Manual.

1.03 APPLICABILITY OF UNIT PRICES

A. The payment lines shall be determined in the field by the Architect.

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B. Unit Prices are for more work or less work than is included in the base contract for the various tasks included. Quantities to be included in the base contract are listed in the Unit Price Schedule.

C. Prior to commencing removal or placement of materials set forth in the Schedule of Unit Prices, the Contractor shall notify the Architect in sufficient time to permit proper measurements to be taken on behalf of the Owner. Only quantities which have been approved in writing by the Architect will be considered in the determination of adjustments to the Contract Sum. Unit costs shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead, profit, bond and general conditions.

D. Performance of Work which is not required under the Contract Documents or which is not authorized by Change Order, whether or not such Work item is set forth hereunder as a Unit Price item, shall not be considered cause for extra payment. The Contractor will be held fully responsible for such unauthorized work, including the performance of all corrective measures required by the Architect.

E. See attached **Unit Price Schedule**:

#	DESCRIPTION OF WORK	UNIT	BASE BID QUANTITY	REFERENCE DETAILS	ADD / DEDUCT UNIT PRICE (Insert only one number)
1	Remove Deteriorated Wood Roof Deck and Install Wood Roof Deck to match existing.	SF	100		_____ / SF
2	Concrete Deck Spall Repair by Roofing File Sub-Bidder	SF	50		_____ / SF
3	Remove Deteriorated Brick and Replace with Brick to match existing	EA	250 *		_____ / EA
4	Cut Deteriorated Mortar Joints ¾ inch deep and Repoint with Mortar to match existing.	SF	500		_____ / SF
5	Rout and Fill Cracks in Concrete	LF	50		_____ / LF
6	Patch and Paint Spalled Concrete Foundation	SF	50		_____ / SF

*Indicates that the quantity listed is in addition to all the scope areas shown, indicated, or noted on the plans.

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F. All repair locations will be determined and marked in the field by the Architect. Repairs may be located at small individual locations throughout the entire scope area.

G. The Owner reserves that right to increase or decrease the unit cost quantities without any adjustment in the unit prices.

H. Take all measurements and compute quantities. Measurements and quantities will be verified by the Architect.

I. Assist by providing necessary equipment, workers, and survey personnel as required.

J. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

K. Unit costs include pro-rata share of Contractor's, general conditions, staging, insurance, bond, overhead, and profit, etc.

1.04 PAYMENT

A. Unit Price work performed without the approval of the Architect will not be paid for.

B. Payment for work governed by Unit Prices will be made on the basis of the actual measurements and quantities of work that is incorporated in or made necessary by the work and accepted by the Architect, multiplied by the unit price, with no allowance for waste.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

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SECTION 01 23 00

ALTERNATES

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 GENERAL

A. The Add Alternate items as set forth in the Add Alternate Schedule below shall be used to determine adjustments to the Contract Sum if any of these Add Alternates are chosen by the owner to be added to the total Bid Price submitted by the Contractor.

B. The Add Alternate prices as computed are to include net cost plus overhead, profit, bond and all other cost related to the work item.

C. Add Alternate net cost to include the cost of all labor, materials, equipment, disposal, and all other costs that would have been required to complete the work item.

1.03 ADD ALTERNATE SCHEDULE

A. This schedule lists the Add Alternates which are to be incorporated into the Contract Documents. Consult the Specification Sections and Plans for the scope of the work to be included in each Add Alternate.

1. **Add Alternate #1**: In lieu of scraping and painting existing wood cupola, remove cupola in its entirety to the wood frame and replace all wood with GFRP cupola panels and trim to match existing, and replace all copper flashing, louvers, roof and weathervane to match existing. Refer to Lead Paint Awareness specifications.

2. **Add Alternate #2**: In lieu of scraping and painting all existing wood trim at the roof edge fascia, eave, soffit and trim, and wood siding at the gable ends, remove all wood fascia, eave, soffit and trim, and siding in its entirety and replace with cellular pvc trim and siding to match existing. Refer to Lead Paint Awareness specifications.

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PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Preconstruction meeting.

B. Project Coordination

C. Site mobilization meeting.

D. Progress meetings.

E. Construction progress schedule.

F. Daily Reports

G. Progress photographs.

H. Submittals for review, information, and project closeout.

I. Number of copies of submittals.

J. General Notes

K. Insurance

L. Submittal procedures.

1.03 RELATED REQUIREMENTS

A. Section 01 32 16 - Construction Progress Schedule: Form, content, and administration of schedules.

B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

C. Section 01 78 00 - Closeout Submittals: Project record documents.

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1.04 PROJECT COORDINATION

A. Owner's Project Manager (OPM): Mark Marinaccio.

B. Cooperate with the OPM and the School Department's authorized representative in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities and enclosures and protection of building and site areas.

C. During construction, coordinate use of site and facilities through the OPM.

D. Comply with OPM's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the OPM for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Coordination with Building Procedures

1. The safety and welfare of the students, staff, and guests of the BarnstableCommunity Horace Mann Charter Public School are the utmost concern of the project. All work by theContractor, his Sub-Contractors, suppliers, and employees shall be performed in a way that will safeguard this concern. Safety is the sole responsibility of the Contractor on the jobsite. Extraordinary care must be taken throughout the project to coordinate work activities with the School schedules, procedures, and activities.
2. All construction activities and deliveries to the site are to be coordinated with the OPM and the School Department's authorized representative.
3. Pre-construction meeting shall be held with the Owner’s Project Manager, the Contractors, and Architect, to coordinate locations for dumpsters and chutes, deliveries, worker parking, material storage, as well as to discuss safety, scheduling, and procedures.
4. Contractor shall restrict hazardous items and activities to locations that will have the least impact on the daily operations. All material storage, locations of cranes, dumpsters, workers access, etc. will be only in areas approved by the OPM and the School Department's authorized representative.
5. Install, at a minimum, when work is performed overhead, covered walkway protection at all entrance and exit doors, at areas of construction, to the facility during construction activities, 10'-0" minimum length, of pipe scaffolding, plywood, planking, orange plastic fencing, and yellow safety tape. Safety is the sole responsibility of the contractor, regardless of the information in this specification.
6. Contractor shall cover and enclose all interior spaces without a suspended ceiling where roof work will occur above, with minimum 6-mil poly tarps before operations commence on the roof above to protect interior surfaces, furnishings and equipment from debris and dust. The contractor shall move all loose furniture in the classrooms to the center of the room and cover. All protections shall be removed immediately upon completion of the work, and the furniture returned to their original locations.

   Dust and debris not contained by the tarps shall be immediately cleaned and vacuumed to the satisfaction of the OPM and School Department's authorized

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representative. Damage as a result of the work will be repaired to the satisfaction of and at no additional cost to the owner.

7. Contractor shall provide signage and other safety barriers at the site and within the building adequate to support their safety program.
8. The Contractor shall provide, erect and maintain barricades with any required egress, access doors, lighting, ventilation, guard rails and all other appurtenances required to protect the general public, visitors, staff, and workers while construction is in progress. Safety is the sole responsibility of the Contractor on the job site.

1.05 CORI REQUEST FORM

A. All personnel working at the sites will be required to fill out a Barnstable Public Schools CORI request form.

1. All forms shall be submitted to Barnstable Public Schools one week prior to the applicant being on site.
2. The General Contractor will update the list as required to reflect current workers on site.
3. All workers must pass the CORI background check in order to work on this site.

B. The General Bidder, all the File Sub-Bidders, and all the sub-contractors are hereby notified that CORI checks are required for all personnel that will be working on site at any of the Town of Barnstable School properties. It is each individual contractor's responsibility to submit the required paperwork to the State, in advance of the work, so as not to delay the schedule for any possible employee that will access the site. Approval by the state for must be delivered to the Owner in advance of the work. Payments will be withheld to the contractor if he/she fails to submit the proper CORI certifications in advance of the work.

1.06 SCHEDULING

A. Time is of the essence in this project.

a. Temperature is a critical factor in the construction work. Adhere to manufacturer's specifications and installation instructions.

b. <u>The anticipated Start Date of the Work is November 1, 2015. All work shall besubstantially complete by August 20, 2016</u>

c. **The School Department will not allow access to classrooms at any given time during the school year**. The Contractor shall work with the School Department to establish a schedule of operations to accommodate the School Department. The Contractor shall not work inside Classrooms that are occupied by teachers and students.

d. The work must be completed in a continuous uninterrupted operation. The Contractor must use sufficient personnel and adequate equipment to complete all the necessary work requirements within a minimum period of time

e. Unless specifically authorized by the Owner, in writing, the work must be conducted between the hours of 7:00 a.m. and 10:00 p.m. on Monday through Friday. No work is to be done on holidays or Weekends unless approved by the Owner in advance.

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f. The Contractor is responsible for the security and stability of partially completed work until the project is accepted by the Owner.

B. The Contractor shall schedule the work of this Contract so as to perform and complete the Work of the Contract according to the following schedule. The Contractor shall within seven (7) days of the Notice of Contract Award, submit a schedule to the Owner and Architect for review.

C. Between the time period of the general bid due date and Construction Commencement, the Contractor shall take all necessary measures to complete the Work of this Contract. It is expected that the Contractor utilize the time period between the bid date and construction start date to schedule and coordinate the work and work sequence, prepare shop drawings and submittals for approval and order materials. The Owner shall issue a Notice to Proceed. If the work is not complete by the completion date, the Contractor will be subject to liquidated damages.

D. The Contractor shall be responsible for providing any and all measures and/or temporary construction required to control the transmission of dust, particles, and fumes from construction activities.

E. The Contractor shall be responsible on a daily basis for informing the designated Owner's representative of all persons on-site that day associated with the Work. The Contractor shall establish a daily reporting system of all activities which is acceptable to the Owner.

F. The Construction schedule shall indicate the dates for start and completion of each work item or task required with all milestones using a Bar Chart subject to approval by the Architect.

G. Contractor shall update the Construction schedule weekly. Requisitions for payment must be accompanied by an updated schedule. The on-site superintendent shall meet with the Owner's Authorized Representative daily to inform them of the dailyprogress and review the schedule for the next three (3) days.

H. The Awarding Authority's review of the project construction schedule shall not extend to the accuracy or other matters dealt with in the schedule, including but not limited to whether work is omitted, whether duration of activity is reasonable, the level of labor, materials or equipment, the Contractor's means, methods, techniques, procedures or sequence of construction, or whether the sequence and timing for work remaining are practical. The accuracy, correctness of all work, sequencing, and schedules shall remain the sole responsibility of the Contractor. Neither the Awarding Authority's review of a schedule nor a statement of resubmittal not required shall relieve the Contractor for the responsibility for complying with the contract schedule, adhering to sequences of work, or from completing any omitted work with the Contract Time.

1.06 COORDINATION

A. The Contractor shall submit for approval to the Owner and OPM a detailed operational plan showing the sequence of operations prior to commencement of any work at the site. Any changes to this operational plan must be approved by the Owner and OPM.

B. The Contractor must retain on the Work during its progress a competent full-time non-working licensed construction superintendent, satisfactory to the Owner. This representative shall not be changed, except with the consent of the Owner. The representative shall be in full charge of the work and all instructions given to this person by the Architect shall be binding.

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C. The Owner shall assist the Contractor to perform the Work in accordance with the approved operational plan.

D. The Contractor shall provide:

1. Notification to the Owner two (2) weeks before any work is scheduled at the site/building.
2. Notification to the Owner in writing forty-eight (48) hours before work is scheduled in any particular area.
3. An updated schedule monthly with the application for payment. Payments will not be authorized until the updated schedule is received and approved.
4. The Contractor must supply to the Owner the cell phone number of a responsible person who may be contacted during non-work-hours for emergencies on the Project.

1.07 SUBCONTRACTORS

A. Subcontractors are subject to approval by the Owner.

1.08 CONSTRUCTION REVIEW

A. All materials and workmanship shall be subject to review by the Architect and all designated representatives of the Owner. Such review may take place at any time during the construction, and wherever work relating to this project is underway. The Contractor shall notify the Architect of any approaching stage of the work likely torequire his/her attention, and the Architect shall have the right to reject all defectiveor non-conforming workmanship and material, and to require its replacement.

a. If any un-reviewed work is covered up without approval, the Contractor shall bear the costs of uncovering it upon request.

1.09 CODES

A. Codes, standards, and publications of private and public bodies mentioned in these specifications, and other such standards and specifications, refer to the latest edition thereof at the time of taking bids unless a specific edition is designated, and shall be considered and integral part of the Contract Documents.

1.10 COORDINATION OF WORK

A. Contractor shall coordinate all construction work with the Owner's Project Manager.

B. Contractor is responsible for all building and sidewalk permits, police details as required as well as any other requirements that may be imposed by the Town.

C. After the demolition and removal of the existing roofing, the Contractor shall be responsible for the protection and security of the roof decks and interior spacesbelow prior to the installation of the new roofing (same day).

1.11 FIELD MEASUREMENTS

A. Before ordering any materials or performing any work, the Contractor or his/her subcontractors shall inspect all existing conditions and perform all measurements atthe building. No extra charge or compensation will be allowed because of differences between the drawings and the actual dimensions. Any differencesbetween the Project Manual and the actual conditions found shall be submitted to the Architect for direction before proceeding with the work.

1.12 CUTTING AND PATCHING

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A. The work to be performed under this Contract shall include all cutting and patching necessary to accommodate new work.

B. Each Filed Sub-Bidder shall be responsible for temporary removal, and removal and disposal of existing materials to accommodate their work, unless noted otherwise.

1.13 PERMITS

A. Procurement of building permits shall be the responsibility of the Contractor. Requests for inspections by the Building Inspector and the obtaining of required signatures by Inspection on permits is the responsibility of the Contractor. **Permit fees will NOT be waived**.

1.14 HOUSEKEEPING AND PROTECTION OF EXISTING CONDITIONS

A. Protections

1. Maintain the premises in a safe, orderly condition at all times. Protect construction, furnishings, equipment and other items.
2. Property Protection: The General Contractor shall take all measures necessary to protect the Owner's property.
3. Security: The General Contractor shall take every possible precaution to maintain the security of the buildings and site. The Contractor shall cooperate with the Owner fully and follow the Owner's directions as issued. The Contractor shall control and restrict access to areas of work to prevent injury to persons and property.
4. The Contractor shall properly cover, protect and maintain floor and finished surfaces to prevent damage. Replace protective coverings which become wet, torn or ineffective.
5. Roof and Finished Surfaces Protection:
   a. The Contractor shall restrict traffic on roofs and finished surfaces to that required to perform the work of this Contract and permit traffic only required to properly complete the Work.
   b. Effectively protect surfaces to prevent damages to existing substrates, new finishes, and to finished roofing work. Provide temporary walkways and work platforms as needed.
   c. Load distribution: The Contractor and any Subcontractor shall not load or permit any part of the structure to be loaded in any manner that will damage the existing structure or endanger the safety of persons or property. Such loads shall include live and dead loads and all moving, vibratory, temporary and impact loads.
6. Correction by the Contractor
   a. At no additional cost to the Owner, the General Contractor shall immediately correct all deficiencies, including damages to the building, site and site surfaces, damages to furnishings, damages to equipment or systems, damage to adjacent properties, and all other damage caused by the General Contractor or its Subcontractors during the execution of the Work of this Contract. Any and all damages resulting from inadequate, insufficient or defective temporary protections installed by the Contractor during the work of this Contract, shall be corrected by the General Contractor at no additional cost to the Owner

B. Requirements Related to Building Users' Furnishings, Equipment and Other Items

1. The General Contractor is responsible for protecting all furnishings, equipment and

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items from damage (including construction generated dust) during the entire construction period.

2. The General Contractor shall be responsible for moving and re-setting up all furniture, fixed and movable equipment, file and storage cabinets, recreation equipment, boxes, and all other items to accomplish the work of both the General Contractor and the Subcontractors in its entirety.

C. Dust, Dirt, and Fume Control

1. The Contractor shall take all necessary precautions and provide all necessary temporary construction to effectively contain dust, dirt and fumes within the areas of work and within the work limits. Temporary construction shall be provided to effectively prevent dust and dirt from entering areas of the buildings or adjacent buildings, satisfying all City, State and Federal laws, codes, and requirements.

D. Rubbish Removal

1. The Contractor shall remove all rubbish, waste, tools, equipment and appurtenances caused by and used in the execution of the Work; but this shall in no way be construed to relieve the Contractor of his primary responsibility for maintaining the building and Project site clean and free of debris, leaving all work in a clean condition and satisfactory to the Official.
2. Immediately after unpacking, the Contractor shall collect and remove from the building and Project site all packing materials, case lumber, excelsior, wrapping and other rubbish.
3. Rubbish removal shall occur so that trash and debris are contained in closed and secured waste containers.

E. Dumping

1. The contractor shall submit an affidavit certifying legal and proper dumping and disposal (including locations) of all materials from the project.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Owner will schedule a meeting after Notice of Award.

B. Attendance Required:

1. Owner.
2. Owner's Project Manager.
3. Architect.
4. Contractor.

C. Agenda:

1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.

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4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures
6. Designation of personnel representing the parties to Contract, Owner and Architect.
7. Review of Commissioning - related requirements, testing and procedures.
8. Distribution of Contact Information
9. Site Utilization Plan, for Owner approval, including review of all dumpster, lay-down/ storage areas, trailers and staging area locations.
10. Temporary Power and Water.
11. Inclement Weather.
12. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
13. Scheduling.

3.02 SITE MOBILIZATION MEETING

A. Owner will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:

1. Contractor.
2. Owner.
3. Architect.
4. Contractor's Superintendent.
5. Major Subcontractors.

C. Agenda:

1. Use of premises by Owner and Contractor.
2. Owner's requirements and occupancy prior to completion.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by Owner.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

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3.03 PROGRESS MEETINGS

A. Architect will make arrangements for regular job meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Owner's Project Manager, Architect, as appropriate to agenda topics for each meeting.

C. Agenda:

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

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 5 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 5 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.05 PROGRESS PHOTOGRAPHS

A. Take photographs as evidence of existing project conditions.

3.06 DAILY PROGRESS REPORTS

A. Provide a copy of the daily superintendent report to the Owner's project manager's clerk daily.

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3.07 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:

1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Provide submittals as indicated in Section 01 30 00; 3.10.

C. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

D. Samples will be reviewed only for aesthetic, color, or finish selection.

E. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

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

3.08 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:

1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout:

1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

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3.10 PRE-CONSTRUCTION PHOTOS

A. Contractor shall submit pre-construction photos on one CD that documents all pre-existing building and site conditions. All damages observed after construction shall be deemed the responsibility of the Contractor unless otherwise documented.

B. Submit for Owner's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review. Provide electronically, digital copies of all submittals in addition to hard copies required:

1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus one copy to be retained at the project site, plus two copies to be retained by the Owner, and two copies that will be retained by Architect.
2. Larger Sheets, Not Larger Than 36 x 48 inches: Submit the number of opaque reproductions that Contractor requires, plus one copy to be retained at the project site, plus two copies to be retained by the Owner, and two copies that will be retained by Architect.

B. Documents for Information: Submit two copies.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.

1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. Transmit each submittal with a copy of approved submittal form.

B. Transmit each submittal with approved form.

C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

E. Schedule submittals to expedite the Project, and coordinate submission of related items.

F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

H. Provide space for Contractor and Architect review stamps.

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

3.13 GENERAL NOTES

A. CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND COORDINATING ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. IN CASE OF CONFLICT, THE ARCHITECT SHALL BE NOTIFIED AND SHALL RESOLVE THE CONFLICT.

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B. IN ANY CASE OF CONFLICT BETWEEN THE DRAWINGS AND THE PROJECT SPECIFICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

C. THE CONTRACTOR SHALL MAKE NO DEVIATION FROM DESIGN DRAWINGS WITHOUT PRIOR REVIEW BY THE ARCHITECT.

D. WORK NOT INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES SHALL BE REPEATED.

E. ALL WORK SHALL COMPLY WITH APPLICABLE CODES AND LOCAL LAWS AND REGULATIONS.

F. GENERAL CONTRACTOR SHALL COORDINATE LOCATIONS OF OPENINGS, PITS, BOXES, SUMPS, TRENCHES, SLEEVES, DEPRESSIONS, GROOVES, AND CHAMFERS, WITH MECHANICAL, ELECTRICAL AND PLUMBING TRADES.

G. THE STRUCTURAL DESIGN OF THE BUILDING IS BASED ON THE FULL INTERACTION OF ALL ITS COMPONENT PARTS. NO PROVISIONS HAVE BEEN MADE FOR CONDITIONS OCCURRING DURING CONSTRUCTION. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO MAKE PROPER AND ADEQUATE PROVISIONS FOR STABILITY OF, AND ALL STRESSES TO THE STRUCTURE DUE TO ANY CAUSE DURING CONSTRUCTION.

H. CONTRACTOR SHALL NOT SCALE DRAWINGS. CONTRACTOR SHALL REQUEST ALL DIMENSIONS OR INFORMATION REQUIRED TO PERFORM THE WORK FROM THE ARCHITECT. WORK COMPLETED BY THE CONTRACTOR WITHOUT DIMENSIONS OR INFORMATION SHALL BE DONE AT THEIR OWN RISK AND, IF DEEMED INCORRECT BY THE ARCHITECT, SHALL BE REMOVED AND REINSTALLED TO THE SPECIFICATIONS OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.

I. CODES: THE PROJECT IS BASED ON THE REQUIREMENTS OF THE MASSACHUSETTS STATE BUILDING CODE - EIGHTH EDITION.

J. THE PLANS WERE COMPILED FROM VARIOUS SOURCES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS AND DIMENSIONS.

3.15 INSURANCE

A. The Contractor shall purchase and maintain, at his expense all insurance required by the Contract. Documents and all insurance required by the applicable laws of Massachusetts, including but not limited to, General Laws, Chapter 146, in connection with all hoisting equipment.

B. The Contractor shall purchase and maintain such insurance as will protect him from claims under workmen's compensation acts and from claims for damages because of bodily injury, including death and all property damage including, without limitation, damage to buildings and adjoining the site of construction which might arise from and during operations under this contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them including:

1. Statutory Worker's Compensation and Employer's Liability

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The contractor shall provide insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws (so-called Worker's Compensation Act) to all persons to be employed under this contract and shall continue in force such insurance as aforesaid shall be deemed a material breach of this Contract and shall operate as an immediate termination thereof. The contractor shall, without limiting the generality of the foregoing, conform to the provisions of Section 34A of Chapter 149 of the General Laws, which Section is incorporated herein by reference and made a part of hereof.

2. Comprehensive General Liability Insurance

   Minimum bodily injury limits of $ 500,000 per person and $ 1,000,000 per accident, and property damage limits of $ 500,000 per accident and $ 1,000,000 aggregate during any 12 month period, shall include the following:

   a. Public liability (bodily injury and property damage)

   b. X.C.U. (explosion, collapse, and underground utilities)

   c. Independent contractor's protective liability.

   d. Products and completed operations.

   e. Save harmless agreement for Owner and Architects set forth in ARTICLE 10.11 of the GENERAL CONDITIONS.

3. Comprehensive All Risk Motor Vehicle Liability Insurance

   Minimum bodily injury limits of $ 500,000 per person, $ 1,000,000 per accident, and property damage limit of $ 1,000,000 per accident.

4. All Risk Insurance

   Covering all Contractor's equipment with a provision for Waiver of Subrogation against the Owner.

5. Excess Liability Insurance in Umbrella Form with combined Bodily Injury and Property Damage Limit of $ 1,000,000.

6. Town of Barnstable and CBI Consulting Inc. shall be listed as Additional Insured with a Waiver of Subrogation on the insurance policy for this project.

END OF SECTION

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SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.03 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within five (5) days after review of preliminary schedule, submit draft of proposed complete schedule for review.

D. Within five (5) days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit the number of opaque reproductions that Contractor requires, plus one copy for the Owner's Project Manager and one copy that will be retained by Architect.

1.04 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches or width required.

C. Scale and Spacing: To allow for notations and revisions.

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PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules for each stage of Work identified in Section 01 10 00.

E. Provide sub-schedules to define critical portions of the entire schedule.

F. Include conferences and meetings in schedule.

G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, Products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.

I. Coordinate content with schedule of values specified in Section 01 20 00 - Price and Payment Procedures.

J. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 NETWORK ANALYSIS

A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.

B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.

C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:

1. Preceding and following event numbers.
2. Activity description.
3. Estimated duration of activity, in maximum 15 day intervals.
4. Earliest start date.
5. Earliest finish date.

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6. Actual start date.
7. Actual finish date.
8. Latest start date.
9. Latest finish date.
10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
11. Monetary value of activity, keyed to Schedule of Values.
12. Percentage of activity completed.
13. Responsibility.

D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and re-computation of all dates and float.

E. Required Reports: List activities in sorts or groups:
1. By preceding work item or event number from lowest to highest.
2. By amount of float, then in order of early start.

3.05 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 5 days.

3.06 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

3.07 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

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SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Mock-ups.

B. Control of installation.

C. Tolerances.

D. Testing and inspection services.

E. Manufacturers' field services.

1.03 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures.

B. Section 01 42 16 - Definitions.

C. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.04 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).

B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2014.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2013.

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D. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2014a.

E. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2013.

F. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

1.05 SUBMITTALS

A. Testing Agency Qualifications:

1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time specialist and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.

1. Include:
   a. Date issued.
   b. Project title and number.
   c. Name of inspector.
   d. Date and time of sampling or inspection.
   e. Identification of product and specifications section.
   f. Location in the Project.
   g. Type of test/inspection.
   h. Date of test/inspection.
   i. Results of test/inspection.
   j. Conformance with Contract Documents.
   k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.

1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

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E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.

1. Submit report in duplicate within 10 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.06 PULL-OUT TESTS

A. The Contractor shall perform pull-out tests to determine the length and type of fastener required to provide adequate withdrawal resistance from every substrate.

B. A minimum of two (2) pull out tests shall be performed per section to be fastened. More tests shall be performed if required by the Architect or OPM or the material manufacturer.

C. Submit a report from the fastener supplier and the product manufacturer describing the pull out tests, the recommended fasteners, and that they are covered under the manufacturer's warranty.

1.07 TESTING AND INSPECTION AGENCIES

A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:

1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, and ASTM C1093.
2. Laboratory: Authorized to operate in the State in which the Project is located.
3. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
4. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program

D. The Contractor shall cooperate with the inspector and/or testing laboratory, furnish materials and labor as may be required and provide for convenient access to all parts of the Work for purposes of inspection and testing.

E. The Contractor shall accept as final the results of all such inspection and testing.

F. The inspector and/or testing laboratory reserves the right to require the Contractor to perform removal of materials installed by the Contractor. Make all cuts in accordance with the recognized standard practices. Remove materials only in the presence of the inspector.

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1. Immediately after removing each material sample identify each by number and exact location by gummed label attached to a smooth surface of the cut sample.
2. Submit the cut samples directly to the inspector after applying identification.
3. Replace the cut with new materials, matching those removed, immediately after each removal, and insure that the replacement is completely watertight.

G. The removal cuts shall be subjected to various tests, including moisture content, density, thickness, compressive strength, composition, conformance with ASTM specifications where applicable, conformance with the recommendations of the manufacturers whose materials were used.

H. Bear all costs for tests where materials or systems have been found unacceptable and all costs for replacement required due to such unacceptability.

I. If any replacement Work is required, such Work will also be subject to the terms of this Specification.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

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

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

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

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

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

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

3.02 MOCK-UPS

A. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work, and will be required for each typical installation detail / condition by the General Bidder and each Filed Sub-Bidder.

B. Integrated Exterior Mockups: construct integrated exterior mockup. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mockup materials as necessary.

C. Provide supervisory personnel who will oversee mockup construction. Provide workers that will be employed during the construction at Project.

D. Tests shall be performed under provisions identified in this section and identified in the

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respective product specification sections.

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

F. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

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

H. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

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

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

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

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:

1. Test samples of mixes submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
6. Perform additional tests and inspections required by Architect.
7. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to

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manufacturers' facilities.

3. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 10 days in advance of required observations.
   1. Observer subject to approval of Architect.
   2. Observer subject to approval of Owner.

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

3.06 DEFECT ASSESSMENT

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

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

END OF SECTION

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SECTION 01 42 16

DEFINITIONS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SUMMARY

A. This section supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

1.03 DEFINITIONS

A. "Consultant": Any reference to "Designer", "Engineer" or "Architect" in this Project Manual, Specification or on the drawings shall refer to CBI Consulting Inc., 250 Dorchester Avenue., Boston, Massachusetts 02127, (617) 268-8977, Steven Watchorn, Project Manager.

B. Furnish: To supply, deliver, unload, and inspect for damage. See also 01 10 00 Intent of the Project Manual.

C. "Owner": Any reference to the Owner shall be the Town of Barnstable.

D. "Owner's Project Manager": Any reference to Owner's Project Manager (OPM) in this Project Manual, Specification, or on the drawings shall refer to Mark Marinaccio, Project Architect for the Town of Barnstable Structures & Grounds.

E. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use. See also 01 10 00; 1.11 Intent of the Project Manual.

F. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

G. Project Manual: The book-sized volume that includes the procurement requirements, the contracting requirements, and the specifications.

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H. Provide: To furnish and install. See also 01 10 00; 1.11 Intent of the Project Manual.

I. Supply: Same as Furnish. See also 01 10 00; 1.11 Intent of the Project Manual.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Temporary utilities.

B. Temporary telecommunications services.

C. Temporary sanitary facilities.

D. Temporary Controls: Barriers, enclosures, and fencing.

E. Security requirements.

F. Vehicular access and parking.

G. Waste removal facilities and services.

H. Field offices.

1.03 GENERAL

A. The Contractor shall be responsible for providing and maintaining all temporary facilities until Substantial Completion. Removal of such prior to Substantial Completion must be with the concurrence of the Architect. The Contractor bears full responsibility for re-providing any facility removed prior to Substantial Completion.

B. Removal of all temporary facilities shall be a condition precedent to Substantial Completion unless directed otherwise by the Architect or specifically noted in the Specifications.

C. The Contractor must comply with all safety laws and regulations of the Commonwealth of Massachusetts, the United States Government, and local government agencies applicable to Work under this Contract. The Contractor's attention is directed to the Commonwealth of Massachusetts, Department of Labor and Industries Regulation 454

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CMR.

D. Safety is the sole responsibility of the Contractor on the job site. Contractor is notified that the building will be occupied during construction. The Architect does not have control of the job site in any way.

1.04 TEMPORARY UTILITIES

A. Owner will provide the following:

1. Electrical power, consisting of connection to existing facilities, except for temporary heat.
2. Water supply, consisting of connection to existing facilities.
3. It is the responsibility of the Contractor to make provisions to extend the utility from the nearest service outlet designated by the Owner to the point of use.

B. If the Owner finds that the Contractor has been using excess quantities of water and electricity, the Owner will require the contractor to pay for all electrical power and water required for construction purposes, and to provide and pay for sub-meters to monitor the usage.

C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

D. The Contractor shall provide extensions, including (but not exclusive of) piping, hoses, and extension cords to existing utilities as required to perform the Work.

E. The Contractor shall provide an adequate supply of cool drinking water with individual drinking cups for personnel on the job.

1.05 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:

1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
2. The Contractor shall provide a separate cell phone for the use of the Contractor's Project Superintendent.
3. The Contractor shall pay for the installation and removal of the foregoing temporary cell phone and for all calls and charges in connection therewith.
4. No telephone service will be provided by the Owner.
5. All telephone numbers for the project team shall be available to the project team. Provide cell phone for the Project Superintendent at the job site.
6. Provide 24-hour emergency phone numbers for the Contractor’s Project Manager and Superintendent.
7. Internet Connections: Minimum of one; Cable modem or faster. Internet may be connected to Owner's existing system if sufficient capacity exists. If not, the Contractor shall provide and pay for additional service.
8. Email: Account/address reserved for project use.

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1.06 TEMPORARY SANITARY FACILITIES

A. Portable toilets shall be provided by the Contractor.

B. Use of the building's facilities by the Contractor shall not be permitted.

C. Protect the facilities from damage or vandalism.

D. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

E. Maintain Portable Toilets daily in clean and sanitary condition until Substantial Completion. Portable Toilets shall be emptied twice per week, minimum, and more often if required by the Owner. At Substantial Completion, professionally clean the site and return them to their original condition.

1.07 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition. This includes removing and storing all ladders and staging from the site overnight to prevent access to the roof.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building. Such protective measures shall also be located and constructed as required by other local, state, and federal ordinances, laws, codes, or regulations.

C. Provide protection for plants and grass area. Replace damaged landscaping.

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

1.08 FENCING

A. Provide minimum 6 foot high security fence around all storage areas, equipment storage areas, staging, and any areas providing access to above grade work areas. Equip all areas providing access to the fenced areas with vehicular and pedestrian lockable gates. Provide Construction site signage, as well.

B. Site safety is the sole responsibility of the Contractor on the job site.

1.09 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.10 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from all Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Wood Framing and sheathing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

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1.11 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

C. Secure all tools and equipment at all times. Do not leave any tools or equipment in any areas where students can or will have access.

D. Security of the job site is the sole responsibility of the contractor.

1.12 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Designated existing on-site roads may be used for construction traffic.

F. Existing parking areas in locations indicated on the Site Plan, may be used for construction parking, subject to coordination with the Owner, and approval of the Site Utilization Plan.

G. Designate one parking space for Owner and Architect use.

1.13 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

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

1.14 FIELD OFFICES

A. Provide Construction Office Trailer: Weather tight, with lighting, electrical outlets, heating, cooling equipment.

B. The Contractor shall provide a suitable Project Trailer at this location, 400 SF minimum, that shall be accessible at all times to the Owner’s Representative, the Architect, and their authorized representatives. Locate offices a minimum distance of 30 feet from existing and new structures.

C. The Owner will not provide any space within the buildings for use by the Contractor as an office. There is space on the property for contractor supplied site office trailers and storage units. Locations as directed by the Owner.

D. Weekly job meetings shall be held at the job site.

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E. The following furniture and equipment shall be provided in good condition. The furniture and equipment shall remain the property of the Contractor after Substantial completion of the Work.

1. One workstation desk and chair.
2. One coat rack and 12 wall coat hooks.
3. One plan rack and shelves for samples.
4. One 4-drawer metal file cabinet with lock and key.
5. One accurate outside mercury thermometer.
6. Two wall calendars.
7. One Conference table, 4' x 10', with seating for six (6).
8. One facsimile machine / wireless printer with copying capability and a dedicated phone line for the FAX machine.
9. One 12.1 megapixel digital camera with software and 8GB memory card. Contractor shall supply all batteries needed.
10. Two 4’ x 8’ white marker boards, with two (2) boxes of assorted dry erase markers.
11. One laptop computer for the exclusive use of the Owner’s Representative with the following specs:

PROCESSOR	Intel® Core™ i5-2430M processor (2.40GHz, 3M cache,with Turbo BoostTechnology 2.0))
OPERATING SYSTEM	Genuine Windows® 7 Professional,w XP Mode, No Media, 64-bit, English
PRODUCTIVITY SOFTWARE	Microsoft™ Office® Basic 2007
WARRANTY & SERVICE	1 Year Basic Limited Warranty and 1 Year NBD On-Site Service
LCD PANEL	15.6" HD (1366x768) Anti-Glare LED-backlit
MEMORY	8.0GB, DDR3-1333MHz SDRAM, 2 DIMMS
OPTICAL DRIVE	8X DVD+/-RW with double-layer DVD+/-R write capability, with Roxio Creator
VIDEO CARD	Intel® HD Graphics 3000
HARD DRIVE	320GB 7200RPM SATA Hard Drive
WI-FI WIRELESS CARD	Dell Wireless™ 1530 802.11a/g/n Draft Mini Card
WEBCAM	Light Sensitive Webcam and Noise Cancelling Digital Array Mic
BATTERIES	6-cell Lithium Ion Primary Battery
TOP SELLING SOFTWARE	Trend Micro Titanium Internet Security, 15 Month
DELL PRINTER	Dell 1135n Multifunction Laser Printer
SERVICE & SUPPORT	1 Year Basic Limited Warranty and 1 Year Advanced Exchange

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DELL V305 ALL IN ONE PRINTER	Dell 1135n Laser Printer
ADOBE SOFTWARE	Adobe® Reader
SECURITY	Trend Micro Titanium Internet Security, 15 Month
ON-SITE SYSTEM SET-UP	Onsite System Setup
DELL DATASAFE™ ONLINE BACKUP	Online Data Back Up
SOUND OPTION	High Definition Audio 2.0
Customized Pictaflex LCD Back	No Customization LCD Option
Processor Branding	Intel Core i5 Duo Label

E. The offices, equipment, and furnishings shall be maintained by the **Contractor** in a clean and orderly condition, and be removed upon receipt of written direction of the **Owner's Representative**.

F. Provide wireless internet service in the office.

1.15 TEMPORARY STAGING, STAIRS, CHUTES

A. Except as otherwise specified, the Contractor shall furnish, install, maintain in safe condition, and remove all scaffolds, staging, and planking over 8 ft. in height, required for the use of all trades for proper execution of the Work, except as noted.

B. The Contractor shall furnish, install, maintain in safe condition, and remove all temporary ramps, stairs, ladders, and similar items as required for the use of all trades for the proper execution of the Work.

C. The Contractor shall furnish, install, maintain, and remove covered chutes from the work area. Such shall be in convenient locations and permit disposal of rubbish directly into trucks or disposal units.

D. Debris shall not be allowed to fall freely from upper levels of the building. Materials shall not be thrown or dropped from open windows or the roof.

E. The General Bidder is responsible for erecting and maintaining, in safe condition, all scaffolding or staging required on the job, as well as all hoisting, to perform all the work in their scope, for the use of all Sub-Contractors, and for use by the Architect who will need to review the work or mark or verify quantities on the project. Any scaffolding shall include a protective screen securely attached to the scaffold for the entire height of the scaffold.

F. Provide any and all additional protection required to keep the building from being damaged by the staging, hoisting, or any construction work. Protect parapets and roof edges with plywood at all swing staging. Protect landscaping from mechanical lifts, scaffolding, and all construction activities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.03 SUBMITTALS

A. Refer to Section 01 30 00 for additional requirements.

B. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

1. Submit within 15 days after date of Agreement.
2. For products specified only by reference standards, list applicable reference standards.

C. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project. The General Contractor shall include an electronic copy with all submittals.

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D. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

D. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. DO NOT USE products having any of the following characteristics:

1. Made of wood from newly cut old growth timber.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

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

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

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

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

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B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Substitution Submittal Procedure:

1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

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

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

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

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

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to

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minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

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

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

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

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

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

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

K. Prevent contact with material that may cause corrosion, discoloration, or staining.

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

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

END OF SECTION

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SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Pre-installation meetings.

D. Cutting and patching.

E. Cleaning and protection.

F. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

G. General requirements for maintenance service.

1.03 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary of Work: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01 30 00 - Administrative Requirements: Submittals procedures, Electronic document submittal service.

C. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.

D. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.

E. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.

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F. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

G. Section 02 41 00 - Selective Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.04 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.

1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
2. Identify demolition firm and submit qualifications.
3. Include a summary of safety procedures.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.
2. Integrity of weather exposed or moisture resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate Contractor.
6. Include in request:
   a. Identification of Project.
   b. Location and description of affected work.
   c. Necessity for cutting or alteration.
   d. Description of proposed work and products to be used.
   e. Alternatives to cutting and patching.
   f. Effect on work of Owner or separate Contractor.
   g. Written permission of affected separate Contractor.
   h. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.06 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.
   1. Minimum of 5 years of documented experience.

B. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

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1.07 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.

2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.

E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

1. Pest Control Service: Weekly treatments.

F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.08 COORDINATION

A. See Section 01 10 00 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

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

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After Owner occupancy of premises, coordinate access to site for correction of defective

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work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

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

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

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

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:

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1. Review conditions of examination, preparation and installation procedures.
2. Review coordination with related work.

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

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.

1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
2. Remove items indicated on drawings.
3. Relocate items indicated on drawings.
4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
5. Where new surface finishes are not specified or indicated, patch holes and damaged

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surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
   b. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
2. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:

1. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of

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off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:

1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

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

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

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

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

E. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on the site.

2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

3. Do not dispose of wastes into streams or waterways.

F. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

G. Do not allow materials and rubbish to drop free or be thrown from upper floors, but remove by use of a material hoist or rubbish chutes.

H. Maintain the Site free from accumulations of waste, debris, and rubbish.

I. Provide on-site containers for collection of waste materials and rubbish.

J. At the end of each day, remove and legally dispose waste materials and rubbish from site.

K. Disposal of materials shall be in compliance with all applicable laws, ordinances, codes, and by-laws.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

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

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

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

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Prohibit traffic from landscaped areas.

H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.09 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.10 FINAL CLEANING

A. Prior to submitting a request to the Architect to certify Substantial Completion of the Work, the Contractor shall inspect all interior and exterior spaces and verify that all waste materials, rubbish, tools, equipment, machinery, and surplus materials have been removed, and that all

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sight-exposed surfaces are clean. Leave the Project clean and ready for occupancy.

B. Unless otherwise specified under other sections of the Specifications, the Contractor shall perform final cleaning operations as herein specified prior to final inspection.

C. Cleaning shall include all surfaces, interior and exterior, which the Contractor has had access to, whether new or existing.

D. Employ experienced workmen or professional cleaners for final cleaning.

E. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.

F. Use cleaning materials which will not create a hazard to health or property and which will not damage surfaces.

G. All broken or defective glass caused by the Contractor's Work shall be replaced at the expense of the Contractor.

H. Remove grease, mastic, adhesive, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces. This includes cleaning of the Work of all finishing trades where needed, whether or not cleaning by such trades is included in their respective specifications.

I. Clean and polish all new and existing glass and plastic glazing (if any) throughout the building(s), on both sides. Clean plastic glazing in accordance with the manufacturer's directions. This cleaning shall be completed by qualified window cleaners at the expense of the Contractor just prior to acceptance of the Work.

J. Wash and polish all mirrors.

K. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces.

L. Polish glossy surfaces to a clear shine.

M. Do the final cleaning of resilient floors and wood floors as specified under the respective sections of the Specifications.

N. Leave all architectural metals, hardware, and fixtures in undamaged, polished conditions.

O. Leave pipe and duct spaces, plenums, furred spaces and the like clean of debris and decayable materials.

P. In cleaning items with manufacturer's finish or items previously finished by a Subcontractor, care shall be taken not to damage such manufacturer's or Subcontractor's finish. In cleaning glass and finish surfaces, care shall be taken not to use detergents or other cleaning agents which may stain adjoining finish surfaces. Any damage to finishes caused by cleaning operations shall be repaired at the Contractor's expense.

Q. Broom clean exposed concrete surfaces and paved surfaces. Rake clean other surfaces of grounds.

R. Ventilating systems - Replace filters and clean ducts, blowers, and coils if units were operated during construction.

S. Owner's responsibility for cleaning commences at Substantial Completion.

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3.11 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide copies to Architect and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Owner will occupy all of the building as specified in Section 01 10 00.

F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

H. Accompany Project Coordinator on Contractor's preliminary final inspection.

I. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

J. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.12 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

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

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

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SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.03 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.04 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment. All submittals shall also be submitted in digital format.

B. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
3. Submit one copy of completed documents 15 days prior to final inspection. This

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copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.

4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

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

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

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Contractor shall maintain and record all changes to the plans throughout the entire project and shall submit as-built drawings of the entire project, in electronic AutoCAD and PDF format, prior to final payment. The Town and the Architect will provide existing AutoCAD base files for the sole purpose of the Contractor to generate the as-built drawings. Legibly mark each item to record actual construction including:

1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
2. Field changes of dimension and detail.

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3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.

2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.

2. Identify function, normal operating characteristics, and limiting conditions.

3. Include performance curves, with engineering data and tests.

4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

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

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

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E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

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

L. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.

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3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

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

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. The General Contractor and Roofing Filed Sub-Bidder shall each perform a 1-year warranty inspection.

F. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.

END OF SECTION

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SECTION 02 41 00

SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Selective Demolition work required to complete the work of the contract including all the Selective Demolition work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all accessories. Coordinate the Selective Demolition work with all the other trades for the project. Provide all Selective Demolition and disposal work to complete the re-roofing and related work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section and each Subcontractor for the entire project so that all the work can be properly and completely performed.

B. Selective Demolition work includes, but is not limited to:

1. Remove and dispose of all existing roofing systems in their entirety, including all shingles, underlayment, membrane, ballast, built-up roofing, cover boards, insulation, flashing, edge metal, sealants, crickets and other associated roofing materials and components, by the ROOFING AND FLASHING FILE SUB-BIDDER.
2. Remove and dispose of existing roof drains where indicated on the Drawings by the ROOFING AND FLASHING FILE SUB-BIDDER.
3. Remove and dispose of all existing gutters and downspouts, by the ROOFING AND FLASHING FILE SUB-BIDDER.
4. Remove and dispose of all roof hatches by the ROOFING AND FLASHING FILE SUB-BIDDER.

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5. Cut opening in masonry wall for relocated (raised) unit vent louvers in the Gymnasium, by the MASONRY FILED SUB-BIDDER.
6. Remove and Dispose of existing through-wall flashing and brick above at former bus drop-off shelter roofs, and to accommodate new through-wall flashing above new roofs 'L and 'Q', by the MASONRY FILED SUB-BIDDER.
7. Remove and dispose of abandoned steel pins in masonry wall at former bus drop-off shelter roofs, by the MASONRY FILED SUB-BIDDER.
8. Remove all existing delaminated masonry sealer at 100% of the existing brick masonry exterior walls, by the MASONRY FILED SUB-BIDDER.
9. Remove and dispose of existing brick, 4 courses high above deteriorated steel lintels, and remove and dispose of deteriorated steel lintel and through-wall flashing, by the MASONRY FILED SUB-BIDDER.
10. Cut, remove and dispose of unit masonry to accommodate beam pockets for new Roofs 'L' and 'Q', by the MASONRY FILED SUB-BIDDER.
11. Unit Price #1: Remove and dispose of deteriorated wood deck, by the ROOFING AND FLASHING FILE SUB-BIDDER. Refer to Unit Price Schedule for quantities.
12. Unit Price #2: Remove loose concrete at spalled concrete roof deck, by ROOFING AND FLASHING FILE SUB-BIDDER. Refer to Unit Price Schedule for quantities.
13. Unit Price #3: Remove and dispose of deteriorated brick, by MASONRY FILED SUB-BIDDER. Refer to Unit Price Schedule for quantities.
14. Unit Price #4: Cut and remove deteriorated mortar joints, by MASONRY FILED SUB-BIDDER. Refer to Unit Price Schedule for quantities.
15. Unit Price #5: Rout and remove all loose debris at cracks in the concrete foundation, by MASONRY FILED SUB-BIDDER. Refer to Unit Price Schedule for quantities.
16. Unit Price #6: Remove loose concrete at spalled concrete foundation and sawcut ¾ inch deep behind spall area, by MASONRY FILE SUB-BIDDER. Refer to Unit Price Schedule for quantities.
17. Remove and dispose of existing windows where indicated on the Drawings by the GENERAL BIDDER.
18. Sawcut and remove sections of existing concrete slab to accommodate concrete footing and steel posts for new Roofs 'L' and 'Q', by the GENERAL BIDDER.
19. Scrape all existing loose paint from all wood trim at the roof edge and all wood siding at the gable ends, by the PAINTING FILE SUB-BIDDER.
20. **ADD ALTERNATE #1**: In lieu of scraping paint from the existing wood trim at the cupola (by the Painting File Sub-Bidder), remove and dispose of all existing wood trim and louvers, and copper flashing, roof and weathervane, by the GENERAL BIDDER. Refer to Lead Paint Awareness specifications.
21. **ADD ALTERNATE #2**: In lieu of scraping paint from the existing wood trim at the roof edge and from the wood siding and louvers at the gable ends (by the Painting

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File Sub-Bidder), remove and dispose of all existing wood trim at the roof edge, and all siding and louvers at the gable ends, by the GENERAL BIDDER. Refer to Lead Paint Awareness specifications.

1.03 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary of Work: Limitations on Contractor's use of site and premises.

B. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

D. Section 07 01 50.19 - Preparation for Re-Roofing: Removal of existing roofing, roof insulation, flashing, trim, and accessories.

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:

1. Areas for temporary construction and field offices.
2. Areas for temporary and permanent placement of removed materials.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.
2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
3. Provide, erect, and maintain temporary barriers and security devices.

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4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
5. Do not close or obstruct roadways or sidewalks without permit.
6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Only remove what can be re-roofed with new materials in the same day or prior to impending weather.

D. Remove loose refuse and dispose off site.

E. Repair existing deck surfaces to provide smooth work surface for new roof system.

F. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

H. If hazardous materials are discovered during removal operations that are not indicated on the hazardous materials report, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.02 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

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3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 .

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.

1. Remove rotted wood, corroded metals; replace with new construction specified.
2. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.

1. Provide temporary protective sheeting over uncovered deck surfaces.
2. Provide for surface drainage from sheeting to existing drainage facilities.
3. Do not permit traffic over unprotected or repaired deck surface.
4. Prevent movement of structure; provide shoring and bracing if necessary.
5. Perform cutting to accomplish removals neatly and as specified for cutting new work.
6. Repair adjacent construction and finishes damaged during removal work.
7. Patch as specified for patching new work.

G. Protect the building, its contents and occupants from all damage from water, dust and debris. Restore all items to former condition.

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3.04 DEBRIS AND WASTE REMOVAL

A. Sweep roof surface clean of loose matter.

B. Remove debris, junk, and trash from site.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

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SECTION 02 82 13

ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 00 00 as part of this Section.

B. Limited Hazardous Building Materials Inspection Report prepared by Fuss & O'Neill EnviroScience, LLC (October 27, 2015).

C. Asbestos-Containing Building Materials Consulting Services letter report prepared by Fuss & O'Neill EnviroScience, LLC for the supplemental cupola inspection (July 22, 2016).

D. Section 024100 - Demolition.

E. Architectural Demolition Drawings (AD1-03, AD2-01, AD2-02, & AD2-03) prepared by CBI Consulting, Inc.

F. At a later time, a Non-Traditional Asbestos Abatement Work Practice (NTWP) Application may be prepared by a third-party, industrial hygiene firm and submitted to the Commonwealth of Massachusetts Department of Environmental Protection (MassDEP) for approval for work described herein.

1.02 SCOPE OF WORK

A. Work outlined in this Section includes all work necessary for the removal, packaging, transporting, and disposing of asbestos-containing materials (ACM) and asbestos-containing waste materials (ACWM) impacted during demolition activities (the "Work") to occur at the Barnstable Community Horace Mann Charter Public School located at 165 Bearses Way in Hyannis, Massachusetts (the "Site").

B. Work shall be performed by a MADLS-licensed Asbestos Abatement Contractor (the "Contractor") with certified Asbestos Workers and Supervisor(s). Training shall be in accordance with MADLS Regulation 453 CMR 6.00. Alternately, work involving the removal of non-friable, asphaltic roofing may be performed by workers with (minimum) 8-hour asbestos-awareness training specific to Category I non-friable, asbestos-containing, asphaltic roofing removal.

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C. This scope of work includes all necessary selective demolition to access ACM scheduled for abatement.

D. Pursuant to MADLS Regulation 453 CMR 6.13(2)(a)(5), work operations that involve the breaking, shearing, or slicing of Category I non-friable, asbestos-containing, asphaltic roofing materials are not subject to the requirements of MADLS Regulation 453 CMR 6.00, as long as the work does not result in the production of asbestos dust or the material becoming friable.

1.03 PROJECT DESCRIPTION

A. The Base Bid includes removal, packaging, transporting, and disposing ACM and ACWM, as identified herein, conducted by workers meeting the requirements of OSHA Title 29 CFR, Part 1926.1101 for Class I and II work. This shall include all necessary demolition to access ACM for abatement.

B. Materials, as discovered outside of those listed (either above or below), will be measured and paid or credited by unit prices to be negotiated prior to commencement of the Work. The quantities are estimates only and should be field-verified by the Contractor.

C. The following table summarizes the locations of the Base Bid work with estimated ACM quantities. Note quantities provided below are order-of-magnitude estimates only. Refer to the Demolition Drawings for specific locations.

BASE BID - ASBESTOS

MATERIAL TYPE	LOCATION	QUANTITY	NOTES
Barnstable Community Horace Mann Charter Public School			
Flashing-Fastener Sealants	Roofs	500 SF	1, 2
Window System Caulking	Exterior (Refer to Architectural Demolition Drawings AD2-03 & AD2-04)	6 Window Systems	3

SF = Square Feet

Notes:

1 Includes removal and disposal of impacted/contaminated flashing material and built-up curbing down to existing deck and/or masonry wall as ACWM.
2 Denotes material type is presumed to contain PCBs > 50 ppm and must be disposed of as PCB Bulk Product Waste (>50 PPM) at a permitted landfill.

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3 Denotes whole-component window system and lintel removal and disposal as required for replacement including, but not limited to, interior and/or concealed caulking, mastics/adhesives, and dampproofing materials.

A. A portion of the Work may be performed in multiple mobilizations, at different periods of time, in conjunction with other trades (i.e., other trades work, demolition work, etc.).

B. Safety Data Sheets (SDS) for chemicals to be used during the project must be submitted to the Consultant prior to chemicals being delivered to the Site.

C. Chemical strippers and/or encapsulants applied to any surface that will receive a new finish that requires an adhesive must be compatible with the application of the new finish. Coordination shall be made with the flooring installer for product/installation warranty (if applicable).

D. The Contractor shall be responsible for providing temporary water, power, and heat (as needed) at the Site to perform the Work. Temporary lighting within the work areas must be connected to ground-fault circuit interrupter (GFCI) power panels installed by a Commonwealth of Massachusetts-licensed electrician (permitted as required) and located outside of the work areas.

1.04 DEFINITIONS

A. The following definitions relative to asbestos abatement apply:

1. Abatement: Procedures to control fiber release from ACM; includes removal, encapsulation, and enclosure.
2. ACM: Asbestos-containing material(s).
3. Air Monitoring: The process of measuring the total airborne fiber concentration of an area or a person.
4. Amended Water: Water to which a surfactant (wetting agent) has been added.
5. Architect: CBI Consulting, Inc.
6. Asbestos: The name given to a number of naturally-occurring, fibrous silicates. This includes the serpentine and the amphiboles forms, and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically-altered.
7. Asbestos Abatement: Any activity to control fiber release from ACM; includes removal, encapsulation, enclosure, and repair.
8. Asbestos Abatement Project: All activities, including site preparation and clean-up, associated with asbestos abatement, from the time of initial arrival of the contractor on-site through obtaining an acceptable final clearance air sampling in the abatement areas(s) and/or removal of all abated ACM from the project site, whichever is later.

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9. Asbestos-Containing Waste Material (ACWM): Any friable ACM removed during a demolition/renovation project and anything contaminated in the course of a demolition/renovation project including asbestos waste from control devices, bags or containers that previously contained asbestos, contaminated clothing, materials used to enclose the work area during the demolition/renovation operation, and demolition/renovation debris.
10. Asbestos Felt: A product made by saturating felted asbestos with asphalt, or other suitable bindery, such as a synthetic elastomer.
11. Asbestos Fibers: Those particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.
12. Asbestos Project Designer: The MADLS-certified Asbestos Project Designer for this project is Mr. Dustin A. Diedricksen (Certification No. AD000037).
13. Asbestos Supervisor: Any employee of a MADLS-licensed Asbestos Abatement Contractor who possesses a valid MADLS certification and EPA accreditation as an Asbestos Supervisor.
14. Asbestos Work Area: A regulated area, as defined by OSHA Title 29 CFR, Part 1926.1101, where asbestos abatement operations are performed, which is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated areas for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
15. Asbestos Worker: Any employee of a MADLS-licensed Asbestos Abatement Contractor who possesses a valid MADLS certification and EPA accreditation as an Asbestos Worker.
16. Caulking: Resilient mastic compound often having a silicone bituminous or rubber base; used to seal cracks, fill joints, and prevent leakage.
17. Clean Room: An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of worker street clothes and protective equipment.
18. Competent Person: As defined by OSHA Title 29 CFR, Part 1926.1101, a Site representative who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. The Competent Person has authority to take prompt corrective measures and to eliminate such hazards during asbestos removal. The Competent Person shall be properly trained in accordance with EPA's Model Accreditation Plan (MAP).
19. Consultant: Fuss and O'Neill EnviroScience, LLC.
20. Containment: An enclosure which surrounds the location where ACM and/or other toxic or hazardous substance removal is conducted, and establishes a controlled work area.
21. Contractor: Any person, firm, corporation, or other entity who has a valid Asbestos Abatement Contractor license issued by MADLS for the purpose of entering into, or engaging in, asbestos abatement work.

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22. 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 three feet apart can form an airlock.
23. Dampproofing: Application of water-impervious materials to a surface (such as a wall) to prevent penetration of moisture, typically associated with below-grade surfaces and veneers.
24. Decontamination Enclosure System (Decon): A series of connected areas, with curtained doorways between adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
25. Encapsulant: A liquid material which can be applied to ACM, that controls the possible release of asbestos fibers either by creating a membrane over the surface (bridging encapsulant), or penetrating the material and binding its components together (penetrating encapsulant).
26. EPA: The United States Environmental Protection Agency.
27. Equipment Room: Any contaminated area or a room that is part of the worker decon with provisions for storage of contaminated clothing and equipment.
28. Fixed Object: Unit of equipment or furniture in the work areas that cannot be removed from the work area.
29. Friable ACM: Any material that contains greater than one percent (> 1%) asbestos as determined using the method specified in Title 40 CFR, Part 763, Appendix A, Subpart F, Section 1, via PLM, or is presumed to contain asbestos, that can be crumbled, pulverized, or reduced to powder by hand pressure (when dry).
30. Glazing Compound: Any compound used to hold glass in-place, also referred to as glazing putty.
31. HEPA Filter: High-Efficiency Particulate Air (HEPA) filter in compliance with ANSI Z9.2 1979.
32. HEPA-Filtered Work Area Ventilation System: A portable local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.
33. HEPA-Vacuum Equipment: Vacuum equipment where all the air drawn into the machine is expelled through a HEPA filter with none of the air leaking past it and with a HEPA-filter as the last filtration stage.
34. MADLS: The Commonwealth of Massachusetts Department of Labor Standards.
35. MassDEP: The Commonwealth of Massachusetts Department of Environmental Protection.
36. Movable Object: Unit of equipment of furniture in the work area that can be removed from the work area.
37. NESHAP: National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.

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38. Non-Friable ACM: Any material that contains > 1% asbestos as determined using the method specified in EPA Title 40 CFR, Part 763, Appendix A, Subpart F, Section 1, via PLM, or is presumed to contain asbestos, that cannot be crumbled, pulverized, or reduced to powder by hand pressure (when dry).
39. NPE: Negative Pressure Enclosure.
40. OSHA: The Occupational Safety and Health Administration.
41. Owner: Town of Barnstable.
42. Permissible Exposure Limit (PEL): The maximum total airborne fiber concentration to which an employee is allowed to be exposed. The new limit established by OSHA Title 29 CFR, Part 1926.1101 is 0.1 fibers/cc as an eight (8)-hour time-weighted average (TWA), and 1.0 fibers/cc averaged over a sampling period of thirty (30) minutes as an Excursion Limit. The Contractor shall be responsible for maintaining work areas in a manner that this standard is not exceeded.
43. Project Monitor: A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or a Consultant with experience in asbestos air monitoring, personal protection equipment, and abatement 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.
44. RCRA: The Resource Conservation and Recovery Act (EPA Title 40 CFR, Parts 260 - 265).
45. Regulated Area: An area established by the employer to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area, within which, total airborne fiber concentrations exceed, or there is a reasonable possibility that they may exceed, the PEL.
46. Shower Room: A room between the Clean Room and the Equipment Room in the decon with hot and cold running water suitably arranged for employee showering during decontamination. The Shower Room is located in an airlock between the contaminated area and the clean area.
47. Site: The Barnstable Community Horace Mann Charter Public School located at 165 Bearses Way in Hyannis, Massachusetts.
48. Surfactant: A chemical wetting agent added to water to improve penetration into ACM.
49. Totally-Enclosed Manner: A manner that will ensure no exposure of human beings or the environment to a concentration of asbestos.
50. Transport Vehicle: A motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (e.g., trailer, railroad freight car) is a separate transport vehicle.
51. TWA: Time-Weighted Average.

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52. Waterproofing: Material, usually a membrane or applied compound (tar/mastic), used to make a surface impervious to water, includes concealed conditions (applications around doors, windows, and in wall cavities). Sometimes combined with felts.

1.05 CONSULTANT

A. The Owner/Architect shall retain a third-party, industrial hygiene firm (the "Consultant") for the purposes of project management and monitoring during Asbestos Abatement activities. At the discretion of the Owner/Architect, the Consultant will represent the aforementioned during the abatement project. The Contractor will regard the Consultant's direction as authoritative and binding, as provided herein, in matters particularly, but not limited to the following:

1. Work area approval.
2. Monitoring results review.
3. Completion of the various work segments.
4. Final abatement completion.
5. Data submission.
6. Daily field punch list items.

B. The Commonwealth of Massachusetts Department of Labor Standards (MADLS) Asbestos Consultant - Project Designer for this Asbestos Abatement Project is Mr. Dustin A. Diedricksen (Certification No. AD000037).

1.06 USE OF THE CONTRACT DOCUMENTS

A. It shall be incumbent upon the Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the Contractor's failure to visit the Site and understand the existing conditions.

B. All work shall comply with the Contract Documents and with applicable codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern the Work.

C. It is not intended that this Section show every detail of the Work, but the Contractor shall be required to furnish, within the Contract Sum, all material and labor necessary for the completion of the Work in accordance with the intent of this Section.

D. In case of ambiguity among the Contract Documents, the more stringent requirement, as determined by the Consultant, shall prevail.

E. The Work includes making modifications as necessary, subject to approval by Owner in consultation with the Consultant, to correct any conflicts.

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F. All items not specifically mentioned in the Contract Documents, but implied by trade practices to complete the Work, shall be included.

1.07 SITE EXAMINATION

A. It is understood that the Contractor has examined the Site and made their own estimates of the facilities and difficulties attending the execution of the Work and has based their price thereon.

B. Except for unforeseeable concealed conditions as determined by the Consultant, the Contractor shall make no claim for additional cost due to the existing conditions at the Site.

1.08 CONTRACTOR QUALIFICATIONS

A. The Contractor shall submit a record of prior experience in asbestos abatement projects, listing no less than three completed projects in the past year of similar size and scope. The Contractor shall list the experience and training of the Asbestos Supervisor and the Asbestos Abatement Workers The information that should be included is as follows:

1. Project Name and Address
2. Owner’s Name and Address
3. Architect’s Name
4. Consultant’s Name
5. Contract Amount
6. Date of Completion
7. Extras and Changes

B. The Contractor selected must currently hold a valid MADLS Asbestos Abatement Contractor license.

C. Submit a written statement regarding whether the Contractor has ever been cited for non-compliance with federal, state, or local asbestos regulations pertaining to worker protection, removal, transport, or disposal.

1.09 ADDITIONAL GENERAL REQUIREMENTS

A. The Contractor shall employ a competent, MADLS-certified Asbestos Abatement Supervisor with at least three years of experience on projects of similar scope and magnitude, who shall be responsible for all work involving asbestos abatement as described in the Contract Documents and defined in applicable regulations and have full-time, daily supervision of the same. The Supervisor shall be the competent person as defined by Occupational Safety and Health Administration (OSHA) regulations.

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B. If required by federal, state, local, or any other authorities having jurisdiction over such work, the Contractor shall allow the Work of this contract to be inspected. The Contractor shall immediately notify the Owner, Architect, and Consultant and shall maintain written evidence of such inspection for review by the aforementioned parties.

C. The Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.

D. The Contractor shall immediately notify the Owner, Architect, and Consultant of the delivery of all permits, licenses, certificates of inspection, of approval, or of occupancy, etc., and any other such instruments required under codes by authorities having jurisdiction, regardless of who issued, and shall cause them to be displayed to the aforementioned parties for verification and recording.

1.10 SUBMITTALS

A. The Contractor shall submit the following to the Consultant, in one complete package, prior to the pre-construction meeting and at least ten (10) business days before the start of the Work:

1. Submit a schedule to the Owner/Architect and the Consultant 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. Submit copies of all notifications, permits, applications, licenses and like documents required by federal, state, or local regulations obtained or submitted in proper fashion. The Contractor's supervisor and laboratory information (Fuss & O'Neill EnviroScience, LLC - AA000198) submitted on Asbestos Notification Form (ANF-001) must be accurate or a revision will be required.
3. Submit the name and address of the hauling contractor and the landfill to be used. Also, submit current, valid operating permits and certificates of insurance for the transporter and landfill.
4. Submit photographic or video documentation showing the building conditions prior to the start of work. The Contractor shall be held responsible for all damage to the building and its contents not shown on the pre-construction documentation. The Contractor shall note if this does not apply since the documentation was collected by others (i.e., General Contractor).
5. Submit a detailed, site-specific work plan including, but not limited to, decon construction, work area isolation, and removal methods.
6. Submit the training, medical, and respirator fit test records as well as a current, valid MADLS certification of each employee who may be on the Site.

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7. If the Contractor's MADLS-certified Asbestos Abatement Supervisor is not conducting OSHA-required employee exposure monitoring, submit the name, address, and qualifications of the air sampling professional that the Contractor proposes to use on this project for this task. The Contractor shall note if this does not apply.
8. Submit the name, address, and qualifications of proposed laboratories intended to be utilized for Contractor personal air sampling analysis as required by this Section.
9. Submit detailed product information on all materials and equipment proposed for asbestos abatement work on this project. This includes all SDS for products and chemicals that may be used on the project.
10. Submit pertinent information regarding the qualifications of the Project Supervisor (competent person) for this project, as well as a list of past projects completed.
11. Submit a chain-of-command for the project. The chain-of-command should include the name, title, and contact number for each person listed.
12. 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.
13. Submit a written, site-specific Respiratory Protection Program for employees undertaking the Work, including make, model, and National Institute of Occupational Safety and Health (NIOSH) approval numbers of respirators to be used at the Site. The Contractor shall note if the Respiratory Protection Program is not required at the Site and why.
14. Submit the proposed electrical safeguards to be implemented by a Commonwealth of Massachusetts-licensed electrician, including but not limited to: location of transformers, GFCI outlets, lighting, and power panels necessary to safely perform the Work, including a description of electrical hazards and a safety plan for common practices in the work area. This may also include a safety plan for temporary lighting, extension cords, and other powered equipment used in the work area (locations, daily inspections, etc.).
15. Submit the proposed worker orientation plan that, at a minimum, includes a description of asbestos hazards and abatement methodologies, a review of worker protection requirements, and the outline of safety procedures.

No work on the Site will be allowed to begin until the Owner/Architect and the Consultant approve the Pre-Construction Submittals. Any delay caused by the Contractor's refusal or inability to submit this documentation in a timely manner does not constitute a cause for change order or a time extension.

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B. The Contractor shall submit the following to the Consultant during the Work:

1. Copies of training, MADLS certifications, respirator fit test records, and medical records for new employees to start work 24 hours in advance of the new employee arriving at the Site.

C. The Contractor shall submit the following to the Owner at the completion of the Work. The Owner reserves the right to retain payment(s) until all items are received in completion:

1. Original final completed copies of the WSR, signed by all transporters and the designated disposal site owner/operator.
2. Original final completed copies of weight tickets, recycling tickets, and manifests for all specified materials.
3. Contractor's logs (daily activity logs, daily sign in sheets, containment sign-in sheets), and all worker training, MADLS certifications, medical records, and respirator fit test records.
4. Copies of all OSHA personal monitoring results.

1.11 REGULATIONS AND STANDARDS

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. EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) Regulations (Title 40 CFR, Part 61, Subpart M).
2. EPA Asbestos Hazards Emergency Response Act (AHERA) Regulations (Title 40 CFR, Part 763, Subpart E).
3. OSHA Asbestos Regulations (Title 29 CFR, Parts 1910.1001 and 1926.1101).
4. Department of Transportation (DOT) Hazardous Waste Transportation Regulations (Title 49 CFR, Parts 170 - 180).
5. MassDEP Asbestos Regulations (310 CMR 7.00 and 7.15).
6. MADLS "The Removal, Containment or Encapsulation of Asbestos" Standards for Asbestos Abatement (453 CMR 6.00).
7. Life Safety Code, National Fire Protection Association (NFPA).
8. 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 (UL).

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1.12 EXEMPTIONS

A. Any deviations from the Contract Documents require the written approval and authorization from the Owner and Consultant. Any deviations that may impact the bid cost shall be delineated with the bid for the Owner to review.

B. Any modifications from the standard work practices identified in MADLS Regulations 453 CMR 6.00 or MassDEP Regulations 310 CMR 7.00 and 7.15 must be requested in writing and approved in writing by both regulatory agencies. The Consultant shall develop a Non-Traditional Asbestos Abatement Work Practice (NTWP) on behalf of the Owner. If the Contractor intends to request a NTWP for this project, the nature of the NTWP shall be disclosed in the Bid Documents, and the cost savings associated with said NTWP shall be provided for Owner's consideration. A NTWP shall not be filed without prior Owner and Consultant approval.

1.13 FINAL RE-OCCUPANCY AIR CLEARANCE

A. Following the completion of the encapsulation phase of the Work, the Consultant shall collect final re-occupancy clearance air samples inside the negative pressure enclosure (NPE) work area per MADLS regulatory requirements for re-occupancy.

B. The Owner shall be responsible for payment of the sampling and analysis of the initial final clearance air samples only. If the first set of samples fails to satisfy the re-occupancy criteria, the Contractor shall be responsible for payment of all costs associated with the collection and analysis of additional final clearance air samples.

C. The Contractor shall not conduct demolition or other removal activities during final clearance air sampling for re-occupancy.

D. Exterior asbestos abatement work: Re-occupancy clearance air sampling is not required following removal if abatement activities fall under MassDEP Regulation 310 CMR 7.15(10), (11), or (12) and NPEs are not utilized. If abatement activities would render non-friable ACM friable, the Work must be performed within a NPE and final re-occupancy air clearance sampling will be conducted.

1.14 NOTIFICATIONS, POSTINGS, SUBMITTALS, AND PERMITS

A. The Contractor shall make the following notifications and provide the submittals to the following agencies prior to the start of work. Submissions may be made electronically on eDEP File. This notification is required ten (10) calendar days prior to the start of the abatement project. The supervisor and laboratory information (Fuss & O'Neill EnviroScience, LLC - AA000198) submitted on the form must be accurate or a revision will be required.

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1. Commonwealth of Massachusetts Department of Environmental Protection
   Asbestos Program
   Enforcement Division
   P.O. Box 4062
   Boston, MA 02211

2. Commonwealth of Massachusetts Department of Labor Standards
   19 Staniford Street, 2nd Floor
   Boston, MA 02114

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

1. Building Owner/Operator Name and address.
2. Building location.
3. Building size, age, and use.
4. Amount of asbestos to be removed.
5. Asbestos Abatement Supervisor Name and Certification Number.
6. Laboratory Analytical Name and License Number.
7. Work schedule, including proposed start and completion date.
8. Asbestos removal procedures to be used.
9. Name and location of disposal site for generated asbestos waste, residue, and debris.

1.15 WORK SITE SAFETY PLAN

A. The Contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the Site. The safety plan should include provisions for the following:

1. Injured worker evacuation.
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.
5. A method to notify building occupants in the event of a fire or other emergency requiring building evacuation.

B. The Contractor shall be responsible for training all workers in these procedures.

1.16 INDEPENDENT AIR SAMPLING AND ASBESTOS ABATEMENT MONITORING

A. This Subsection describes independent air sampling work being performed on behalf of, and paid for by, the Owner. This Subsection describes air monitoring conducted by the Consultant to verify that the building, beyond the work area, and the outside environment remains uncontaminated. Personal air monitoring required by OSHA is work to be

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performed by the Contractor and is within the Contract Sum. A negative exposure assessment will not be reviewed and/or approved by the Consultant; it shall be the Contractor's responsibility to determine its validity.

B. The purpose of the Consultant's air monitoring is to verify proper engineering controls in the work areas including, but not limited to:

1. Building contamination outside the work area by airborne fibers.
2. Filtration failure or differential pressure system rupture.
3. Air contamination outside the building envelope by airborne fibers.

C. If any of the above occurs, the Contractor shall immediately cease Asbestos Abatement activities until the fault is made correct. Do not recommence work until authorized by the Consultant.

D. The Consultant may monitor total airborne fiber concentrations outside the work area. The purpose of this air monitoring will be to detect total airborne fiber concentrations outside the NPE, which may challenge the effectiveness of the work area isolation procedures to protect the ambient areas inside and at the exterior of the Site.

E. To determine if the elevated total airborne fiber concentrations encountered during abatement operations have been reduced to an acceptable level, the Consultant will sample and analyze ambient air in accordance with final clearance air sampling requirements.

F. The Consultant may perform on-site monitoring throughout the project, as follows:

1. All work procedures may be monitored by the Consultant to assure that areas outside the designated work areas will not be contaminated.
2. Prior to work on any given day, the Contractor's designated "competent person" shall discuss the day's work schedule with the Consultant to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the Site or the employees. This includes a visual inspection of the work area and the decon.

1.17 CONTRACTOR'S AIR SAMPLING RESPONSIBILITY

A. The Contractor shall independently retain an air-sampling professional or the MADLS-certified Asbestos Abatement Supervisor shall monitor total airborne fiber concentrations in the worker breathing zones to establish conditions and work procedures for maintaining compliance with OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.

B. The Contractor's air sampling professional shall document all air sampling results and provide a report to the Consultant within 48 hours after sample collection.

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C. All air sampling shall be conducted in accordance with methods described in OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.

1.18 PROPER WORKER PROTECTION

A. This Subsection describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

B. All workers are to be accredited as Abatement Workers as required by the EPA AHERA Title 40 CFR, Parts 763 Appendix C to Subpart E, February 3, 1994.

C. The Contractor is required to be certified and accredited as required by MADLS.

D. In accordance with OSHA Title 29 CFR, Part 1926, all workers shall receive a training course covering the dangers inherent in handling asbestos, the dangers of breathing asbestos dust, proper work procedures, and proper worker protective measures. This course must include, but is not limited to the following:

1. Methods of recognizing asbestos
2. Health effects associated with asbestos
3. Relationship between smoking and asbestos in producing lung cancer
4. Nature of operations that could result in exposure to asbestos
5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
    a. Engineering controls
    b. Work Practices
    c. Respirators
    d. Housekeeping procedures
    e. Hygiene facilities
    f. Protective clothing
    g. Decontamination procedures
    h. Emergency procedures
    i. Waste disposal procedures
6. Purpose, proper use, fitting, instructions, and limitations of respirators as required by OSHA Title 29 CFR, Part 1910.134
7. Appropriate work practices for the work
8. Requirements of medical surveillance program
9. Review of OSHA Title 29 CFR, Part 1926
10. Pressure Differential Systems
11. Work practices including hands on or on job training
12. Personal Decontamination procedures
13. Air monitoring, personal and area

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E. The Contractor shall provide medical examinations for all workers who may encounter a total airborne fiber concentration of 0.1 fibers/cc or greater for an 8-hour TWA. In the absence of specific airborne fiber data, provide medical examinations for all workers who will enter the work area for any reason. Examination shall, at a minimum, meet OSHA requirements as set forth in Title 29 CFR, Part 1926. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

F. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:

1. Non-essential personnel are prohibited from entering the work area.
2. All authorized personnel entering the work area shall read the "Worker Protection Procedures" that are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing.
3. All personnel who are exiting from the decon shall be properly decontaminated.
4. Asbestos waste that is removed from the work area must be properly bagged and labeled in accordance with these Specifications. Asbestos waste removed from a NPE must be immediately transported off-site or immediately placed in locked, posted temporary storage on-site, and removed within 24 hours of the project conclusion.
5. Any materials, equipment, or supplies that are removed from the decon shall be thoroughly cleaned and decontaminated by wet-cleaning methods and/or HEPA vacuuming of all surfaces.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the brand name, manufacturer name, and product technical description.

B. The Contractor shall have a sufficient inventory of, or dated purchase orders for, materials necessary for the Work (e.g., protective clothing, respirators, respirator filter cartridges, polyethylene (poly) sheeting of proper size and thickness, tape, spray adhesive, air filters, etc.).

C. Damaged or deteriorating materials are not permitted for use and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed as ACWM.

D. Poly sheeting (packaged in a roll to minimize the frequency of joints) shall be delivered to the Site with factory label indicating four (4) or six (6)-mil thickness.

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E. Poly disposable bags shall be 6-mil with OSHA-required pre-printed labels (OSHA Title 29 CFR, Part 1926.1101(k)(8)(iii)).

F. Tape or adhesive spray shall be capable of sealing joints in adjacent poly sheeting, and shall be able to attach poly sheeting to finished or unfinished surfaces of dissimilar materials. Tape and adhesive spray shall also be capable of adhering under both dry and wet conditions (including use of amended water).

G. Surfactant (wetting agent) shall consist of fifty percent (50%) polyoxyethylene ether and 50% polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of 1 ounce surfactant to 5 gallons of water, or as directed by manufacturer.

H. Removal encapsulant shall be non-flammable, factory-prepared penetrating chemical encapsulant deemed acceptable by the Consultant. Usage shall be in accordance with manufacturer's printed technical data.

I. The Contractor shall have spray equipment capable of mixing wetting agent with water. Spray equipment shall be capable of generating sufficient pressure and volume; the hose length must reach all areas within the work area.

J. Impermeable containers shall 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 Title 29 CFR, Part 1926.1101(k)(8)(iii) [June 1, 2015 requirements]. Containers must be airtight and watertight.

K. Labels and signs, as required by OSHA Title 29 CFR, Part 1926.1101, will be used.

L. Encapsulant shall be bridging or penetrating type which has been deemed acceptable by the Consultant. Usage shall be in accordance with manufacturer's printed technical data.

2.02 TOOLS AND EQUIPMENT

A. The Contractor shall provide all clean tools and equipment necessary for asbestos removal, encapsulation, and enclosure.

B. The Contractor's air monitoring professional or Abatement Supervisor shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements. The equipment shall function properly and air samples shall be calibrated with a recently calibrated (within 6 calendar months) rotometer.

C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the Work, including protective clothing, respirators, respirator filter cartridges, poly sheeting of proper size and thickness, tape, spray adhesive, and air filters.

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D. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and/or electrical power sources (e.g., generators, etc.). Any electrical-connection work affecting the building electrical power system shall be performed by a Commonwealth of Massachusetts-licensed electrician, permitted as required.

E. The Contractor shall be responsible for coordinating electrical and water services, and shall pay for these services for the duration of the project (if applicable).

F. The Contractor shall assist the Consultant by providing necessary tools and equipment (e.g., coveralls, ladders, extension cords, lighting, etc.) for the Consultant to perform project monitoring activities (e.g., final visual inspection(s), in-progress and final clearance air sampling, etc.). The Consultant reserves the right to reject such items that are deemed unsafe and/or do not function properly, and may request items be replaced with adequate replacements. The work areas must be safe to enter/occupy by the Consultant at all times.

G. The Contractor shall have available shower stalls and plumbing, including sufficient hose length and drain system, or an acceptable alternate.

H. The HEPA-filtered work area ventilation systems shall contain HEPA filter(s) and be capable of sustaining sufficient air exhaust to create a minimum negative air pressure of -0.02 inches of water column within NPE with respect to the outside area. Digital monometers shall be supplied for Class 1 work. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of 4 air changes per hour within the NPE. No air movement system or air-filtering equipment shall discharge unfiltered air outside the work area. The Contractor will have reserve units so that system will operate continuously.

I. HEPA-Vacuum Equipment, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. A pre-construction meeting may be scheduled prior to the start of Work. The Contractor must attend this meeting (as required by the Owner); the assigned Asbestos Abatement Supervisor must also attend this meeting.

B. The Contractor shall present a detailed project schedule and project submittals at the pre-construction meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and the Consultant will inform the Contractor of any scheduling adjustments for this project.

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C. Following the pre-construction meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.02 WORK AREA PREPARATION - NEGATIVE PRESSURE ENCLOSURE (NPE)

A. Where necessary, deactivate electrical power, including receptacles and light fixtures. Under no circumstances during the decontamination procedures will lighting fixtures be permitted to be operating when amended water spray may contact the fixture. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All installations are to be made by a Commonwealth of Massachusetts-licensed electrician (permitted as required) and located outside the work areas.

B. Temporary power shall be continuous power. Portable generators are not authorized for use during interior asbestos abatement without an approved NTWP.

C. HEPA-filtered work area ventilation systems shall be utilized during the installation of enclosures and supports where ACM may be disturbed.

D. Deactivate and/or isolate heating, ventilating, and air conditioning (HVAC) systems or zones to prevent contamination and fiber dispersal to other areas of the building or structure. During the Work, vents within the work area shall be covered with two (2) layers of 6-mil poly sheeting completely sealed with duct tape. If deactivation is not possible, isolation shall include a hard barrier, such as plywood or rigid-foam insulation board, securely affixed to active duct openings prior to covering with 2 layers of 6-mil poly sheeting completely sealed with duct tape.

E. The Contractor shall be responsible for removing furniture, equipment, and any other materials to be salvaged from the work areas. The Contractor shall be responsible for removing all solid waste within the work areas. The Contractor shall pre-clean moveable objects within the proposed work areas using HEPA-vacuum equipment and/or wet-cleaning methods as appropriate and remove such objects from work areas.

F. Completely seal all openings including, but not limited to, windows, corridors, doorways, skylights, ducts, grills, diffusers, and any other work area penetrations with 6-mil poly sheeting sealed with duct tape. This includes doorways and corridors that will not be used for passage during work.

G. Pre-clean fixed objects within the work areas with HEPA-vacuum equipment and/or wet-cleaning methods as appropriate, and enclose with 6-mil poly sheeting completely sealed with duct tape.

H. Clean the proposed work areas using HEPA-vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

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I. After HEPA-vacuum cleaning, where wall materials are not being abated, cover fixed walls with 2 layers of 4-mil poly sheeting. Where fixed walls do not form a barrier, 2 layers of 6-mil poly sheeting shall be applied to a rigid framework of wood, metal, or polyvinyl chloride (PVC). Where flooring materials are not being abated, cover the floor with 2 layers of 6-mil poly sheeting. Where ceiling materials are not being abated, cover ceilings with 2 layers of 4-mil poly sheeting in accordance with current MassDEP Regulation 310 CMR 7.15(7)(c)(6). All overlaps shall be completely sealed with tape and spray adhesive.

J. Pursuant to MassDEP Regulation 310 CMR 7.15(7)(c)(4), large openings such as open doorways, elevator doors, and passageways shall be first sealed with solid construction materials, such as plywood over studding, which shall constitute the outermost boundary of the Asbestos Abatement work area. All cracks, seams, and openings in such solid construction materials shall be caulked or otherwise sealed, so as to prevent the movement of asbestos fibers out of the work area.

K. Maintain emergency and fire exits from the work areas, or establish alternate exits satisfactory to fire officials.

L. Clean and remove ceiling-mounted objects, such as lights and other items not sealed-off, which interfere with asbestos abatement. Use hand-held, amended water sprayers or HEPA-vacuum equipment during fixture removal to reduce settled fiber dispersal.

M. Create pressure differential between work areas and adjacent unregulated areas by the use of acceptable HEPA-filtered work area ventilation systems sufficient to provide 4 air changes per hour, and create a negative air pressure of -0.02 inches of water column within the NPE with respect to the adjacent area as measured on a manometer.

N. If a Consultant is retained for pre-abatement services, the Contractor and the Consultant shall visually inspect barrier several times daily to assure an effective seal and the Contractor shall repair defects immediately.

3.03 WORK AREA PREPARATION - EXTERIOR WINDOW SYSTEM ABATEMENT

A. This Subsection only applies to exterior window caulking/glazing compounds pursuant to MassDEP Regulation 310 CMR 7.15(11). All other ACM abatement work area preparations must follow Subsection 3.2, unless a NTWP is submitted to, and approved by, MassDEP.

B. Work is to be conducted from the building exterior. Completely seal all openings including, but not limited to, windows, doors, ventilation openings, drains, grilles, diffuser grates, and any other penetration into the work areas with 2 layers of 6-mil poly sheeting completely sealed with tape and spray adhesive.

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C. Window openings shall be isolated from the building interior on the interior side using 2 layers of 6-mil poly sheeting sealed with tape and spray adhesive.

D. Provide 2 layers of 6-mil poly sheeting on exterior ground surface extending to a minimum of ten (10) feet from the building perimeter where ACM and/or ACWM are to be removed. Poly sheeting shall be attached to the building foundation with tape and spray adhesive.

E. Movable lifts or staging platforms to be used during abatement shall be protected with 2 layers of 6-mil poly sheeting.

F. Pre-clean fixed objects within the work areas using HEPA-vacuum equipment and wet-cleaning methods, as appropriate, and enclose with 6-mil poly sheeting sealed with tape.

G. Clean the proposed work areas using HEPA-vacuum equipment and wet-cleaning methods, as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

H. Post asbestos warning signs, in accordance with OSHA Title 29 CFR, Part 1926.1101, at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read them and take precautionary measures to avoid exposure to asbestos.

I. Maintain emergency and fire exits from the work area or establish alternative exits satisfactory to fire officials.

3.04 WORK AREA PREPARATION - ASPHALTIC ROOFING AND SEALANTS ABATEMENT

A. This Subsection only applies to asphaltic roofing materials pursuant to MassDEP Regulation 310 CMR 7.15(10). All other ACM abatement work area preparations must follow Subsection 3.2, unless a NTWP is submitted to, and approved by, MassDEP.

B. Work is to be conducted from the building exterior. Completely seal all openings at the roof level including, but not limited to, windows, doors, ventilation openings, drains, grilles, diffuser grates, and any other penetration into the work areas with 2 layers of 6-mil poly sheeting completely sealed with tape and spray adhesive.

C. Provide 2 layers of 6-mil poly sheeting on exterior ground surface extending to a minimum of ten (10) feet from the building perimeter where ACM and/or ACWM are to be removed. Poly sheeting shall be attached to the building foundation with tape and spray adhesive.

D. Provide 2 layers of 6-mil poly sheeting on exterior ground surface extending to a minimum of ten (10) feet around any waste receptacle.

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E. Movable lifts or staging platforms to be used during abatement shall be protected with 2 layers of 6-mil poly sheeting.

F. Pre-clean fixed objects within the work areas (e.g., air handling units, roof-top fans, etc.) using HEPA-vacuum equipment and wet-cleaning methods, as appropriate, and enclose with 6-mil poly sheeting sealed with tape.

G. Clean the proposed work areas using HEPA-vacuum equipment and wet-cleaning methods, as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

H. Post asbestos warning signs, in accordance with OSHA Title 29 CFR, Part 1926.1101, at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read them and take precautionary measures to avoid exposure to asbestos.

I. If a Consultant is retained for pre-abatement services, the Contractor and the Consultant shall visually inspect barrier several times daily to assure effective seal and the Contractor shall repair defects immediately.

J. Maintain emergency and fire exits from the work area or establish alternative exits satisfactory to fire officials.

3.05 DECONTAMINATION ENCLOSURE SYSTEM (DECON)

A. The Contractor shall establish, contiguous to the work area, a three-chamber decon consisting of (in-series) equipment room, shower room, and clean room. The only access between contaminated and uncontaminated areas shall be through this decon. If it is not feasible to erect a contiguous decon, the Contractor shall establish a remote decon in as close proximity to the work area as is feasible. For abatement not requiring a NPE, the Contractor shall establish a remote decon at the perimeter of the regulated work area. Use of a remote decon shall be specified on the Contractor's Asbestos Notification Form (ANF-001).

B. Access between rooms in the decon shall be through double-flap, curtained openings. The clean room, shower room, and equipment room within the decon shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.

C. If feasible, the Contractor shall establish, contiguous with the work area, an equipment decon consisting of 2 totally-enclosed chambers divided by a double-flapped, curtained opening. No personnel are permitted to enter or exit through this unit.

D. Construct the decon with wood or metal framing, cover both sides with 2 layers of 6-mil poly sheeting, completely sealed with spray adhesive, and taped at the joints.

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3.06 ASBESTOS REMOVAL PROCEDURE - GENERAL

A. Prior to the removal of ACM, the Contractor shall ensure that work area preparations have been conducted in accordance with applicable Subsections of this Section.

B. The Contractor shall have a MADLS-licensed Asbestos Supervisor on the Site at all times to ensure establishment of a proper NPE and proper work practices throughout project.

C. If a Consultant is retained for pre-abatement services, abatement work shall not commence until authorized by the Consultant.

D. The Contractor shall properly coordinate abatement work with other trades, new construction, and Site use. The Contractor shall be responsible for addressing any concerns to the Owner and/or Consultant.

E. With a fine mist, spray ACM/ACWM with amended water using airless spray equipment or apply an approved removal wetting agent to reduce the release of fibers during removal operation.

F. Remove wet ACM/ACWM in manageable sections to keep fiber concentrations to a minimum. Material drop shall not exceed 8 feet. For heights up to 15 feet, provide inclined chutes or scaffolding to intercept drop.

G. Remove ACM/ACWM by standard methods, as appropriate. Fill disposal containers as removal proceeds; seal filled containers and clean containers before removal to equipment decon. Wet clean each container thoroughly, double bag, and apply caution labels, if required.

H. After completion of stripping work, all surfaces from which ACM/ACWM have been removed shall be wet brushed, using a nylon brush, wet-wiped, and sponged or cleaned by an equivalent method to remove all visible material (wire brushes are prohibited). During this work, the surfaces being cleaned shall be kept wet.

I. Remove and containerize all visible accumulations of ACM and ACWM. During cleanup, utilize brooms, non-metal dustpans, and rubber squeegees to minimize damage to floor covering. Non-porous materials (i.e., metal) to be removed from the work area during abatement activities for recycling/disposal as solid waste shall be cleaned and visually inspected by an Asbestos Project Monitor prior to removal from work areas.

J. Sealed disposal containers, and all equipment used in the work area, shall be included in the cleanup and shall be removed from work areas via the equipment decon at an appropriate time in the cleaning sequence. All asbestos waste in 6-mil poly disposal bags shall be double-bagged in the equipment decon before removal from the Site.

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K. At any time during asbestos removal, should the Consultant suspect contamination of areas outside the work area(s), they shall cause all abatement work to stop until the Contractor takes the necessary steps to decontaminate these areas and eliminate the causes of such contamination. Unprotected individuals shall be prohibited from entering suspected contaminated areas until air sampling and visual inspections verify decontamination.

L. After completion of the initial final cleaning procedure, including removal of the inner layers of poly sheeting but prior to encapsulation, a pre-sealant inspection shall be conducted by the Consultant. The pre-sealant inspection shall verify that ACM and residual dust has been removed from the work area.

3.07 ASBESTOS REMOVAL PROCEDURES - EXTERIOR WINDOW SYSTEMS

A. Work shall be conducted from the building exterior pursuant to MassDEP Regulation 310 CMR 7.15(11) - Requirements for Window Painting and/or Repair Work that Result in the Disturbance of Asbestos-Containing Glazing and/or Caulking Compounds.

B. It will be at the discretion of the Consultant to determine if removal procedures will render ACM friable, thus requiring additional dust control measures to prevent airborne asbestos fiber concentrations and/or environmental contamination.

C. Spray ACM with amended water using airless spray equipment or apply an approved wetting agent to reduce fiber release during removal operations.

D. Window sashes with asbestos-containing glazing compound shall be removed and wrapped in 2 layers of 6-mil poly sheeting for disposal as ACWM.

E. Asbestos-containing exterior caulking shall be wet-misted and removed from window and door frames. Asbestos caulking shall be placed in double 6-mil poly disposal bags.

F. Asbestos-containing caulking shall be removed from rough openings including masonry, lintels, and sills by wet-misting. Caulking may be covered with non-asbestos silicone-type caulking that must be removed to completely access and abate asbestos-containing caulking from window and door systems. All debris shall be placed in double 6-mil poly disposal bags for disposal as ACWM.

G. Upon removal, caulking, glazing compound, and/or window system frames to be disposed shall be wrapped in 2 layers of 6-mil poly sheeting or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.

H. Surrounding surfaces, such as exterior brick/block, remaining window surfaces, etc. shall be thoroughly cleaned with HEPA-vacuum equipment and wet-wiped to remove all visible dust and debris.

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I. Once the Consultant completes their final visual inspection, the Contractor shall remove protective the poly sheeting by rolling in all 4 corners towards the center.

J. Check all ground surfaces in work areas after removal is complete and the protective ground poly drop cloths have been removed. Remove and dispose any suspect ACM observed on the ground.

3.08 ASBESTOS REMOVAL PROCEDURES - EXTERIOR ROOFING SEALANTS

A. Pursuant to MADLS Regulation 453 CMR 6.13(2)(a)(5), work operations that involve the breaking, shearing, or slicing of Category I non-friable, asbestos-containing, asphaltic roofing materials are not subject to the requirements of MADLS Regulation 453 CMR Part 6.00, as long as the work does not result in the production of asbestos dust or the material becoming friable.

B. Work shall be conducted pursuant to MassDEP Regulation 310 CMR 7.15(10).

C. Asbestos-containing sealants shall be wet-misted to reduce the release of fibers and removed from surfaces.

D. Asbestos-containing sealants shall be removed from all surfaces (i.e., masonry, wood, etc.). Sealant may be covered with non-asbestos silicone type caulking that must be removed to completely remove asbestos-containing caulking from surfaces. Caulking in contact with asbestos caulking shall be placed in double 6-mil poly disposal bags for disposal as ACWM.

E. Upon removal, sealants and any flashing material removed shall be wrapped in 2 layers of 6-mil poly sheeting or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.

F. Pursuant to MassDEP Regulation 310 CMR 19.000, asbestos-containing, asphaltic roofing materials may be disposed in any landfill permitted by MassDEP to accept solid waste. If the asbestos-containing, asphaltic roofing materials are not handled in accordance with MassDEP Regulation 310 CMR 7.15(10) or if MassDEP has determined that asbestos fibers may be released during handling, removal, or disposal, then the materials shall be disposed in a landfill that has obtained a special waste permit to accept ACWM or is managing such wastes in accordance with 310 CMR 19.061.

3.09 CONSULTANT’S AIR SAMPLING RESPONSIBILITIES

A. Air sampling will be conducted by the Consultant’s Asbestos Project Monitor to determine the effectiveness of the work area controls in preventing asbestos contamination. Independently, the Contractor shall monitor air quality within the work area to comply with OSHA regulations for worker safety.

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B. The Consultant's Asbestos Project Monitor will collect and analyze air samples during the following period:

1. Removal Period: If required or retained for this service, the Consultant's Asbestos Project Monitor will provide continual evaluation of the building air quality during removal, using their best professional judgment in respect to the MADLS guidance level of 0.010 fibers/cc and the background airborne fiber concentration, if established during the pre-abatement period.

   a. If the Consultant's Asbestos Project Monitor determines that the building air quality has become contaminated from the abatement project, they shall immediately inform the Contractor to cease all removal operations, and implement a work stoppage cleanup procedure. The Contractor shall conduct a thorough cleanup of the building areas designated by the Consultant. No further removal work may occur until the Asbestos Project Monitor has determined through air sample collection and analysis that the airborne fiber concentrations are at or below the MADLS re-occupancy standard.

2. Post-Abatement Period: If required, the Consultant's Asbestos Project Monitor will conduct air sampling following the final cleanup phase of the project, once the "no visible, suspect dust or debris" criterion, as established by the Consultant's Asbestos Project Monitor, has been met and the work area has been encapsulated by the Contractor. Final clearance air samples shall be collected in accordance with the MADLS re-occupancy clearance standard.

   a. As required, the Consultant's Asbestos Project Monitor will collect final re-occupancy clearance air samples inside the work area at the completion of abatement work. These final clearance air samples shall be analyzed in accordance with requirements of EPA Title 40 CFR, Part 763, Subpart E and MADLS Regulation 453 CMR 6.00.
   b. Final clearance air sample collection and analysis will be in accordance with MADLS Regulation 453 CMR 6.14(5)(b)(2)(c) and include at least 1 sample for each 500 linear/1,000 square feet of asbestos or portion thereof, or 1 sample per room, whichever is greater. A minimum of 2 samples per clearance will be collected and analyzed. Sample collection and analysis shall be in accordance with NIOSH 7400 Method and include utilizing aggressive air-sampling techniques to obtain a minimum air volume of 1,200 liters.
   c. The Owner shall be responsible for payment for the initial final clearance air sampling performance, only. If the first set of samples fails to satisfy the re-occupancy criteria, the Contractor shall be responsible for payment of all costs associated with the additional final clearance air sampling and analysis.

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d. The Contractor shall properly schedule abatement work and other site activities at appropriate times and locations to prevent cross-contamination and/or dust in areas where the Consultant's Asbestos Project Monitor will conduct air sampling.

3.10 CONSULTANT'S INSPECTION RESPONSIBILITIES

A. The Consultant's Asbestos Project Monitor may conduct inspections throughout the progress of the abatement project. Inspections will be conducted to document the abatement work progress, as well as the Contractor's procedures and practices.

B. The Consultant's Asbestos Project Monitor may perform the following inspections during abatement activities:

1. Pre-Commencement Inspection: If required or retained for this service, pre-commencement inspections shall be performed at the time requested by the Contractor. The Consultant shall be informed 24 hours prior to the time the inspection is needed. If deficiencies are noted during the pre-commencement inspection, the Contractor shall perform the necessary adjustments to obtain compliance.
2. Work Area Inspections: If required or retained for this service, work area inspections shall be conducted on a daily basis, at the discretion of the Consultant. During the work inspections, the Consultant's Asbestos Project Monitor shall observe the Contractor's removal procedures, verify barrier integrity, monitor HEPA-filtered work area ventilation systems, assess project progress, and, if deficiencies are noted, inform the Contractor of specific remedial activities.

C. The Consultant's Asbestos Project Monitor shall perform the following inspections after removal activities are completed:

1. Pre-Sealant Inspection: If required or retained for this service, the Consultant's Asbestos Project Monitor will conduct a pre-sealant inspection, at a time requested by the Contractor. The Consultant shall be informed 24 hours prior the time that the inspection is needed. The pre-sealant inspection shall be conducted after completion of the initial cleaning procedures, but prior to encapsulation. The pre-sealant inspection shall verify that all ACM and residual debris have been removed from the work area. If the Consultant's Asbestos Project Monitor identifies residual dust or debris during the pre-sealant inspection, the Contractor shall re-clean to meet the "no visible, suspect dust or debris" standard.
2. Final Visual Inspection: When abatement is complete, the Consultant's Asbestos Project Monitor will conduct a final visual inspection inside each regulated work area. The Consultant shall be informed 24 hours prior to the time that the inspection is needed. Following the removal of the inner layer of poly sheeting,

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but prior to final clearance air sampling, the Consultant's Asbestos Project Monitor will conduct a final visual inspection inside the work area. If residual dust or debris is identified during the final inspection, the Contractor shall re-clean to meet the "no visible, suspect dust or debris" standard.

3.11 ASBESTOS DISPOSAL

A. ACM and/or ACWM disposal (including supplies, rags, disposable clothing, respirator filter cartridges, etc.) shall be completed in accordance with MassDEP and EPA regulations. Waste receptacles (bags, drums, etc.) shall be labeled in accordance with the most current OSHA regulations (Title 29 CFR, Parts 1910.1001 and 1926.1101) and contain the following:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

B. Disposal site approvals shall be obtained and accepted prior to the start of asbestos removal activities.

C. A copy of the signed disposal authorization shall be provided to the Owner, Consultant, and any required federal, state, or local agencies.

D. Copies of all Waste Shipment Records (WSR) shall be provided to the Owner no later than 35 calendar days from when the waste was removed from the Site for inclusion in the project file. The Contractor shall document the specific amount of waste on each WSR, portion/location of the Site building it was generated from, and the type of waste. Upon receipt of the ACM waste, the landfill operator shall sign the WSR so the quantity of asbestos debris leaving the Site and arriving at the landfill is documented for the Owner.

E. All wash water and shower water shall be collected and filtered through a five-micron filter before discharge to a sanitary sewer with prior appropriate permitting or publicly-owned treatment works (POTW) approval. Alternately, wash and shower water can be used to moisten ACWM.

F. All ACWM 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 Commonwealth of Massachusetts and United State Department of Transportation (DOT) requirements.

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G. Any vehicles used to store or transport ACWM will either be removed from the Site at night, or securely locked and posted to prevent disturbance.

H. Any incident and/or accident that may result in spilling or exposure of ACWM outside the containment, on and off the property, and all related issues shall be the sole responsibility of the Contractor.

END OF SECTION

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SECTION 02 83 10

LEAD-BASED PAINT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. General Provisions of Contract, including General Supplementary Conditions shall apply to this Section.

B. Limited Hazardous Building Materials Inspection Report prepared by Fuss & O'Neill EnviroScience, LLC (October 27, 2015).

C. Section 02 41 00 - Demolition.

D. Section 02 82 13 - Asbestos Abatement.

E. Architectural Demolition Drawings (AD1-03, AD2-01, AD2-02, & AD2-03) prepared by CBI Consulting, Inc.

1.02 SUMMARY OF WORK

A. Work of this Section includes requirements for worker protection and waste disposal related to demolition involving lead-based paint (LBP)-coated building components and surfaces (the "Work) at the Barnstable Community Horace Mann Charter Public School located at 165 Bearses Way in Hyannis, Massachusetts (the "Site").

B. The Site is considered a "Child Occupied Facility" and therefore all Work shall be conducted as Lead-Safe Renovation by licensed Contractors in accordance with 454 CMR, Part 22.03(3) or by licensed de-leading contractors in accordance with 22.03(1) hereinafter referred to as Lead-Safe Renovation Contractors. As noted, the Work is not a de-leading project in accordance with 105 CMR, Part 460.000.

C. Lead Safe Work Practices: Exposure levels for lead in the construction industry are regulated by the Occupational Safety and Health Administration (OSHA) Title 29 CFR, Part 1926.62. Additionally, the Commonwealth of Massachusetts Department of Labor Standards (MADLS) Regulation 453 CMR, Part 22.00 for Renovation and "Lead Safe Renovation" shall apply to this "Child Occupied Facility". Note the project is not being performed as a de-leading project pursuant to Commonwealth of Massachusetts Department of Public Health Regulations. Construction activities disturbing surfaces with lead-containing paint that are likely to be employed, such as demolition, sanding, grinding, welding, cutting and burning, have been known to expose workers to levels of lead in excess of the OSHA Permissible Exposure Limit (PEL). All work specified in the Contract Documents shall also be in conformance with this Section.

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D. The procedures referenced herein shall be utilized during required demolition work, specified elsewhere, that may impact building components coated with LBP. The following painted components were determined to be coated with LBP:

1. Barnstable Community Horace Mann Charter Public School

   a. Wood Fascia/Soffits;
   b. Metal Louvers at Exterior & Roof;
   c. Wood Cupola;
   d. Metal Flashing at Cupola; and
   e. Metal (Exterior) Lintels.

E. Work impacting LBP-coated components may result in dust and debris exposing workers to levels of lead above the Occupational Safety and Health Administration's (OSHA) Action Level. Worker protection, training, and engineering controls referenced herein shall be strictly followed, until completion of exposure assessment with results indicating exposures below the "Action Level". This Section does not involve lead abatement, but identified worker protection requirements for trades involved in the demolition and disposal procedures if LBP is involved in the demolition waste stream.

F. Responsibilities of Lead-Safe Renovation Contractors: The responsible party of the Lead-Safe Renovation Contractor or other entity conducting renovation work shall ensure the following:

1. All persons performing renovation work are responsible persons or employees of the Lead-Safe Renovation Contractors.
2. A person who is Certified as a Lead-Safe Renovator Supervisor or a licensed De-leader Supervisor hereinafter referred to as Supervisor shall be assigned to the project for each contractor performing renovation work where lead paint is to be disturbed and be on site at all times during Lead-Safe Renovation Work.
3. All workers performing Lead-Safe Renovation shall be Certified as Lead-Safe Renovator Supervisors or have received requisite training in accordance with 454 CMR, Part 22.08(4)(i).
4. Prior to the start of work the Lead-Safe Renovation Contractor shall ensure pre-renovation notification requirements for providing EPA Pamphlet are adhered to.
5. The Lead Safe Renovation Contractor and Supervisor shall ensure that lead safe work practice requirements are utilized in accordance with 454 CMR, Part 22.11(9).
6. The required record keeping documentation of the Lead-Safe Renovation work shall be maintained as required in accordance with 454 CMR, Part 22.13(2).

G. Responsibilities of Lead-Safe Renovation Supervisors: The responsible party of the Lead-Safe Renovation Contractor shall ensure the following:

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1. The Supervisor shall be assigned to the project for each contractor performing renovation work where lead paint is to be disturbed and be on site at all times during Lead-Safe Renovation Work.
2. The Lead Safe Renovation Supervisor shall oversee and ensure that lead safe work practice requirements are utilized in accordance with 454 CMR, Part 22.11(9) and provide on-the job training for workers in the work practices to be utilized in the performance of their work tasks.
3. In the absence of testing of painted surfaces to be disturbed by a licensed Lead Inspector or Risk Assessor, use a EPA recognized test kit to determine the presence or absence of lead on surfaces and components to be affected or disturbed during the Renovation Work or assume surfaces contain lead and utilized work practices.
4. Upon the completion of work conduct the required visual clearance inspection and cleaning verification as required by 454 CMR, Part 22.11(9)(h).

H. Waste characterization has not been performed due to the allowance for exemption of materials such as scrap metal which are to be recycled or salvaged. Anticipated waste handling shall include the following:

1. All metal waste shall be recycled as scrap metal in accordance with exemptions.
2. Wood debris coated with LBP shall require testing by TCLP to determine disposal requirements by the Contractor. Waste shall be included for disposal as presumed hazardous lead waste for bidding purposes. If TCLP results identify waste as non-hazardous, Contractor shall be requested to provide a credit for disposal as hazardous to the Owner.
3. All paint debris from surface preparations, paint removal, coring, drilling, cutting, sanding, etc. shall be considered hazardous lead waste and properly disposed by Contractor generating such waste through their operations.

1.03 DEFINITIONS

A. The following definitions relative to LBP shall apply:

1. Action Level (AL): The allowable employee exposure, without regard to use of respiratory protection, to an airborne concentration of lead over an eight (8)-hour time-weighted average (TWA) as defined by OSHA. The current action level is thirty micrograms per cubic meter (30 $\mu g/m^3$) of air.
2. Architect: CBI Consulting, Inc.
3. Area Monitoring: The sampling of lead concentrations, which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
4. Biological Monitoring: The analysis of a person's blood and/or urine, to determine the level of lead concentration in the body.
5. CDC: The Center for Disease Control.

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6. Certification: The authorization to act as a Lead-Safe Renovator Supervisor on renovation projects, which is conferred by MADLS to persons who have successfully completed the initial training and refresher training for Lead-Safe Renovation Supervisors.
7. Change Room: An area provided with separate facilities for clean protective work clothing and equipment and for street clothes, which prevents cross-contamination.
8. Child-Occupied Facility: A building, or a portion of a building, constructed prior to 1978, and visited by the same child of less than six years of age on at least two different days within any week (Sunday through Saturday), provided that each day's visit lasts at least three hours and the combined weekly visits last at least six hours, and the combined annual visits last at least 60 hours. Child-Occupied Facilities may be located in target housing or in public or commercial buildings. With respect to common areas in public or commercial buildings that contain Child-Occupied Facilities, the Child-Occupied Facility encompasses only the exterior sides of the building that are immediately adjacent to the Child-Occupied Facility.
9. Cleaning Verification Card: A card developed and distributed, or otherwise approved by EPA for the purpose of determining, through comparison of wet and dry disposable cleaning cloths with the card, whether post-renovation cleaning has been adequately completed.
10. Competent Person: A person employed by the Contractor who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA.
11. Consultant: Fuss & O'Neill EnviroScience, LLC.
12. EPA: The United States Environmental Protection Agency.
13. Exposure Assessment: An assessment conducted by an employer to determine if any employee may be exposed to lead at or above the AL.
14. High-Efficiency Particulate Air (HEPA): A type of filtering system capable of filtering out particles of 0.3 microns diameter from a body of air at 99.97% efficiency or greater.
15. HUD: The United States Housing and Urban Development.
16. Lead: Refers to metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.
17. Lead Work Area: An area enclosed in a manner to prevent the spread of lead dust, paint chips, or debris resulting from LBP disturbance.
18. Lead-Based Paint: Refers to paints, glazes, and other surface coverings containing a toxic level of lead.
19. Minor Repair And Maintenance Activities: Renovation, repair and painting activities that disrupt six square feet or less of painted surfaces per room for interior work or 20 square feet or less of painted surface for exterior work where none of the work practices prohibited by 454 CMR, Part 22.11(9)(a) are used and where the work does not involve window replacement or demolition of painted surfaces.
20. MSHA: The Mine Safety and Health Administration.
21. NARI: The National Association of the Remodeling Industry.
22. NIOSH: The National Institute of Occupational Safety and Health.

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23. OSHA: The Occupational Safety and Health Administration.
24. Permissible Exposure Limit (PEL): The maximum allowable limit of exposure to an airborne concentration over an 8-hour TWA, as defined by OSHA. The current PEL for lead is fifty (50) $\mu g/m^3$ of air. Extended workdays lower the PEL by the formula: PEL equals 400 divided by the number of hours of work.
25. Personal Monitoring: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour TWA concentration in accordance with OSHA Title 29 CFR, Parts 1910.1025 and 1926.62. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a sphere with a radius of eighteen (18) inches and centered at the nose or mouth of an employee.
26. Recognized Test Kit: A commercially available kit recognized by EPA pursuant to Title 40 CFR, Part 745.88 as being capable of determining the presence of lead at regulated concentrations in a paint chip, paint powder, or painted surface.
27. Renovation Project or Work: The renovation, repair, or painting of target housing or Child-Occupied Facility, or portion thereof, which results in or may result in the disturbance of LBP or LBP debris.
28. Resource Conservation and Recovery Act (RCRA): RCRA establishes regulatory levels of hazardous chemicals. There are 8 heavy metals of concern for disposal: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Six (6) of the metals are typically in paints, excluding selenium and silver.
29. Responsible Person(S): A person or persons having management control over an entity or employer. In the case of a corporation, the responsible person(s) shall be the officers of the corporation and any other managing agent of such corporation. In the case of a sole proprietorship or a partnership, the responsible person(s) shall be the owners or partners and any other managing agent of such sole proprietorship or partnership. In the case of a limited liability company the responsible person(s) shall be the members and managers, if any, of such company.
30. SDS: Safety Data Sheets.
31. Site: The Barnstable Community Horace Mann Charter Public School.
32. Target Housing: Any housing constructed prior to 1978, except housing for the elderly or persons with disabilities (unless a child under the age of six resides or is expected to reside in such housing) and any zero-bedroom dwelling.
33. Toxic Level of Lead: A level of lead, when present in dried paint or plaster, contains more than 0.50% lead by dry weight as measured by atomic absorption spectrophotometry (AAS) or 1.0 milligram per square centimeter (mg/cm^2) as measured by on-site testing utilizing an x-ray fluorescence analyzer.
34. Toxicity Characteristic Leaching Procedure (TCLP): The EPA required sample preparation and analysis method for determining the hazard characteristics of a waste material. Waste must be disposed as Hazardous Waste if a TCLP analytical result indicates leaching greater than or equal to five milligrams per liter ($\geq$ 5.0 mg/L).
35. TWA: Time-Weighted Average.

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1.04 REGULATIONS AND STANDARDS

A. All applicable regulations, standards, and ordinances of federal, state, and local agencies are applicable and made a part of this Section. This includes, but is not limited to, the following:

1. American National Standards Institute (ANSI)

   a. ANSI 288.2 - 1980 Respiratory Protection

2. Code of Federal Regulation (CFR)

   a. Title 29 CFR, Part 1910.134 - Respiratory Protection
   b. Title 29 CFR, Part 1910.1025 - Lead
   c. Title 29 CFR, Part 1910.1200 - Hazard Communication
   d. Title 29 CFR, Part 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists
   e. Title 29 CFR, Part 1926.57 - Ventilation
   f. Title 29 CFR, Part 1926.59 - Hazard Communication in Construction
   g. Title 29 CFR, Part 1926.62 - Lead in Construction Interim Final Rule
   h. Title 40 CFR, Parts 124 and 270 - Hazardous Waste Permits
   i. Title 40 CFR, Part 172 - Hazardous Materials Tables and Communication Regulations
   j. Title 40 CFR, Part 178 - Shipping Container Specifications
   k. Title 40 CFR, Part 260 - Hazardous Waste Management Systems: General
   l. Title 40 CFR, Part 261 - Identification and Listing of Hazardous Waste
   m. Title 40 CFR, Part 262 - Generators of Hazardous Waste
   n. Title 40 CFR, Part 263 - Transporters of Hazardous Waste
   o. Title 40 CFR, Part 264 - Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
   p. Title 40 CFR, Part 265 - Interim Statutes for Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
   q. Title 40 CFR, Part 268 - Lead Disposal Restrictions
   r. Title 49 CFR, Parts 170 - 180 Hazardous Wastes

3. Underwriters Laboratories, Inc. (UL)

   a. UL586 - 1990 High Efficiency Particulate Air Filter Units

1.05 QUALITY ASSURANCE

A. Hazard Communication Program

1. The Contractor shall establish and implement a Hazard Communication Program as required by OSHA Title 29 CFR, Part 1926.59.

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B. Compliance Plan (Site-Specific)

1. The Contractor shall establish a written compliance plan, which is specific to the Site, to include the following:

   a. A description of work activity involving LBP disturbance including equipment used, material included, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.
   b. Engineering controls used to control lead exposure.
   c. The proposed technology the Contractor will implement in meeting the PEL.
   d. Air monitoring data documenting the source of lead emissions.
   e. A detailed schedule for implementing the program, including documentation of appropriate supply of equipment, etc.
   f. Proposed work practice which establishes proper protective work clothing, housekeeping methods, hygiene facilities, and practices.
   g. Worker rotation schedule (if proposed), to reduce TWA.
   h. A description of methods for informing workers of potential lead exposure.

C. Hazardous Waste Management

1. The Contractor shall establish a Hazardous Waste Management Plan, which shall comply with applicable regulations and address the following:

   a. Hazardous waste identification.
   b. Estimated waste disposal quantity.
   c. Names and qualifications of each subcontractor who will be transporting, storing, treating, and disposing wastes.
   d. Disposal facility location and 24-hour point of contact.
   e. Establish EPA state hazardous waste and identification numbers, if applicable.
   f. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
   g. List of waste handling equipment to be used in performing the work to include cleaning, volume reduction, if applicable, and transport equipment.
   h. Qualifications of laboratory to be utilized for TCLP sampling and analysis, if applicable.
   i. Spill Prevention, Control, and Countermeasure (SPCC) Plan.
   j. Work plan and schedule for waste containment, removal, treatment, and disposal.

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D. Medical Examinations

1. Before exposure to lead-contaminated dust, provide workers with a comprehensive medical examination as required by OSHA Title 29 CFR, Parts 1910.1025 and 1926.62.
2. The examination shall not be required if adequate records show that employees have been examined as required by OSHA Title 29 CFR, Part 1926.62 within the last year.
3. Medical examination shall include, at a minimum, biological monitoring and approval to wear respiratory protection.

E. Training

1. The Contractor shall ensure that workers are trained to perform LBP disturbing activities and disposal operations prior to the start of work, in accordance with OSHA Tile 29 CFR, Part 1926.62.

F. Respiratory Protection Program

1. The Contractor shall furnish each employee required to wear a negative pressure respirator with a respirator fit test at the time of initial fitting and at least once every 6 months thereafter, as required by OSHA Title 29 CFR, Part 1926.62.
2. The Contractor shall establish a Respiratory Protection Program in accordance with ANSI Z88.2 and OSHA Title 29 CFR, Parts 1910.134 and 1926.62.

1.06 SUBMITTALS

A. The Contractor shall submit the following to the Consultant, in one complete package, prior to the pre-construction meeting and at least ten (10) business days before the start of the Work:

1. Copies of medical records for each employee to be used on the project, including results of biological monitoring and a notarized statement by the examining physician that such an examination took place.
2. Copies of Lead-Safe Renovator’s Contractor License and Certifications of Lead-Safe Renovator Supervisor training certificates.
3. Submit record of successful respirator fit testing performed by a qualified individual within the previous six (6) months, for each employee to be used on this project with the employee's name and social security number with each record.
4. The name and address of Contractor's blood lead testing lab, OSHA-CDC listing, and Certification in the Commonwealth of Massachusetts.
5. The name and address of Contractor's personal air monitoring and waste disposal lead testing laboratory/ies.
6. Name, address, and ID number of the hazardous waste hauler, waste transfer route, and proposed disposal site.

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No work on the Site will be allowed to begin until the Owner and the Consultant, as listed herein, accept the Pre-Construction Submittals. Any delay caused by the Contractor's refusal or inability to submit this documentation accurately, completely, and in a timely manner does not constitute a cause for change order or a time extension.

B. The following shall be submitted to the Consultant during the Work:

1. Personal air sampling results.
2. Training and medical records for new employees to start Site work (24-hours in advance).

C. The following shall be submitted to the Consultant at the completion of the Work:

1. Copies of all air sampling results.
2. Contractor logs.
3. Copies of manifests and receipts acknowledging disposal of all waste material from the project showing delivery date, quantity, and appropriate signature of authorized landfill representative.

1.07 PERSONAL PROTECTION

A. Exposure Assessment

1. The Contractor shall determine if any worker will be exposed to lead at or above the AL.
2. The exposure assessment shall identify the level of exposure a worker would be subjected to without respiratory protection.
3. The exposure assessment shall be achieved by obtaining personal air monitoring samples representative of a full shift, at least an 8-hour TWA.
4. During the period of the exposure assessment, the Contractor shall institute the following procedures for worker protection:
    a. Protective clothing shall be utilized
    b. Respiratory protection
    c. Change areas shall be provided
    d. Hand washing facilities and shower shall be provided
    e. Biological monitoring
    f. Worker training

B. Respiratory Protection

1. The Contractor shall furnish appropriate NIOSH/MSHA-approved respirators for use in atmospheres containing lead dust.
2. Respirators shall comply with the requirements of OSHA Title 29 CFR, Part 1926.62.
3. Workers shall be instructed in all aspects of respiratory protection.

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4. The Contractor shall have an adequate supply of HEPA-filter cartridges and spare parts on-site for all types of respirators in use.
5. The following minimum respirator protection for use during paint removal or demolition of components and surfaces with LBP shall be the half-face, air-purifying respirator with a minimum of dual P100 filter cartridges (for exposures not in excess of 500 µg/m^3 or 10 x PEL).

C. Protective Clothing

1. Personal protective clothing shall be provided for all workers, supervisors, and authorized visitors entering the work area.
2. Each worker shall be provided daily with a minimum of two (2) complete disposable coverall suits.
3. Removal workers shall not be limited to 2 coveralls, and the Contractor shall supply additional coveralls as necessary.
4. Under no circumstances shall anyone entering the abatement area be allowed to re-use a contaminated disposable suit.
5. Disposable suits (Tyvek™ or equivalent) and other personal protective equipment (PPE) shall be donned prior to entering a lead work area. A change room shall be provided for workers to don suits and other PPE with separate areas to store street clothes and personal belongings.
6. Eye protection for personnel engaged in lead operations shall be furnished when the use of a full-face respirator is not required.
7. Goggles with side shields shall be worn when working with power tools, a material that may splash or fragment, or if protective eye wear is specified on the SDS for a particular product to be used on the project.

1.08 PERSONAL MONITORING

A. General

1. The Contractor shall be required to perform the personal air sampling activities during LBP disturbing work. The results of such air sampling shall be posted, provided to individual workers, and submitted to the Client, as described herein.

B. Air Sampling

1. Air samples shall be collected for the duration of the work shift or for 8 hours, whichever is less. If working conditions remain unchanged, personal air samples need not be collected every day after the first day; however, they must be collected each time there is a change in removal operations, either in terms of the location, or in the type of work. Sampling will be used to determine the 8-hour TWA. The Contractor shall be responsible for personal air sampling as outlined in OSHA Title 29 CFR, Parts 1910.1025 and 1926.62.

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2. Air sampling results shall be reported to individual workers, in written form, no more than 48 hours after the completion of a sampling cycle. The reporting document shall list each sample's result, sampling time and date, personnel monitored and their social security numbers, flow rate, sample duration, sample yield, cassette size, and analyst's name and company, and shall include an interpretation of the results. Air sample analysis results will be reported in $\mu g/m^3$.

C. Testing Laboratory

1. The Contractor's testing lab shall be currently participating in AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP). The Contractor shall submit to the Consultant for review and acceptance, the name and address of the laboratory, certification(s) of AIHA participation, a listing of relevant experience in air lead analysis, and presentation of a documented Quality Assurance and Quality Control Program.

PART 2 - PRODUCTS

2.01 GENERAL

A. Any substitution in materials, equipment, or methods to those specified shall be approved by the Owner and Consultant prior to use. Any requests for substitution shall be provided in writing to the Owner and Consultant. The request shall clearly state the rationale for the substitution.

B. Submit to the Owner and Consultant product data for all materials and equipment and material samples to be considered as an alternate.

C. Product data shall consist of manufacturer catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, SDS, and other standard descriptive data. Submittal data shall be clearly marked to identify pertinent materials, products, or equipment and show performance characteristics and capacities.

D. Samples shall be of sufficient size and quantity to clearly illustrate the functional characteristics of the product or material with integrally related parts and attachment devices.

2.02 MATERIALS AND PRODUCTS

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.

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C. The Contractor shall have a sufficient inventory of, or dated purchase orders for, materials necessary for the work (e.g., protective clothing, respirators, respirator filter cartridges, polyethylene (poly) sheeting of proper size and thickness, tape, spray adhesive, air filters, etc.).

D. Materials

1. Poly sheeting in a roll size to minimize the frequency of joints shall be delivered to the Site with factory label indicating 6-mil.
2. Poly disposable bags shall be 6-mil. Tie wraps for bags shall be plastic, five (5)-inches long (minimum), pointed and looped to secure filled poly bags.
3. Tape or spray adhesive will be capable of sealing joints in adjacent poly sheets and for attachment of poly sheeting to finished or unfinished surfaces of dissimilar materials and capable of adhering onto both dry and wet conditions, including use of amended water.
4. Impermeable containers are to be used to receive and retain any lead-containing or lead-contaminated materials until disposal at an acceptable disposal site. The containers shall be labeled in accordance with EPA and DOT standards.
5. HEPA-filtered exhaust systems shall be used during powered dust-generating removal operations. Using powered equipment without HEPA exhaust systems in-place on this Site is prohibited.

2.03 TOOLS AND EQUIPMENT

A. Provide suitable tools for all LBP disturbing operations.

B. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and/or electrical power sources (e.g., generators, etc.). Any electrical-connection work affecting the building electrical power system shall be performed by a Commonwealth of Massachusetts-licensed electrician, permitted as required.

C. HEPA-Vacuum Equipment, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. At least one week prior to the start of work, a Pre-Construction Meeting will be scheduled and must be attended by the Contractor and any Subcontractors. The assigned Contractor Site Supervisor must attend this meeting.

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B. The Contractor shall present a detailed project schedule and project submittal package at the Pre-Construction Meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and Consultant will inform the Contractor of any scheduling adjustments for this project.

C. Following the Pre-Construction Meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.02 WORKER PROTECTION/TRAINING

A. The Contractor shall provide appropriate training, PPE, and biological monitoring for each worker and ensure proper usage during potential lead exposure and the initial exposure assessment.

3.03 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor shall be responsible for establishing and maintaining controls referenced herein to prevent lead contamination outside the lead work area.

B. The Contractor shall also be responsible for conducting work with applicable federal, state, and local regulations as referenced herein.

3.04 WORKER HYGIENE PRACTICES (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA AL)

A. Work Area Entry

1. Workers shall don PPE, including respiratory protection, disposable coveralls, gloves, headgear, and footwear, prior to entering the work area.

B. Work Area Departure

1. While leaving respirators on, workers shall remove all gross contamination, debris, and dust from disposable coveralls and proceed to change room to remove coveralls and footwear and place in hazardous waste disposal container.

C. Hand-Washing Facilities

1. All workers must wash their hands and faces upon leaving the work area.

D. Equipment

1. All equipment used by workers inside the work area shall be wet-wiped or bagged for future decontamination before removal from the work area.

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E. Prohibited Activities

1. Under no circumstances shall workers eat, drink, smoke, chew gum or tobacco, apply cosmetics, or remove their respirators in the work area.

F. Shock Hazards

1. The Contractor shall be responsible for using safe procedures to avoid electrical hazards. All temporary electrical wiring will be protected by ground-fault circuit interrupters (GFCI).

3.05 LEAD WORK AREA (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA AL)

A. The Contractor shall place lead warning signs at all entrances and exits from the work area. Signage shall be a minimum of 20" x 14" and shall state the following:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING OR DRINKING
UNAUTHORIZED ENTRY PROHIBITED

B. The Contractor shall designate a change room as specified in this Section. The change room shall consist of 2 layers of 6-mil poly sheeting on the floor surface adjacent to the lead work area. The change room shall have separate storage facilities for street clothes to avoid cross-contamination.

C. The Contractor shall provide potable water for hand and face washing.

D. The Contractor shall place 6-mil poly sheeting on floor/ground surfaces prior to beginning removal work to facilitate clean-up.

E. Requirements for Exterior Renovations: The following minimum work practices shall be utilized during Renovation Work to ensure proper protection of areas outside of the Work Area do not become contaminated by the Renovation Work, to facilitate post cleaning and to protect existing property.

1. Where renovation work involves the disturbance of lead paint, lead painted structures or lead paint debris on the side of a building, all doors and windows within a horizontal distance of 20 feet from the area where the work is taking place, on the same floor, and all floors below, shall be closed for the duration of the work.
2. The ground and any plants or shrubs in the area shall be covered with a tarpaulin, plastic sheeting or other appropriate impermeable material. The covering shall

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extend 10 feet from the surfaces to be disturbed or a sufficient distance to collect any and all falling paint debris whichever is greater.

3. Exterior renovation work shall be conducted in a manner to confine any generated lead dust or debris to the Work Area, and in no circumstances shall the migration of lead dust or debris be permitted to an abutting property.
4. Paint chips or other materials containing lead during work operations shall not be allowed to fall distances in excess of 40 feet without the use of a dust-tight chute or enclosure.

3.06 WORK AREA CLEAN-UP

A. The Contractor shall remove all loose chips and debris from floor/ground surfaces and place in hazardous waste disposal bags including all interior and exterior surfaces which may have become contaminated with lead dust or debris

B. The Contractor shall HEPA vacuum adjacent surfaces to remove dust and debris and clean with wet wiping or washing with solutions of tri-sodium phosphate or household detergent.

C. Polyethylene sheeting and other barriers utilized to separate the Work Area from non-Work Areas shall remain in place until thorough cleaning and verification has been performed.

D. The Lead-Safe Renovator Supervisor shall perform post cleaning visual inspection and for interior areas which may have been contaminated by the work comparison to Post-Cleaning Verification Card and ensure all surfaces meet clearance.

3.07 WASTE DISPOSAL

A. The Contractor’s contractual liability shall be the proper disposal of all wastes generated at the Site in accordance with all applicable federal, state, and local regulations as referenced herein.

1. The Contractor shall be responsible for collecting a waste characterization sample for TCLP analysis, as is required by the designated disposal site. Results of the TCLP analysis shall be forwarded by the Contractor to the Consultant prior to the waste being transported off-Site.

3.08 CONSULTANT

A. The Owner may retain a Consultant for the purpose of construction administration and project monitoring during demolition work at the Site.

B. The Consultant will represent the Owner in all tasks of the project at the discretion of the Owner.

END OF SECTION

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SECTION 028433

POLYCHLORINATED BIPHENYL PERFORMANCE-BASED DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. General Provisions of Contract, including General Supplementary Conditions shall apply to this Section.

B. Limited Hazardous Building Materials Inspection Report prepared by Fuss & O'Neill EnviroScience, LLC (October 27, 2015).

C. Section 024100 - Demolition.

D. Section 028213 - Asbestos Abatement.

E. Architectural Demolition Drawings prepared by CBI Consulting, Inc.

1.02 SCOPE OF WORK

A. Work outlined in this Section includes all work necessary for the removal and disposal of the presumed greater than or equal to (≥) 50 parts per million (ppm) PCB-containing material (i.e., PCB Bulk Product Waste) impacted during the roof replacement (the "Work") to occur at the Barnstable Community Horace Mann Charter Public School located at 165 Bearses Way in Hyannis, Massachusetts (the "Site").

B. The Work of this Section includes the following:

1. Site preparation and controls to facilitate performance-based disposal of PCB Bulk Product Waste. Containment procedures for materials referenced for the PCB Work Zone must be utilized for PCB Bulk Product Waste removal.
2. Health and Safety in accordance with Occupational Safety and Health Administration (OSHA) requirements.
3. Removal, packaging, transportation, and disposal of presumed PCB-containing materials as PCB Bulk Product Waste at a facility permitted to accept PCB Bulk Product Waste (EPA Title 40 CFR, Part 761.62).
4. Removal, packaging, transportation, and disposal of containment barriers, personal protective equipment (PPE), cleaning materials and supplies, and waste generated during removal of PCB Bulk Product Waste as PCB Remediation Waste at a facility permitted to accept PCB Remediation Waste.
5. Cleaning of the Work Zones following complete removal of PCB Bulk Product Waste and PCB Remediation Waste (EPA Title 40 CFR, Part 761.61).

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6. Recordkeeping and distribution as required in accordance with EPA Title 40 CFR, Part 761.

C. Work shall be performed by a MADLS-licensed Asbestos Abatement Contractor (the "Contractor") with certified Asbestos Workers and Supervisor(s). Training shall be in accordance with MADLS Regulation 453 CMR, Part 6.00. Alternately, work involving the removal of non-friable, asphaltic roofing may be performed by workers with (minimum) 8-hour asbestos-awareness training specific to Category I non-friable, asbestos-containing, asphaltic roofing removal. In addition, workers shall have PCB-awareness training.

1.03 PROJECT DESCRIPTION

A. The Base Bid includes the removal, packaging, transporting, and disposing the presumed PCB Bulk Product Waste and PCB Remediation Waste, as identified herein, conducted by workers in accordance with OSHA and EPA regulations. The Base Bid will include the cost for removing, packaging, transporting, and disposing PCB Bulk Product Waste and PCB Remediation Waste.

B. Materials, as discovered outside of those listed (either above or below), will be measured and paid or credited by unit prices. The quantities are estimates only and should be verified by the Contractor.

C. The following table summarizes the locations of the base bid work with estimated material quantities. Note quantities provided below are order-of-magnitude estimates only. Refer to Demolition Drawings for specific locations.

BASE BID - PCB BULK PRODUCT WASTE

MATERIAL TYPE	LOCATION	QUANTITY	NOTES
Barnstable Community Horace Mann Charter Public School			
Flashing-Fastener Sealants	Roofs	500 SF	1, 2

SF = Square Feet

Notes:

1. Denotes material type contains asbestos.
2. Includes removal and disposal of impacted/contaminated flashing material and built-up curbing down to existing deck and/or masonry wall as ACWM.

D. A portion of the Work may be performed in multiple mobilizations, at different periods of time, in conjunction with other trades (i.e., other trades work, demolition work, etc.).

E. Safety Data Sheets (SDS) for chemicals to be used during the project must be submitted to the Consultant prior to Site delivery.

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F. The Contractor shall be responsible for providing temporary water, power, and heat as needed at the Site. Temporary lighting within the Work Zones must be connected to Ground-Fault Circuit Interrupter (GFCI) power panels, installed by a Commonwealth of Massachusetts-licensed electrician, permitted as required, and located outside of the Work Zone.

1.04 DEFINITIONS

A. The following definitions relative to PCB removal and disposal shall apply:

1. Architect: CBI Consulting, Inc.
2. Air Monitoring: The process of measuring PCB concentrations of an area or exposure of a person.
3. CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act (Title 42 CFR, Parts 9601-9657).
4. Chemical Waste Landfill: A landfill at which protection against risk of injury to health or the environment from PCB migration to land, water, or the atmosphere is provided from PCBs and PCB items deposited therein by locating, engineering, and operating the landfill as specified in EPA Title 40 CFR, Part 761.75.
5. Cleanup Site: The full contamination extent and all suitable areas in very close proximity to the contamination necessary for implementation of a PCB Remediation Waste cleanup, regardless of whether the Site was intended for management of waste.
6. Competent Person: As defined by OSHA, a representative of the Contractor who is capable of identifying existing PCBs hazards in the workplace and selecting the appropriate control strategy for PCB exposure. Person who has authority to take prompt corrective measures to eliminate such hazards during PCB removal.
7. Consultant: Fuss & O'Neill EnviroScience, LLC
8. Containment: An enclosure which establishes a contaminated area by surrounding the location where PCB and/or other toxic or hazardous substance removal is performed and establishing a Controlled Work Zone.
9. Decontamination Enclosure System (Decon): A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
10. Designated Facility: An off-site disposer or commercial storer of PCB-containing waste designated on the manifest as the facility that will receive a manifested shipment of PCB-containing waste.
11. Disposal: An intentional or accidental act of discarding, throwing away, completing, or terminating the useful life of PCBs and PCB-containing items. Disposal includes spills, leaks, and other uncontrolled discharges of PCBs, as well as actions related to containing, transporting, destroying, degrading, decontaminating, or confining PCBs and PCB items.
12. DOT: The United States Department of Transportation.
13. EPA Identification Number: The 12-digit number assigned to a facility by EPA upon notification of PCB waste activity under EPA Title 40 CFR, Part 761.205.

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14. Excluded PCB Product: A PCB-containing material which is determined by laboratory analysis to contain concentrations of PCBs less than 50 ppm, and meets the requirements of EPA Title 40 CFR, Part 761.3.
15. Fixed Object: Mechanical equipment, electrical equipment, fire detection systems, alarms, or all other fixed equipment, fixtures, or items which cannot be removed from the Work Zone.
16. Generator of PCB Waste: Any person who acts, processes, or produces PCBs that are regulated for disposal under EPA Title 40 CFR, Part 761, Subpart D, whose act first causes PCBs or PCB-containing items to become subject to the disposal requirements of EPA Title 40 CFR, Part 761, Subpart D, or who has physical control over the PCBs when a decision is made that the use of the PCBs has been terminated, and is therefore subject to the disposal requirements of EPA Title 40 CFR, Part 761, Subpart D. Unless another provision of EPA Title 40 CFR, Part 761 specifically requires a site-specific meaning, "Generator of PCB Waste" includes all of the PCB waste generation sites owned or operated by the person who generates PCB waste.
17. GFCI: Ground-Fault Circuit Interrupter.
18. HEPA: High-Efficiency Particulate Air.
19. HEPA Filter: Filter in compliance with ANSI Z9.2 1979.
20. HEPA Vacuum Equipment: Vacuum equipment where all the air drawn into the machine is expelled through a HEPA filter with none of the air leaking past it and with a HEPA-filter as the last filtration stage.
21. High-Occupancy Area: Any area where PCB Remediation Waste has been disposed on-site and where occupancy for any individual not wearing dermal and respiratory protection for a calendar year is: 840 hours or more (an average of 16.8 hours or more per week) for non-porous surfaces and 335 hours or more (an average of 6.7 hours or more per week). Examples might include a residence, school, day care center, sleeping quarters, a single or multiple occupancy, 40-hours per week work station, a school classroom, a cafeteria in an industrial facility, a control room, or a work station at an assembly line.
22. Incinerator: An engineered device using controlled flame combustion to thermally degrade PCBs and PCB Items. Examples of devices used for incineration include rotary kilns, liquid-injection incinerators, cement kilns, and high-temperature boilers.
23. Laboratory: A facility that analyzes samples for PCBs and is unaffiliated with any entity whose activities involve PCBs.
24. Large PCB Mark (PCB M_L): Mark that includes letters and striping on a white or yellow background, and shall be sufficiently durable to equal or exceed the life (including storage for disposal) of the PCB Article, PCB Equipment, or PCB Container. The size of the mark shall be at least six inches (6") on each side. If the PCB Article or PCB Equipment is too small to accommodate this size, the mark may be reduced in size proportionately down to a minimum of two inches (2") on each side.
25. Liquid PCBs: A homogenous, flowable material containing PCBs, and no more than 0.5 percent by weight of non-dissolved material.
26. Low-Occupancy Area: Any area where PCB Remediation Waste has been disposed on-site, and where occupancy for any individual not wearing dermal and respiratory

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protection for a calendar year is: less than 840 hours (an average of 16.8 hours per week) for non-porous surfaces and less than 335 hours (an average of 6.7 hours per week). Examples might include an electrical substation or a location in an industrial facility where a worker spends small amounts of time per week (such as an un-occupied area outside a building, an electrical equipment vault, or in the non-office space in a warehouse where occupancy is transitory).

27. Manifest: The shipping document EPA form 8700-22, and any continuation sheet attached to EPA form 8700-22, originated and signed by the Generator of PCB Waste.
28. Mark: The descriptive name, instructions, cautions, or other information applied to PCBs, PCB Items, or other objects.
29. Marked: The marking of PCB Items, PCB storage areas, and transport vehicles by means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the requirements of the EPA Title 40 CFR, Part 761.
30. Movable Object: Unit of equipment of furniture in the Work Zone that can be removed from the Work Zone.
31. Municipal Solid Waste: Garbage, refuse, sludges, wastes, and other discarded materials resulting from residential and non-industrial operations and activities, such as household activities, office functions, and commercial housekeeping wastes.
32. Negative Air Pressure Equipment: A portable, local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas), and capable of maintaining a constant, low-velocity air flow into regulated areas from adjacent unregulated areas.
33. Non-Liquid PCBs: Materials containing PCBs that, by visual inspection, do not flow at room temperature (25°C or 77°F), or from which no liquid passes when a 100 gram or 100 milliliter representative sample is placed in a mesh number 60 ±5 percent paint filter and allowed to drain at room temperature for five minutes.
34. Non-Porous Surface: A smooth, unpainted solid surface that limits penetration of PCB-containing liquid beyond the immediate surface. Examples include smooth uncorroded metal, natural gas pipe with a thin porous coating originally applied to inhibit corrosion, smooth glass, smooth glazed ceramics, impermeable polished building stone such as marble or granite, and high-density plastics, such as polycarbonates and melamines, which do not absorb organic solvents.
35. On-Site: Within the boundaries of a contiguous property unit.
36. PCB(s): A chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances that contain such substance. Refer to EPA Title 40 CFR, Part 761.1(b) for applicable concentrations of PCBs. PCB and PCBs as contained in PCB Items are defined in EPA Title 40 CFR, Part 761.3.
37. PCB Article: A manufactured article, other than a PCB Article Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. Includes capacitors, transformers, electric motors, pumps, pipes, and other manufactured item which (1) is formed to a specific shape or design during manufacture, (2) has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) has either

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no change of chemical composition during its end use, or only those changes of composition that have no commercial purpose separate from that of the PCB Article.

38. PCB Article Container: A package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.
39. PCB Bulk Product Waste: A waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal is greater than or equal to (≥) 50 ppm PCBs. Does not include PCBs or PCB Items regulated for disposal under EPA Title 40 CFR Parts 761.60(a)-(c), 7611.61, 761.63, or 761.64. PCB Bulk Product Waste is further defined in EPA Title 40 CFR, Part 761.3.
40. PCB Capacitor: A capacitor that contains PCBs at concentration ≥ 500 ppm. Concentration assumptions applicable to capacitors appear under EPA Title 40 CFR, Part 761.2.
41. PCB Equipment: A manufactured item, other than a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.
42. PCB Item: A PCB Article, PCB Article Container, PCB Container, PCB Equipment, or anything that deliberately or unintentionally contains, or has as a part of it, any PCBs.
43. PCB Remediation Waste: Waste containing PCBs in concentrations ≥ 1 ppm as a result of a spill, release, or other unauthorized disposal. This includes wastes generated during PCB removal including containment barriers (polyethylene sheeting, tape, etc.), PPE, waste/decontamination water, used decontamination disposables (e.g., towels, cloths), and other disposables used and generated during PCB removal work. **PCB Remediation Waste must be disposed as a hazardous waste.**
44. PCB Waste(s): PCBs and PCB Items that are subject to the disposal requirements of EPA Title 40 CFR, Part 761, Subpart D.
45. Performance-Based Disposal: Disposal of PCB Bulk Product presumed to contain ≥ 50 ppm PCBs.
46. Porous Surface: A surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal, corroded metal, fibrous glass or glass wool, unglazed ceramics, ceramics with a porous glaze, porous building stone such as sandstone, travertine, limestone, or coral rock, low-density plastics such as Styrofoam™ and low-density polyethylene (poly), coated (varnished or painted) or uncoated wood, concrete or cement, plaster; plasterboard, wallboard, rubber, fiberboard, chipboard, asphalt, or tar paper. For purposes of cleaning and disposing of PCB Remediation Waste, porous surfaces have different requirements than non-porous surfaces.
47. RCRA: The Resource Conservation and Recovery Act (EPA Title 40 CFR, Parts 260 - 265).
48. Regulated Work Zone: An area established by the employer to demarcate where PCB removal is conducted and any adjoining area where debris, and waste from such PCB removal work, accumulates.

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49. Site: The Barnstable Community Horace Mann Charter Public School located at 165 Bearses Way in Hyannis, Massachusetts.
50. Storage for Disposal: Temporary storage area for PCBs that have been designated for disposal.
51. SW-846: The document having the title "SW-846, Test Methods for Evaluating Solid Waste."
52. Totally-Enclosed Manner: A manner that will ensure no exposure to human beings, or the environment, to a concentration of PCBs.
53. Transfer Facility: A transportation-related facility including loading docks, parking areas, and other similar areas where shipments of PCB waste are held during normal transportation. Transport vehicles are not transfer facilities under this definition, unless they are used for the storage of PCB waste, rather than for actual transport activities. Storage areas for PCB waste at transfer facilities are subject to the storage facility standards of EPA Title 40 CFR, Part 761.65, but such storage areas are exempt from the approval requirements of EPA Title 40 CFR, Part 761.65(d) and the recordkeeping requirements of EPA Title 40 CFR, Part 761.180, unless the same PCB waste is stored there for a period of more than 10 consecutive days between destinations.
54. Transporter of PCB Waste: For the purposes of Title 40 CFR, Part 761, Subpart K, any person engaged in the transportation of regulated PCB waste by air, rail, highway, or water for purposes other than consolidation by a generator.
55. Transport Vehicle: A motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (e.g., trailer, railroad freight car) is a separate transport vehicle.
56. TSCA: The Toxic Substances Control Act (15 U.S.C. 2601 et seq.).

1.05 CONSULTANT

A. The Owner shall retain a third-party, environmental hygiene firm (the "Consultant") for the purposes of project management and monitoring during Polychlorinated Biphenyl (PCB) Bulk Product Waste performance-based disposal. The Consultant will represent the Owner in all phases of the PCB performance-based disposal project at the discretion of the Owner. The Asbestos Abatement Contractor and/or Demolition Contractor (collectively the "Contractor") shall regard the Consultant's direction as authoritative and binding (as provided herein) in matters particularly, but not limited to, the following:

1. Work Zone approval
2. Monitoring results review
3. Various segments of work completion
4. Final visual inspection
5. Data submission review

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1.06 USE OF THE CONTRACT DOCUMENTS

A. It shall be incumbent upon the Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the Contractor's failure to visit the Site and understand the existing conditions.

B. All work shall comply with the Contract Documents and with applicable codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern the Work.

C. It is not intended that the Specifications show every detail of the Work, but the Contractor shall be required to furnish, within the Contract Sum, all materials and labor necessary for the completion of the Work in accordance with the intent of the Specifications.

D. In case of ambiguity among the Contract Documents, the more stringent requirement, as determined by the Consultant, shall apply.

E. The Work of this Contract includes making modifications as necessary, subject to approval by the Owner in consultation with the Consultant, to correct any conflicts between Contract Documents.

F. All items, not specifically mentioned in the Specifications, but implied by trade practices to complete the Work, shall be included.

1.07 SITE EXAMINATION

A. It is understood that the Contractor has examined the Site and made their own estimates of the Site facilities and difficulties attending to the execution of the Work, and has based their bid price thereon.

B. Except for unforeseeable concealed conditions as determined by the Consultant, the Contractor shall make no claim for additional cost due to the existing Site conditions.

1.08 CONTRACTOR QUALIFICATIONS

A. All bidders shall submit a record of prior experience in PCB performance-based disposal (or similar) projects, listing no less than three completed projects in the past year, with all projects of similar size and scope. The Contractor shall list the experience and training of the project supervisor and all on-site personnel. The information to be included is as follows:

1. Project Name and Address
2. Owner's Name and Address
3. Architect/Consultant
4. Contract Amount

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5. Completion Date
6. Extras and Changes

B. Submit a written statement regarding whether the Contractor and/or any employees have ever been cited for non-compliance with federal or state regulations pertaining to worker protection, removal, transport, or disposal related to PCBs or other hazardous materials.

1.09 CONSTRUCTION PROGRESS SCHEDULE

A. To assure adequate planning and execution of the Work and to assist the Consultant in reviewing the justification for the Contractor's applications for payment, the Contractor shall prepare and maintain a detailed Progress Schedule.

B. The Contractor shall supervise and direct all work of theirs and other trades using their best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract.

C. Due to the nature of this construction work, the scheduling or phasing of work under this Contract may be adjusted by the Owner. As long as the scope of work is not altered, adjustments to the project phasing shall have no effect on the contract price.

D. The Contractor and any Subcontractors shall attend a pre-construction meeting with the Owner and their Consultant. The assigned Supervisor must attend this meeting.

1.10 TESTING LABORATORY SERVICES

A. The Contractor shall submit to the Consultant the name, address, and qualifications of proposed laboratories intended to be utilized for sample analysis, as required by this Section.

B. Bulk sample collection by the Contractor shall be prohibited without prior written consent of the Owner or their Consultant.

C. If representative composite samples of the anticipated waste stream must be collected and analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for disposal purposes, the Contractor shall seek written approval from the Owner and the Consultant. The Owner or the Consultant may elect to have the testing provided by a third-party, environmental-hygiene firm of their choosing at the Contractor’s expense.

1.11 ADDITIONAL GENERAL REQUIREMENTS

A. The Contractor shall employ a competent Supervisor with at least three years of experience on projects of similar scope and magnitude, who shall be responsible for all work involving performance-based disposal of presumed PCB-containing materials, as described in this Section

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and defined in applicable regulations, and have full-time, daily supervision of the same. The Supervisor shall be the competent person as defined by OSHA regulations.

B. The Contractor shall furnish all labor, materials, facilities, equipment, installation services, employee training, permits, licenses, certifications, agreements, and incidentals necessary to perform the specified work. Work shall be performed in accordance with the Contract Documents, the latest regulations from OSHA, the United State Environmental Protection Agency (EPA), and all other applicable federal, state, and local agencies. Whenever the requirements of the above references conflict or overlap, the more stringent provision shall apply.

C. All project personnel engaged in the work covered under this Section shall be trained in accordance with OSHA Title 29 CFR, Parts 1910.1000 and 1910.1200.

D. This Section specifies the procedures for disposal of existing materials presumed to contain PCBs at concentrations of ≥ 50 ppm. Note that these materials may also contain asbestos.

E. This Section also specifies the procedures for removal and disposal of PCB Bulk Product Waste generated during PCB performance-based disposal. **This includes disposal of containment barriers, PPE, cleaning materials, and supplies as PCB Remediation Waste.**

F. Subsequent cleaning of all adjacent surfaces upon completion of Work is also included in this Section.

G. Disturbance or removal of PCB-containing material may cause a health hazard to workers and building occupants. The Contractor shall disclose to workers, supervisory personnel, subcontractors, and consultants at the Site the seriousness of the hazard and proper work procedures that must be strictly followed.

H. During performance of the Work, workers, supervisory personnel, Subcontractors, or consultants who may encounter, disturb, or otherwise function in the immediate vicinity of the PCB-containing material, shall take continuous measures, as necessary, to protect workers from the hazard of exposure. Such measures shall include the procedures and methods described in this Section, OSHA regulations, EPA regulations, and local requirements, as applicable.

I. If requested or required by local, state, federal, and any other authorities having jurisdiction over such work, the Contractor shall allow the Work of this Contract to be inspected. The Contractor shall immediately notify the Owner and the Consultant, and shall maintain written evidence of such inspection for review by the Owner and the Consultant.

J. The Contractor shall incur the cost of all fines resulting from regulatory non-compliance during the Work, as issued by federal, state, and local agencies. The Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance, or negligence.

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K. The Contractor shall immediately notify the Owner and Consultant when all permits, licenses, certificates of inspection, of approval, or of occupancy, etc. are delivered. The Contractor shall also immediately notify the Owner and Consultant of any other such instruments required under codes by authorities having jurisdiction, regardless of issuer, and shall cause them to be displayed to the Owner and Consultant for verification and recording.

1.12 SUBMITTALS

A. The Contractor shall submit the following to the Consultant, in one complete package, prior to the pre-construction meeting, and no later than 10 business days prior to the anticipated start of the Work:

1. Site-Specific Health and Safety Plan (HASP): The Contractor shall prepare a site-specific HASP plan for protection of workers and control of the work site in accordance with OSHA regulatory requirements located at Title 29 CFR, Part 1910.120. The HASP shall govern all work conducted at the Site during removal of PCB-Containing Materials and related debris, waste handling, sampling, waste management, and waste transportation. At a minimum, the HASP shall address the requirements set forth in OSHA Title 29 CFR, Part 1910.120, as further outlined below:

   a. Health and Safety Organization
   b. Site Description and Hazard Assessment
   c. Training
   d. Medical Surveillance
   e. Work Zones
   f. Personal Protective Equipment
   g. Personal Hygiene and Decontamination
   h. Standard Operating Procedures and Engineering Controls
   i. Emergency Equipment and First Aid Provisions
   j. Equipment Decontamination
   k. Air Monitoring
   l. Telephone List
   m. Emergency Response and Evacuation Procedures and Routes
   n. Site Control
   o. Permit-Required Confined Space Procedures (if applicable)
   p. Spill Prevention Control and Countermeasure (SPCC) Plan
   q. Heat and Cold Stress
   r. Recordkeeping
   s. Community Protection Plan

2. Employee Training, Medical, and Respirator Fit Test Documentation: The Contractor shall submit the following documentation:

   a. Submit documentation of OSHA 40-Hour HAZWOPER training for workers and additional 8-Hour HAZWOPER Supervisor Training for the designated on-site

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Supervisor for the abatement work. All workers shall have required training for other materials, if required, such as asbestos, and a minimum of awareness training for PCBs, consistent with OSHA requirements for hazard communication.

b. Medical clearance and respirator fit test records of each employee who may be on the Site.

3. PCB and/or other Toxic or Hazardous Substances Disposal Plan: A written plan that details the Contractor's plan for transportation and disposal of PCB Bulk Product Waste, PCB Remediation Waste, or other Toxic or Hazardous Substance wastes generated during the project. The Disposal Plan shall identify:

   a. The Contractor's insurance certificate and each landfill's (PCB Bulk Product Waste and PCB Remediation Waste) operating permits and insurance certificates.
   b. Waste packaging, labeling, placarding, and manifesting procedures.
   c. The name, address, and 24-hour contact number for the proposed treatment or disposal facility, or facilities to which waste generated during the project will be transported.
   d. The name, address, contact person(s), and state-specific permit numbers for proposed waste transporters, and EPA and DOT identification number for firms that will transport PCB Bulk Product Waste and PCB Remediation Waste.
   e. The license plate numbers of vehicles to be used in transporting of the waste from the Site to each disposal facility.
   f. The route(s) by which the waste will be transported to the designated disposal facility and states or territories through which the waste will pass.

4. Safely Data Sheets (SDS): SDS and manufacturer's information shall be provided for all chemicals and materials to be used during the project including, but not limited to, specialty cleaners and chemical stripping products.

5. Air Sampling Professional Qualifications: The qualifications of the air sampling professional that the Contractor proposed to use for this project to perform OSHA-required employee exposure monitoring.

No work on the Site will be allowed to begin until the Owner/Architect and the Consultant, as listed herein, approve the Pre-Construction Submittals. Any delay caused by the Contractor's refusal or inability to submit this documentation in a timely manner does not constitute a cause for change order or a time extension.

B. The following documents shall be submitted to the Consultant within 30 working days following removal of waste from the Site:

1. Waste Profile Sheets
2. Pre-Disposal Analysis Test Results (if required by disposal facility)
3. Waste Manifests signed by the disposal facility

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4. Tipping Receipts provided by the disposal facility
5. Certification of Final Treatment/Disposal signed by the responsible disposal facility official.

C. The following shall be submitted to the Consultant at the completion of the Work:

1. Disposal Site Receipts: Copy of waste shipment record(s) and disposal site receipt(s) that indicate that PCB Bulk Product Waste, PCB Remediation Waste or other Toxic or Hazardous Substances materials have been properly disposed.
2. Product Data: Catalog sheets, specifications, and application instructions for any removal products, if used.

1.13 REGULATIONS AND STANDARDS

A. The Contractor shall be solely responsible for conducting the Work and supervising all work in a manner that will be in conformance with all federal, state, and local regulations and guidelines pertaining to PCB Bulk Products performance-based disposal. Specifically, the Contractor shall comply with the requirements of the following:

1. EPA TSCA (Title 40 CFR, Part 761);
2. OSHA HAZWOPER Regulations (Title 29 CFR, Part 1910.120);
3. OSHA Respiratory Protection Standard (Title 29 CFR, Part 1910.134)
4. OSHA Hazard Communication (Title 29 CFR, Part 1910.1200)
5. DOT Hazardous Waste Transportation Regulations (Title 49 CFR, Parts 170 - 180).
6. 2003 International Building Code and all amendments;
7. Life Safety Code (National Fire Protection Association [NFPA]);
8. Local health and safety codes, ordinances or regulations pertaining to PCB remediation and all national codes and standards including ASTM, ANSI, and Underwriter's Laboratories.

1.14 POSTING AND RECORD MAINTENANCE REQUIREMENTS

A. The following items shall be conspicuously displayed proximate, but outside of, removal Work Zones:

1. Exit Routes: Emergency exit procedures and routes.
2. Emergency Phone Numbers: A list indicating the telephone numbers and locations of the local hospital(s), the local emergency squad, the local fire department, the local police department, the Poison Control Center, Chemical Emergency Advise (CHEMTREC), the Department of Health's local office, the Contractor (on-site and after hours numbers), and the Consultant (on-site and after hours contact numbers).

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3. Warning Signs: Warning signs shall be in English and the language of any workers on-site who do not speak English, and be of sufficient size to be clearly legible and display the following or similar language in accordance with OSHA Title 29 CFR, Part 1910.1200:

WARNING
HAZARDOUS WASTE WORK ZONE
PCBs-POISON
NO SMOKING, EATING OR DRINKING
AUTHORIZED PERSONNEL ONLY
PROTECTIVE CLOTHING IS REQUIRED IN THIS AREA

4. In addition, all entrances to Work Zones shall be posted with a PCB M_L.
5. Posting requirements of Section 028213 - Asbestos Abatement are required as well when the material being removed also contains asbestos.

B. The Contractor shall maintain the following items on-site and have copies available for review by all employees and authorized visitors:

1. Contractor's Site-Specific HASP.
2. Training, Medical Clearance, and Respirator Fit Test Record Documentation for all employees and the project Supervisor.
3. Codes, Standards, and Publications.
4. SDS for all chemicals used during the project.
5. Contractor's written hazard communication, respiratory protection, and confined space entry programs.

C. Fees, Permits, and Licenses: The Contractor shall pay all licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing in the performance of the work specified in this Section.

1. The Contractor shall be solely responsible for costs, damages, or losses resulting from any infringement of these patent rights or copyrights. The Contractor shall hold the Owner and the Consultant harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights.
2. The Contractor shall be responsible for securing all necessary permits for work under this Section, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.

1.15 MINIMUM REQUIREMENTS FOR WORKER HEALTH AND SAFETY

A. The Contractor is responsible and liable for the health and safety of all on-site personnel and the off-site community affected by the Work. All on-site workers or other persons entering the Work Zones, decontamination areas, or waste handling and staging areas shall be knowledgeable of and comply with the requirements of the site-specific HASP at all times. The Contractor's

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HASP shall comply with all applicable federal, state, and local regulations protecting human health and the environment from the hazards posed by the Work.

B. Consistent disregard for the provisions of the HASP shall be deemed as sufficient cause for immediate stoppage of work and termination of the Contract or any Subcontracts without compromise or prejudice to the rights of the Owner or Consultant.

C. Any discrepancies between the Contractor's HASP and these Specifications or federal, state, and local regulations shall be resolved in favor of the more stringent requirements that provide the highest degree of protection to the project personnel, the surrounding community, and the environment.

D. In addition to exposure concerns relating to the presence of PCBs, other health and safety considerations will apply to the Work. The Contractor shall be responsible for recognizing such hazards and shall be responsible for the health and safety of the Contractor's employees at all times. It is the Contractor's responsibility to comply with all applicable health and safety regulations.

E. The HASP shall be reviewed by all personnel prior to entry into the PCB removal, decontamination, or waste staging areas. This includes representatives of the Contractor, Owner, Consultant, Subcontractor(s), Waste Transporter, or Federal, State, or Local Regulatory Agencies. Such review shall be acknowledged and documented by the Contractor's Site Supervisor by obtaining the name, signature, and affiliation of all personnel reviewing the HASP.

F. The HASP shall be maintained so as to be readily accessible and reviewable by all site personnel throughout the duration of the PCB performance-based disposal project, and until all waste materials are removed from the Site and disposed at the appropriate disposal facility.

G. The Contractor's Site Supervisor shall be responsible for ensuring that project personnel and site visitors are informed of and comply with the provisions of the HASP.

1.16 WORK ZONES AND ZONES

A. The Contractor shall demarcate and clearly identify Work Zones at the Site. Access by equipment, site personnel, and the general public to the Work Zones shall be limited as follows:

1. Work Zone: The work zone(s) shall consist of all areas where removal of Bulk Products and other Toxic or Hazardous Substances, and waste handling and staging activities are on-going and the immediately surrounding locale or other areas where contamination could occur. For PCB Bulk Product removal purposes or other Toxic or Hazardous Substances for disposal, work shall be performed in each work zone within a regulated work zone (as defined in subsequent Subsections) to demarcate work zones from non-work zones. The regulated Work Zone shall be visibly delineated with appropriate

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warning signs at all approaches to the area (including a PCB M_L), and be restricted from access by all personnel except those directly necessary for the completion of the respective PCB Bulk Product removal and disposal tasks. The Work Zones shall be relocated and delineated, as necessary, as work progresses from one portion of the Site to another, to limit access to each area and to minimize risk of exposure to Site workers and the general public. Access shall be controlled at the periphery of the Work Zones to regulate the flow of personnel and equipment into and out of each zone and to help verify that proper procedures for entering and exiting are followed. All persons within the Work Zones shall wear the appropriate level of PPE established in the Contractor's HASP.

2. Decontamination Zone: The Decontamination Zone is the transition zone between the Work Zone and the clean Support Zone of the Site, and is intended to reduce the potential for contaminants from being dispersed from the Work Zone to clean areas of the Site. The Decontamination Zone shall consist of a buffer area surrounding each Work Zone through which the transfer of equipment, materials, personnel, and containerized waste products will occur, and in which decontamination of equipment, personnel, and clothing will occur. The Decontamination Zones shall be constructed as a three-chambered decon for workers and a two-chambered equipment room for waste load out, as detailed in subsequent Subsections. All emergency response and first aid equipment shall be readily maintained in this zone. All PPE and clothing shall be removed or decontaminated in the Decontamination Zone prior to exiting to the Support Zone. If PPE, clothing, and equipment cannot be decontaminated, it shall be segregated as PCB Remediation Waste and disposed as such.
3. Support Zone: The Support Zone shall consist of the area outside the Decontamination Zones and the remainder of the Site. Administrative and any support activities that by nature need not be conducted in the Work or Decontamination Zone related to the project shall occur in the Support Zone. Access to the Work and Decontamination Zones shall be controlled by the Contractor's Site Supervisor, and limited to those persons necessary to complete the Work, and who have reviewed and signed the Contractor's HASP.

1.17 PERSONNEL PROTECTIVE EQUIPMENT

A. The Contractor shall provide all employees with the appropriate safety equipment and protective clothing to ensure an appropriate level of protection for each task, taking into consideration the chemical, physical, ergonomic, and biological hazards posed by the Site and the Work.

B. The Contractor shall establish criteria for PPE selection and use in the HASP.

C. The PPE to be utilized for the project shall be selected based upon the potential hazards associated with the Site and the Work. Appropriate PPE shall be worn at all times within the Work Zone.

D. The Contractor shall provide the appropriate level of respiratory protection to all field personnel engaged in activities where respiratory hazards exist, or where there is a potential for such hazards to exit.

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E. The Contractor shall provide, as necessary, protective coveralls, disposable gloves, and other protective clothing for all personnel that will be actively involved in waste handling activities, or otherwise present in the Work Zones. Coveralls shall be Tyvek™ or equivalent material. Should the potential for exposure to liquids exist, splash-resistant disposable suits shall be provided and utilized.

F. Protective coveralls and other protective clothing shall be donned and doffed within the Decontamination Zone and shall be disposed as PCB Remediation Waste at the end of each day. Ripped coveralls shall be immediately replaced after appropriate decontamination has been completed to the satisfaction of the Contractor's Site Supervisor. Protective clothing shall not be worn outside of the Decontamination Zone.

G. Hard hats, protective eyewear, rubber boots, and/or other non-skid footwear shall be provided by the Contractor as required for workers and authorized visitors.

H. All contaminated protective clothing, respirator cartridges, and disposable protective items shall be placed into proper containers to be provided by the Contractor for transport and proper disposal as PCB Remediation Waste in accordance EPA regulations.

1.18 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

A. At a minimum, the Contractor shall provide and maintain at the Site the following Emergency and First Aid Equipment:

1. Fire Extinguishers: A minimum of one fire extinguisher shall be supplied and maintained at the Site by the Contractor throughout the duration of the Work. Each extinguisher shall be a 20-pound Class ABC dry fire extinguisher minimum with Underwriters Laboratory approval per OSHA Title 29 CFR, Part 1910.157.
2. First Aid Kit: A minimum of one first aid kit meeting the requirements of OSHA Title 29 CFR, Part 1910.151 shall be supplied and maintained at the Site by the Contractor throughout the duration of the Work.
3. Communications: Telephone communications (either cellular or land line) shall be provided by the Contractor for use by site personnel at all times during the Work.

B. The Contractor's Site Supervisor shall be notified immediately in the event of personal injury, potential exposure to contaminants, or other emergency. The Contractor's Site Supervisor shall then immediately notify the Owner and Consultant.

1.19 STANDARD SAFETY AND HEALTH PROCEDURES AND ENGINEERING CONTROLS

A. The following provisions shall be employed to promote overall safety, personnel hygiene, and personnel decontamination:

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1. Each Contractor or Subcontractor shall ensure that all safety equipment and protective clothing to be utilized by its personnel is maintained in a clean and readily-accessible manner at the Site.
2. All prescription eyeglasses in use on this project shall be safety glasses conforming to ANSI Standard Z87.1. No contact lenses shall be allowed on the Site.
3. Prior to exiting the delineated Decontamination Zone(s), all personnel shall remove protective clothing, and place disposable items in appropriate disposal containers to be dedicated to that purpose. Following removal of PPE, personnel shall thoroughly wash and rinse their face, hands, arms, and other exposed areas with soap and tap water wash and subsequent tap water rinse. A fresh supply of tap water shall be provided at the Site on each work day by the Contractor for this purpose.
4. All PPE used on-site shall either be decontaminated (in accordance with EPA Title 40 CFR, Part 761.79), or containerized at the end of each work day (to be disposed as PCB Remediation Waste). Discarded PPE shall be placed in sealed, DOT-approved 55-gallon drums for off-site disposal.
5. Respirators shall be dedicated to each employee and not interchanged between workers without cleaning and sanitizing.
6. Eating, drinking, chewing gum or tobacco, smoking, and any other practice that increases the likelihood of hand-to-mouth contact shall be prohibited within the delineated Work Zones. Prior to performing these activities, each employee shall thoroughly cleanse their face, hands, arms, and other exposed areas.
7. All personnel shall thoroughly cleanse their face, hands, arms, and other exposed areas prior to using toilet facilities.
8. No alcohol, illicit drugs, or firearms will be allowed on the Site at any time.
9. Contact with potentially contaminated surfaces should be avoided, if possible. Field personnel should minimize walking through standing water/puddles, mud, or other wet or discolored surfaces, kneeling on the ground, and placing equipment, materials or food on the ground, or other potentially contaminated surface.
10. The use of the "Buddy System" shall be employed at all times while conducting work at the Site. Each employee shall frequently monitor other workers for signs of heat stress, chemical exposure, or fatigue by periodically examining others' PPE for signs of wear or damage, routinely communicate with others, and notify the Contractor's Site Supervisor in the case of an emergency.

B. Workers must wear protective suits, protective gloves, eye protection, and a minimum of half-face, air-purifying respirator with dual HEPA-filter cartridges (P100). Respiratory protection shall be in accordance with OSHA Title 29 CFR, Part 1910.134 and ANSI Z88.2.

C. Workers must be trained per OSHA requirements, have medical clearance, and must have recently received a pulmonary function test (PFT) and a respirator fit test by a trained professional.

1. A personal air sampling program shall be in place, as required by OSHA.

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2. The use of respirators must also follow a complete written respiratory protection program as specified by OSHA.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer, the brand name, and the product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises by the end of the day. Material that becomes contaminated with PCBs shall be decontaminated or disposed as PCB Remediation Waste.

C. Poly sheeting, in a roll size to minimize the frequency of joints, shall be delivered to the Site with factory label indicating four (4) or 6-mil thickness.

D. Poly disposable bags shall be 6-mil thickness with pertinent pre-printed labels. Tie wraps for bags shall be plastic, five-inches long (minimum), pointed and looped to secure filled poly bags.

E. Tape or adhesive spray will be capable of sealing joints in adjacent poly sheeting and for attachment of poly sheeting to finished or unfinished surfaces of dissimilar materials, and capable of adhering under both dry and wet conditions, including use of cleaning products.

F. Cleaning Products: The Contractor shall utilize cleaning products such as Simple Green®, Natural Orange™, or other cleaners approved by the Consultant for use in decontaminating porous and non-porous surfaces to remain. All such products shall be utilized in accordance with manufacturer's specifications as intended. The Contractor shall ensure appropriate use and disposal associated with use in accordance with the SDS sheets for each product utilized.

G. The Contractor shall have available spray equipment capable of mixing wetting agent with water and capable of generating sufficient pressure and volume, and having sufficient hose length to reach all PCB Work Zones.

H. The Contractor shall have available enough DOT-approved 17-C or 17-H drums for waste disposal.

2.2 TOOLS AND EQUIPMENT

A. The Contractor shall provide all tools and equipment necessary for PCB removal and disposal.

B. The Contractor's air monitoring professional shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements.

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C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the Work including protective clothing, respirators, respirator filter cartridges, poly sheeting of proper size and thickness, tape, and air filters.

D. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and electrical power sources (such as generators). Any electrical connection work affecting the building electrical power system shall be performed by a Commonwealth of Massachusetts-licensed electrician, and permitted as required.

E. The Contractor shall have available shower stalls and support plumbing including sufficient hose length and drain system, or an acceptable alternate.

F. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

PART 3 - EXECUTION

3.1 PRE-CONSTRUCTION MEETING

A. At least one week prior to the start of work a Pre-Construction Meeting shall be scheduled with the Owner and their Consultant, and must be attended by the Contractor, and any Subcontractors. The assigned Contractor Site Supervisor must also attend this meeting.

B. The Contractor shall present a detailed project schedule and project submittal package at the Pre-Construction Meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and Consultant will inform the Contractor of any scheduling adjustments for this project.

C. Following the Pre-Construction Meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.2 WORK ZONE PROTECTION

A. Where necessary, deactivate electrical power. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with all applicable electrical codes. All installations are to be made by a Commonwealth of Massachusetts-licensed electrician, permitted as required, and located outside the Work Zone.

B. Post warning signs in accordance with OSHA Title 29 CFR, Part 1910.1200 at all approaches to the Work Zone(s). Signs shall be conspicuously posted to permit a person to read signs and take precautionary measures to avoid exposure to PCBs or other Toxic or Hazardous Substances. These signs should include the large PCB M_L markers at each entrance to the Work Zone.

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C. If applicable, refer to Section 028213 - Asbestos Abatement for additional requirements when materials contain asbestos.

D. Separate waste containers for PCB Bulk Product Waste and PCB Remediation Waste shall be located on-site and shall be placed adjacent to work zone or in an area designated by the Owner. Waste containers shall be lined, covered, and secured. The PCB waste containers shall be properly marked as described in EPA Title 40 CFR, Part 761.40. Marking shall include a PCB M_L marker formatted in accordance with EPA Title 40 CFR, Part 761.45.

3.3 DECONTAMINATION ENCLOSURE SYSTEM

A. The Contractor shall establish, contiguous to the work area, a three-chamber decon consisting of equipment room, shower room, and clean room, in series. The only access between contaminated and uncontaminated areas shall be through this decon. If it is not feasible to erect a contiguous decon, the Contractor shall establish a remote decon in as close proximity to the work area as is feasible. For abatement not requiring a NPE, the Contractor shall establish a remote decon at the perimeter of the regulated work area.

B. Access between rooms in the decon shall be through double-flap, curtained openings. The clean room, shower room, and equipment room within the decontamination enclosure, shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.

C. If feasibly, the Contractor shall establish, contiguous with the work area, an equipment decon consisting of 2 totally-enclosed chambers divided by a double-flapped, curtained opening. No personnel are permitted to enter or exit through this unit.

D. Occupied areas and/or building space not within the work areas shall be separated from work areas by means of airtight barriers.

E. Construct the decon with wood or metal framing, cover both sides with 2 layers of 6-mil poly sheeting, completely sealed with spray adhesive, and taped at the joints.

F. If a Consultant is retained for pre-abatement services, the Contractor and the Consultant shall visually inspect barrier several times daily to assure effective seal and the Contractor shall repair defects immediately.

3.4 PCB BULK PRODUCT WASTE REMOVAL PROCEDURES

A. The Contractor shall have a designated OSHA competent person on the Site at all times to ensure proper work practices are implanted throughout the project.

B. The Contractor shall regulate the Work Zone as required for compliance with OSHA Title 29 CFR, Part 1910.1200 to prohibit non-trained workers from entering areas where PCBs are to be removed.

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C. PCB Bulk Products shall be removed in a manner that does not breakdown the materials into fine dust or powder to the extent feasible. Equipment and tools to be utilized shall include hand tools and mechanical equipment, such as demolition hammers, mechanical grinders, etc., to remove PCB Bulk Products from adjacent substrates. Mechanical removal equipment shall be fitted with HEPA-filtered vacuum attachments.

D. Minimal quantities of water shall be utilized to adequately moisten the generated dust prior to collection for disposal. Under no circumstances shall the PCB Bulk Product Waste show evidence of free-liquid water, pooling, or ponding within the waste stream. Any liquid used to wet the dust and debris to control fugitive emissions shall be properly containerized and decontaminated in accordance with EPA Title 40 CFR, Part 761.79(b)(1) or disposed in accordance with EPA Title 40 CFR, Part 761.60(a).

E. Dry or brittle PCB Bulk Products shall be removed with additional engineering controls such as use of HEPA-filtered vacuums and/or wet-wiping methods to remove accumulated dust or debris during removal.

F. Sequence of removal shall follow the following general requirements:

1. Site preparation and controls shall be completed. Work shall not proceed until authorized by the Consultant.
2. PCB Bulk Product Waste shall be removed in entirety for disposal as PCB Bulk Product Waste. Note: Material is also presumed to contain asbestos. Refer to Section 028213 - Asbestos Abatement for additional disposal requirements.
3. Following removal, cleaning of Work Zone shall be performed prior to a final visual inspection by the Consultant. Note that clearance criteria for asbestos may apply. Refer to Section 028213 - Asbestos Abatement for additional clearance requirements.
4. Following an acceptable final visual inspection, the containment barriers, PPE, cleaning materials, products and supplies, and waste generated during removal of PCB Bulk Product Waste shall be containerized for disposal as PCB Remediation Waste (i.e., hazardous waste).

G. Remove and containerize all visible accumulations of PCB Bulk Product Waste and PCB Remediation Waste. Wastes shall be containerized in labeled and signed 6-mil poly disposable bags. Tie wraps for bags shall be plastic, 5-inches long (minimum), pointed and looped to secure filled plastic bags. Disposal bags shall then be placed either in steel 55-gallon DOT-approved drums, or a fully-enclosed roll-off container (with a lock).

H. At any time during PCB Bulk Product removal work should the Consultant suspect contamination of areas outside the Work Zone, the Consultant shall be authorized to issue a stop work order until the Contractor takes required steps to decontaminate these areas, and to eliminate the causes of such contamination. Unprotected individuals shall be prohibited from entering suspected contaminated areas until visual inspections indicate acceptable decontamination.

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I. The Consultant shall conduct a final visual inspection of the Work Zone. If residual suspect debris is identified during the final inspection, the Contractor shall comply with the Consultant's request to render the area clean of all suspect dust and debris.

3.5 CLEANING AND DECONTAMINATION

A. The Contractor shall be responsible for complete cleaning and decontamination of the Work Zone upon completion of work. The Work Zone will be required to meet proposed final visual inspection requirements.

B. The Contractor shall utilize HEPA-filtered vacuum equipment and wet-cleaning products to remove all visible dust and debris from all surfaces within the Work Zone. If specialty cleaning products are utilized, the Contractor shall utilize the product(s) in accordance with manufacturer's specifications, including any additional safety and disposal requirements for such use.

C. Any liquid used to wet the dust and debris to control fugitive emissions shall be collected and decontaminated in accordance with EPA Title 40 CFR, Part 761.79(b)(1), or disposed in accordance with EPA Title 40 CFR, Part 761.60(a). Wash water shall not be discharged on-site.

D. All rags and other materials used to clean the Work Zone shall be properly disposed as PCB Remediation Waste (i.e., hazardous waste). All PCB Remediation Waste shall be stored for disposal in accordance with EPA Title 40 CFR, Part 761.61(a)(5)(v)(A). All waste containers shall be appropriately marked and labeled in accordance with EPA Title 40 CFR, Parts 761.40 and 761.45.

E. Equipment to be utilized in connection with the removal of PCB Bulk Product Waste including waste collection, or that will or may come in direct contact with the Site contaminants, shall be decontaminated prior to leaving the Site to prevent migration of the contaminated residues. Decontamination shall be in accordance with EPA Title 40 CFR, Part 761.79 and Subpart S procedures.

F. All non-disposable equipment and tools employed in the Work will be decontaminated at the conclusion of each work day utilizing the following sequence:

1. Gross debris removal
2. Tap water and detergent or equivalent wash
3. Tap water rinse
4. Hexane or equivalent solvent
5. Air dry
6. Tap water rinse

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G. The wash water and decontamination liquids shall be captured and containerized in DOT-approved 55-gallon drums for off-site disposal in accordance with EPA Title 40 CFR, Part 761.60(a).

3.6 CONSULTANT'S RESPONSIBILITIES

A. If required or requested, the Contractor shall monitor air quality (visually) within the Work Zone to ascertain the protection of employees and to comply with OSHA regulations. The Consultant may verify this monitoring.

B. If required or requested, the Consultant's project monitor shall provide continual evaluation of the condition of the building during removal, using their best professional judgments, in respect to EPA and MassDEP regulations.

3.7 CONSULTANT'S INSPECTION RESPONSIBILITIES

A. The Consultant may conduct inspections throughout the progress of the removal project. Inspections may be conducted to document the progress of the removal work, as well as the procedures and practices employed by the Contractor.

B. The Consultant may perform the following inspections during PCB performance-based disposal activities:

1. Pre-Commencement Inspection: Pre-commencement inspections shall be performed at the time requested by the Contractor. The Consultant shall be informed 24 hours prior to the time the inspection is needed. If deficiencies are identified during the pre-commencement inspection, the Contractor shall perform the necessary adjustments to obtain compliance.
2. Work Zone Inspection: Work Zone inspections may be conducted on a daily basis at the discretion of the Consultant. During the work inspections, the Consultant shall observe the Contractor's removal procedures, verify isolation barrier integrity, assess project progress, and inform the Contractor of specific remedial activities if deficiencies are noted.

C. The Consultant shall perform the following inspection following performance-based disposal activities:

1. Final Visual Inspection: Upon the request of the Contractor, the Consultant shall conduct a final visual inspection of the Work Zone. The final visual inspection shall be conducted after completion of the final cleaning procedures. The final visual inspection shall verify that all PCB Bulk Product Waste residual debris has been removed from the Work Zone. If during the inspection the Consultant identifies residual dust or debris, the Contractor shall comply with the request of the Consultant to render the area "free of suspect dust or debris".

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3.8 MARKING OF WASTE CONTAINERS

A. All waste containers must be marked with the name of the waste contained, the date when waste was first placed in the vessel, and the last date at which addition of waste occurred. All waste containers must be marked with a PCB M_L.

B. All waste containers containing PCB Bulk Product Waste and PCB Remediation Waste in the form of waste and contaminated debris, containment system components, used PPE, personal decontamination and equipment wash water, and any other decontamination fluids or other wastes generated during the Work shall be labeled as follows:

DOT Class 9 UN3432 (solid)
Or UN2315 (liquid) PCB Waste
RQ
Waste for Disposal
Federal law prohibits improper disposal.
If found, contact the nearest police or public safety authority or
The U.S. Environmental Protection Agency.
Generator's Information: _____
Manifest Tracking No.: _____
Accumulation Start Date: _____
EPA ID No.: _____
EPA Waste No.: _____
Total Weight: _____
Container No.: _____
HANDLE WITH CARE

C. In addition, these containers must be marked with a PCB M_L.

D. If applicable, the containers must also be marked in accordance with Section 028213 - Asbestos Abatement.

E. Such marking must be durable, in English, and printed on, or affixed to, the surface of the package, and be displayed on a background of sharply contrasting color not unobscured by labels or attachments, and located away from any other marking (such as advertising) that could substantially reduce its effectiveness.

3.9 ON-SITE WASTE MANAGEMENT AND DISPOSAL OF SOLID HAZARDOUS WASTES

A. All solid waste material, containment system components, used PPE, and other solid wastes generated during the Work, shall be placed directly in appropriate waste receptacles immediately upon removal from its in-situ position. Suitable waste receptacles may consist of roll-off containers or DOT-approved 55-gallon drums.

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B. The Contractor shall be responsible for all packaging, labeling, transport, disposal, and recordkeeping associated with PCB Bulk Product Waste and PCB Remediation Waste in accordance with all federal, state, and local regulations.

C. The Contractor shall ensure that the person transporting the waste holds a valid permit issued in accordance with appropriate federal, state, and local regulations.

D. The Contractor shall provide appropriate shipping records or uniform waste manifests to the transporter at the time of transfer as required by the federal, state, and local regulations with a copy provided to the Owner and Consultant.

E. The Owner should coordinate with the Contractor to sign-off waste materials as the "Generator". The Consultant shall be given 48-hour notice prior to waste leaving the site (i.e., scheduled pick-up by waste hauler).

F. The Contractor shall maintain proper follow-up procedures to assure that waste materials have been received by the designated waste facility in a timely manner, and in accordance with all federal, state, and local regulations.

G. The Contractor shall assure that disposal of PCB Bulk Product Waste and PCB Remediation Waste is at a facility permitted to accept such waste(s) and shall provide a tracking/manifest form signed by the landfill's authorized representative.

H. If roll-off containers are to be utilized for containerization of the PCB performance-based disposal wastes the following shall apply:

1. All roll-off containers, or other similar vessels utilized, shall be watertight and lined with 6-mil poly sheeting or equivalent impermeable lining, and equipped with a secured and impermeable cover.

2. The impermeable cover shall remain securely in-place at all times when waste is not being actively placed in the vessels. The Contractor shall be responsible for ensuring that the cover remains securely intact until the container is removed from the Site. The container must be equipped with a lock.

I. If 55-gallon drums are to be utilized for waste containerization, the drums shall consists of suitable DOT-approved 55-gallon drums that are watertight and free of corrosion, perforations, punctures, or other damage. All drums shall be securely covered and sealed at the conclusion of each work day.

J. The waste containers shall remain staged at the Site with a secure, impermeable cover in-place until the materials are transported from the Site to be delivered to the designated waste disposal facility.

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K. Waste roll-off and barrel staging area shall be designated prior to initiation of the performance-based disposal work, and be approved by the Consultant. If this area is located outside of the building, it is recommended that the area (or areas) be surrounded by a chain-link fence with a minimum height of six feet. The fence shall be labeled with a large PCB M_L marker.

L. Properly containerized waste must be transported by a licensed hauler and be shipped as PCB Bulk Product Waste for disposal at a permitted soil waste facility in accordance with EPA Title 40 CFR, Part 761.62(b).

M. PCB Remediation Waste must be transported by a licensed hauler and be shipped as PCB Remediation Waste for disposal in accordance with EPA Title 40 CFR, Part 761.61(b) at one of the following a facilities:

1. A hazardous waste landfill permitted by EPA under Section 3004 of EPA RCRA;
2. A State authorized landfill under Section 3006 of EPA RCRA; or
3. A chemical waste landfill approved under EPA Title 40 CFR, Part 761.75.

N. Provide required copies of the uniform waste manifests for PCB Remediation Waste to the Owner, waste generation State, and waste destination State, as required.

O. Any PCB liquid water waste shall be properly containerized and decontaminated in accordance with EPA Title 40 CFR, Part 761.79 (b)(1) or disposed in accordance with EPA Title 40 CFR, Part 761.60(a).

P. Any chemicals, solvents, or other products used during decontamination shall be properly containerized as PCB liquid waste. Waste must be properly decontaminated in accordance with EPA Title 40 CFR, Part 761.79 (b)(1) or disposed in accordance with EPA Title 40 CFR, Part 761.60(g).

Q. All contaminated waste shall be carefully loaded on trucks or other appropriate vehicles for transport. Before and during transport, care shall be exercised to insure that no unauthorized persons have access to the waste materials.

R. Waste transporters are prohibited from “back hauling” any freight after PCB waste disposal until decontamination of the vehicle and/or trailer is assured.

END OF SECTION

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SECTION 03 30 00

STRUCTURAL CONCRETE

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Structural Concrete work required to complete the work of the contract including all the Structural Concrete work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Structural Concrete work with all the other trades for the project. Provide all demolition and disposal work to complete the Structural Concrete work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Structural Concrete work includes, but is not limited to:

1. New concrete at bus canopy column footings.

1.03 RELATED WORK

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Excavation, backfilling, and rough grading.

2. Carpentry, except formwork specified herein.

3. Miscellaneous Metals.

1.04 REFERENCE STANDARDS

A. The work shall conform to the codes and standards of the following agencies as further cited herein:

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1. ASTM: American Society for Testing Materials, 1916 Race Street, Philadelphia, PA, 19103, USA as published in "Compilation of ASTM Standards in Building Codes".
2. ACI: American Concrete Institute, P.O. Box 19150, Redford Station, Detroit, MI 48219.
3. CRSI: Concrete Reinforcing Steel Institute, 180 North LaSalle Street, Chicago, IL 60601.

1.05 SUBMITTALS

A. Shop Drawings:

1. Submit complete shop drawings in accordance with the GENERAL CONDITIONS for Consultant's approval. Show plans, elevations, details or job conditions, of all the new concrete work (base contract and any accepted Alternates) and their relationship to other work.
2. Drawings shall consist of sections, plans and details clearly showing location, sizes and spacing of reinforcing that is shown on the working drawings. Include schedules and diagrams to indicate bends, sizes and lengths of reinforcing members. Indicate location of construction and control joints and show additional reinforcing required at these locations. Schedule all accessories and chair bars required to hold slab or other reinforcing in place.
3. Shop drawings will be checked for general location, size, spacing and design details and returned either approved or marked for correction. Make revisions where required and resubmit. No work shall be fabricated for which shop drawings have not been approved.
4. Upon final approval of shop drawings, furnish all copies needed for erection and for use of other trades.
5. Contractor shall be responsible for furnishing and installing all materials called for in Contract Documents even though these materials may have been omitted from approved shop drawings.

1.06 QUALITY ASSURANCE

A. In addition to other standards listed below, concrete shall comply with ACI 301 "Specifications for Structural Concrete".

B. All concrete work shall be performed to insure for the entire job homogeneous concrete having required strength, durability and weathering resistance, without planes of weakness, and other structural defects, and free of pronounced honeycombs, air pockets, voids, projections, offsets of plane, and other defacements on exposed surfaces.

C. Manufacturer's statement attesting to compliance of each shipment of cement with standard specification shall be submitted to the Consultant upon request.

1.07 STORAGE AND HANDLING

A. Handle and store cement to protect from air, ground or other moisture; to permit ready access for inspection; and to protect from contamination by foreign materials. Cement stored longest shall be used first. Caked or hardened cement shall not be used.

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B. Aggregate Protection: Protect aggregates from foreign materials, and store each separately until placed in mixer.

1.08 COORDINATION

A. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work, as necessary to assure the steady progress of all work under the Contract.

1.09 GUARANTEE

A. In addition to the specific guarantee requirements of the GENERAL CONDITIONS and SUPPLEMENTARY GENERAL CONDITIONS, the Contractor shall obtain in the Owner's name the standard written manufacturer's guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

PART 2 – PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: Portland Cement Type II conforming to ASTM C150. Use only one brand and type throughout the project.

B. Fine Aggregate: Natural sand consisting of clean, hard, durable uncoated particles conforming to ASTM C33. Organic content shall be determined according to ASTM C40, and supernatant liquid above test sample shall show color no darker that reference standard color solution prepared at same time. Grading for fine aggregate shall be uniform, and fineness modulus shall never vary more than 0.15 from that of sample used in design mixes.

C. Coarse Aggregate: Crushed stone or gravel conforming to ASTM C33. Maximum size: 3/4 inch.

D. Water: From approved source, potable, clean, and free from oils, salt, alkali, organic matter, and other deleterious material.

E. Water-Reducing Agent: "WRDA" by W.R. Grace and Co., or equal conforming to ASTM C494 as approved by the Consultant. Water reducing agent shall be by same manufacturer as air entraining agent.

F. Air Entraining Agent: "Darex" by W.R. Grace Company, or equal conforming to C260 as approved by the Consultant. Total air entrained shall be 5% of volume concrete.

G. Epoxy adhesive: “HY200” by Hilti, “AC100” by powers, or “SET XP” by Simpson.

2.02 CONCRETE MIX

A. Concrete Mix Requirements:

Compressive Strength	Max. Water to Cement Ratio	Min. Cement Factor
3000 psi	6.0 gallons per yard	5.5 bags per sack
4000 psi	5.5 gallons	6.0 bags per yard

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Submit proposed mix to Consultant for approval before use in work.

B. Maximum size aggregate shall be 3/4 inches.

C. Maximum slump shall be 4 inches.

D. Comply with requirements of ACI 613 "Recommended Practice for Selecting Proportions for Concrete", and ASTM C94 for Ready Mixed Concrete.

E. Unless otherwise noted, all concrete shall have a minimum 28-day compressive strength of 4000 PSI, and shall be uniform in color and finished appearance to the satisfaction of the Consultant.

F. Slab-on-metal deck shall have a minimum 28-day compressive strength of 3,000 PSI.

G. Concrete exposed to weather, such as foundation walls and exterior slabs, shall be air-entrained 5%-7%.

2.03 FORMWORK

A. Formwork shall be in accordance with ACI 347 "Recommended Practice for Concrete Formwork".

B. Formwork materials shall be exterior "Plyform" Class 1, B-B not less than 3/4 inches thick.

C. Forms for Concealed Concrete Work: Forms for all work shall be of sound plywood or other material capable of providing finished surfaces conforming to the intent stated above. Joints shall be sufficiently tight to prevent leakage and shall be flush in the plane of the surface. Place ties in adequate quantity to prevent springing of forms, in locations which will be concealed from view in the finished work and will not interfere with other work under this Section or other Sections.

D. Footing Forms: Forms for footings may be of common lumber or of forms as specified herein for concealed walls, but shall be so erected as to provide full bearing on undisturbed soil, parallel sides, level top surfaces, and cross sections symmetrical with respect to the supported wall, and having dimensions not less than those indicated on the Drawings. No footings shall be placed until completed form installation has been approved by the Consultant and all footings shall have side forms unless prior approval is given to use earth as side forms.

E. Forms for Architectural Concrete: Provide forms and form facing materials of metal, plastic, wood, other acceptable material that is non-reactive with concrete and will produce required finish surfaces. Forms will be constructed without the use of internal form ties.

F. Form Coatings: All forms shall be oiled before reinforcing is placed with a non-staining oil or liquid form coating as approved by the Consultant.

2.04 REINFORCING STEEL

A. Furnish, fabricate, and install in forms all concrete reinforcement and accessories required for the Work. Submit shop drawings for approval.

B. All reinforcing steel shall conform to ASTM A615, Grade 60.

C. Bar reinforcing shall be shop formed cold to dimensions indicated on drawings. Detailing, fabricating, and erecting reinforcing shall conform to ACI 315 "Manual of Standard Practice for Detailing Concrete Structures" and ACI 318 "Building Code Requirements for Reinforced Concrete".

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D. Reinforcement shall be free of paint, dirt, oil, and excessive rust and scale.

E. Chairs, bolsters and the like shall be preformed and manufactured for the express use involved.

PART 3 – EXECUTION

3.01 PLACING REINFORCING STEEL

A. Reinforcing shall be accurately placed as indicated on approved shop drawings and in accordance with CRSI 59 and ACI 318. Dowels shall be tied in place prior to placing concrete. Do not install reinforcing after concrete is placed by inserting into forms.

B. All reinforcing shall be securely tied and supported to maintain proper spacing and cover during placing operations.

C. Install anchor bolts, steel bearing plates, angles and other items furnished under other Sections for building into concrete.

D. All slab reinforcing shall be positioned in place and fully supported on slab bolsters.

3.02 PLACING CONCRETE

A. Contractor to provide dimensioned shop drawings indicated extents, locations and details of all construction, expansion and control joints as well as reinforcing. Placement shall not occur prior to Architect / Owner approval.

B. Deposit concrete only after removal of all water, dirt, and foreign matter from forms, and after checking of forms, sleeves, inserts and reinforcing for proper location.

C. Place concrete only by those methods and arrangements of equipment which comply with Parts V and VI of ACI 614 "Recommended Practice for Measuring, Mixing and Placing Concrete".

D. Vibrate concrete during deposition with internal type, high frequency mechanical vibrator having a speed of not less than 7,000 rpm. Do not use vibrators to move concrete. Supplement all vibration by wooded spade muddling between reinforcing and forms and into corners.

3.03 FIELD QUALITY CONTROL

A. The Consultant may select a qualified Testing Laboratory or Materials Engineer to make inspection tests during the course of work as specified herein and as otherwise considered necessary. Costs of all tests will be paid by the Owner and are not included in the Contract Sum.

B. All measuring, mixing, placing and curing may be subject to inspection by the Laboratory and approval by the Consultant. However, such inspection and approval shall in no way relieve Contractor of his responsibility to fulfill the requirements of this Contract.

C. Contractor shall cooperate in making tests and shall be responsible for notifying designated laboratory in sufficient time to allow taking of cylinders at time of pour.

D. Where test show that concrete is below specified strength, Contractor shall remove all such concrete, as directed by the Consultant. Full cost of removal of low strength concrete and its replacement with concrete of proper specified strength shall be borne by the Contractor.

3.04 CURING AND PROTECTION

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A. Curing shall be started as soon as the concrete has hardened sufficiently to prevent surface damage.

B. Surfaces shall be wet cured for at least five (5) days by use of blankets, or approved curing compound. Blankets shall be thoroughly soaked at all times during this period.

C. In hot weather, all concreting shall be done in accordance with the recommendations of ACI 605 "Recommended Practice for Hot Weather Concreting".

D. In cold weather, all concreting shall be done in accordance with the recommendations of ACI 306 "Recommended Practice for Cold Weather Concreting". Do not place concrete when outside air temperatures are below 40 degrees F without provisions for enclosing and heating as approved by the Consultant.

3.05 FINISHING OF CONCRETE SURFACES

A. Intent for Exposed Concrete Surfaces

1. For all concrete surfaces exposed to view and to the weather, it is the intent of this Specification to require forms, mixtures of concrete, and workmanship so that concrete surfaces, when exposed, will require no patching.

2. All concrete concealed from view, or which will in the opinion of the Consultant be concealed from view at any time when appearance will be a consideration, shall be free from defects affecting structural capacity but may have minor surface deficiencies which may be patched in accordance with the Specifications.

3. All concrete not conforming to these requirements will be condemned by the Consultant and shall be properly and promptly removed and replaced with new work to the satisfaction of the Consultant, at no additional cost to the Owner.

B. At other concrete that may be patched, for honeycomb concrete, stone pockets or voids, the loose concrete and loose cement shall be removed to sound hard concrete. The surface area shall be thoroughly wetted immediately prior to repair. New cement paste shall be used to fill in voids to a hard smooth surface even with adjacent concrete. For larger defects, repairs will be as directed by the Consultant.

C. All sidewalks and plaza concrete finishes shall have tooled control joints in pattern indicated with broom finish. If not shown, provide joints 5’-0” o.c. each way, maximum. Broom direction shall alternate from section to section.

3.06 FORM REMOVAL

A. Do not remove forms or shoring until concrete members have acquired sufficient strength to support their weight and subsequent construction loads without deflection or distress.

B. Remove forms in manner to assure safety of structure.

C. Retain forms in place for a minimum period as follows (assuming curing temperatures above 50 degrees F.)

1. Sidewalks and footings: 2 days

2. Walls: 5 days

END OF SECTION

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SECTION 04 01 00 ***FILE SUB-BID REQUIRED – MASONRY***

MASONRY

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein 04 01 00, and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching

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of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Masonry work required to complete the work of the contract including all the Masonry work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all accessories. Coordinate the Masonry work with all the other trades for the project. Provide all demolition and disposal work to complete the Masonry work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Masonry work includes, but is not limited to:

1. High pressure water blast clean all masonry with detergent. Spot clean efflorescence, grime, paint, oil, rust stains, grease and green moss in advance, and remove all existing deteriorated masonry water repellent / sealer from the brick. Provide test samples for all pressures and cleaning materials. Do not proceed without approval.
2. Furnishing and installation of all accessories associated with masonry, mortar, and grouting to accommodate installation of the Work.
3. Cut and point mortar joints. Color, texture and finish shall match the original mortar and shall be approved in advance by the Architect. Refer to Unit Price Schedule for quantities.
4. The Masonry Filed Sub-Bid Contractor is cautioned that all new through wall membranes, wall flashings, and window sill transitions must be reviewed and approved by the Architect prior to the installation of new or replacement masonry components.
5. Apply clear breathable masonry sealer to 100% of the exterior masonry.
6. Remove existing deteriorated bricks in small individual areas at locations over the entire building area marked in the field by the Architect. Install new brick and mortar to match existing. Refer to Unit price schedule for additional quantities.

1.03 RELATED REQUIREMENTS

A. Section 02 41 00 - Demolition

B. Section 05 50 00 - Metal Fabrications

C. Section 07 0150.19 - Preparation for Re-Roofing

D. Section 07 3113 - Asphalt Shingles

E. Section 07 62 00 - Sheet Metal Flashing and Trim

F. Section 07 90 05 - Joint Sealers

1.04 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.

B. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2010.

C. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2010 .

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D. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

E. ASTM D 522 - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.

F. ASTM D 1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films.

G. ASTM D 2240 - Standard Test Method for Rubber Property - Durometer Hardness.

H. ASTM G 26 - Standard Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials.

I. Brick Institute of America.

J. International Masonry Institute Standards.

K. P ortland Cement Association.

L. FS (Federal Specification) TT-C-555B - Coating, Textured (For Interior and Exterior Masonry Surfaces)

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on all products to be used on the project including but not limited to cement, lime, sand, aggregates, brick, cleaning compounds, cleaning solutions, and each type of masonry unit, accessory, clear sealer, and other manufactured products, including certifications that each type complies with specified requirements. .

C. Samples: Submit three samples of face brick units to illustrate matching color, texture and extremes of color range.

D. Mortar shall match existing in quality, tecture, color, joint size and finish (including aggregate).

E. Provide all submittals with enough notice to accomodate the Schedule. The Contractor will not be entitled to an extension of the Contract because of their lack of planning.

1.06 QUALITY ASSURANCE

A. Restorer: Company specializing in masonry restoration with minimum three years of documented experience.

1.07 MOCK-UPS

A. Clean a 10 ft by 10 ft panel of wall to determine extent of cleaning.

B. Install 16 SF (4' x 4') sample of pointing for approval. This amout shall be in addition to the contract quantities at a location approved by the Architect. Provide multiple colors for approval. It takes one full week for each mortar sample to dry. Provide samples with enough notice to accomodate the Schedule. The Contractor will not be entitled to an extension of the Contract because of their lack of planning.

C. Locate Mock-Ups where directed by the Architect.

D. Mock-up may not remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry neatly stacked and tied on pallets. Store clear off of the ground with adequate waterproof covering. Wet materials will be rejected.

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B. Maintain packaged materials clean, dry, and protected against water exposure, dampness, freezing, and foreign matter.

C. Store and handle brick masonry units and materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

D. Limit moisture absorption of brick masonry units and cement lime, etc., during delivery and until time of installation to the maximum percentage specified for brick for the brick for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.

E. Store aggregates where grading and other required characteristics can be maintained.

F. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.09 FIELD CONDITIONS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

C. Protection of Work:

1. During erection, cover top of masonry element with waterproof sheeting at end of each day's Work.
2. Cover partially completed structures when Work is not in progress.
3. Extend cover min. 24 in. down both sides of walls on structures and hold cover securely in place.
4. Do not apply loads for min. 3 days after building masonry walls or structures.

D. Staining:

1. Prevent grout, mortar or soil from staining the face of masonry to be left exposed.
2. Remove immediately grout or mortar in contact with such masonry.
3. Protect base of walls from rain-splashed mud and mortar splatter by means of covering spread on ground and over wall surface.
4. Protect sills, ledges, and projections from droppings of mortar.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Restoration and Cleaning Chemicals:

1. Cleaning Detergent: PROSOCO; Product EnviroKlean Restoration Cleaner : www.prosoco.com; or approved equal.
2. Spot Cleaning: PROSOCO; SureKlean Fast Acting Stripper #859: www.prosoco.com; or approved equal.
3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Clear Penetrating Surface Sealer, compliant with the latest edition of the Massachusetts Architectural Industrial Maintenance VOC Rule. Provide evidence of compliance with

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VOC Rule from Manufacturer. The sealer shall be compatible to the facade joint sealant material. Provide a 10-year Warranty from the Manufacturer:

1. BASF; Hydrozo Clear 40 VOC
2. Conproco; Sheild MX
3. PROSOCO; SureKlean Weather Seal H40
4. or approved equal

2.02 MATERIALS

A. BRICK UNITS

1. Facing Brick: ASTM C216, Type FBS, Grade SW.
   a. Brick shall be hard burned, water struck, sand molded, or wire cut clay brick to match existing.
   b. Color and texture: shall match existing adjacent brick.
   c. Nominal size: shall match existing brick.
   d. Special shapes: Molded units required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
   e. Compressive strength: Compressive strength shall not be less than 6,000 psi (individual) nor 8,000 psi (average of five) nor shall water absorption exceed 10% (individual) or 8% (average of five) when subjected to 5 hour boiling test, all, measured in accordance with ASTM C67.

2.03 MORTAR MIXES

A. Mortar for Unit Masonry: ASTM C270, Property Specification.

1. Exterior, loadbearing masonry: Type N.
   a. Mortar shall consist of one (1) part Portland Cement (ASTM C150, Type 1, and meeting efflorescence requirements below), ½ to 1-1/4 parts hydrated lime (ASTM C207, Type S), and sand (ASTM C144) in quantity of not less than 2 1/2 nor more than 3 times the sum of the quantities of cement and lime, by volume.

B. Colored Mortar: Proportion selected pigments, aggregate size and clor, and other ingredients to match Architect 's approved sample to match existing mortar, without exceeding manufacturer's recommended pigment-to-cement ratio.

2.04 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

D. Water shall be potable and free of injurious contaminates.

E. No admixtures of any type will be permitted.

F. Do not use anti-freeze compounds to lower the freezing point of mortar.

G. If water is lost by evaporation, re-temper only within two hours of mixing.

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PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to be cleaned are ready for work of this section.

3.02 PREPARATION

A. Protect surrounding elements from damage due to restoration procedures.

B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.

C. Separate areas to be protected from restoration areas using means adequate to prevent damage.

D. Cover existing landscaping with tarpaulins or similar covers.

E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.

F. Close off adjacent occupied areas with dust proof and weatherproof partitions.

G. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.

H. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.03 REPOINTING

A. Perform repointing prior to cleaning masonry surfaces.

B. The joint to be pointed shall be dampened and the brickwork must absorb all surface water.

C. Sawcut out and chisel all loose or disintegrated mortar in joints to minimum 3/4 inch depth or until sound mortar is reached, whichever is greater. During tooling operations, completely infill all voids, holes and honeycombs with mortar prior to pointing operations.

D. Use power tools only after test cuts determine no damage to masonry units will result.

E. Do not damage masonry units.

F. When cutting is complete, remove dust and loose material by brushing.

G. Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch deep layers. Form a smooth, compact mortar joint . When the lift is thumprint hard, the next lift can be installed. Joint finish shall be raked with the aggregate exposed in order to appear slightly eroded.

H. New mortar shall be of a damp, workable consistency which will retain its shape when formed into a ball. The new mortar shall stand in its dampened condition for 1 to 1.5 hours. Water should be added to pre-hydrated mortar to bring it to a workable consistency.

I. New mortar shall match the original mortar. Cut and point a sample area, 4’ x 4’ for approval. No work shall commence without approval of sample by the Owner and CBI. CBI shall be contacted prior to the samples being performed in order that the pointing procedures can be viewed; said procedures shall be representative of the pointing procedures for the entire project, provided they are performed per this specification section and BIA standards.

J. The use of mortar bags and/or mortar guns is strictly prohibited and will be cause for rejection of the work.

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K. Point up all joints including corners, openings, and adjacent Work to provide a neat, uniform appearance, and where applicable prepared for application of sealants.

L. Moist cure all masonry work for 72 hours.

3.04 CLEANING EXISTING MASONRY

A. Cleaning Detergent: Spray clean masonry surfaces at Building A locations with PROSOCO EnviroKlean Restoration Cleaner type cleaning agent in accordance with the manufacturer's instructions. Saturate masonry with clean water and flush loose mortar and dirt.

3.05 RESTORATION CLEANING

A. Spot clean paints, oils, grease, and coatings with SureKlean Fast Acting Stripper by Prosoco, or approved equal.

1. Prepare the surface by thoroughly dry scraping off all peeling and loose paint.
   a. Apply a thick coating of Sure Klean Fast Acting Stripper using a natural fiber cleaning brush, roller or large paint brush.
   b. Allow stripper to dwell on the surface for 15-30 minutes or until coating “lifts” or shows indications of dissolving. Periodic agitation with a stiff bristle bush will improve stripper penetration. Take precautions to prevent passerby from coming near treated surfaces.
      1) NOTE: Stripper should not be allowed to dry on the surface - stripping results may be unsatisfactory. If tests indicate long waiting periods will be necessary, reapply the stripper to prevent the previously applied material from drying.
   c. Remove stripper and residue using pressure rinsing equipment (400-600 psi) or garden hose with adjustable water nozzle. Adjust the nozzle to provide a concentrated stream of water and flush the stripper and residue thoroughly from the surface. Heated water (150°-180°F) may improve stripping efficiency.
   d. NOTE: Coatings that have been on the surface for a number of years will react differently when chemically stripped. Often, removing paints will require multiple applications and increased “dwell” time before complete removal.
   e. Follow by thoroughly cleaning with EnviroKlean Restoration Cleaner according to product instructions.

B. Rinse from the bottom up with potable water applied at 400 psi and at a rate of 4 gal/min.

3.06 FINAL CLEANING

A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.

B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.

C. Clean surrounding surfaces.

D. After mortar is thoroughly set and cured, clean masonry.

E. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

F. Test cleaning methods on sample wall panel; leave ½ panel unclean for comparison purposes.

G. Obtain approval of Architect for sample cleaning before proceeding with cleaning of masonry.

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H. Protect adjacent windows, roofing, flashing, stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

END OF SECTION 04 01 00

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SECTION 05 12 00

STRUCTURAL STEEL

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Structural Steel work required to complete the work of the contract including all the Structural Steel work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Structural Steel work with all the other trades for the project. Provide all demolition and disposal work to complete the Structural Steel work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Structural Steel work includes, but is not limited to:

1. Install new steel roof framing and supports at Roofs 'L' and 'Q'
2. Install hold-down anchors at every other existing roof rafter, all sides of Roof 'A', 'C', 'C2', 'E1', and 'E2'..
3. All steel shall be prime painted. Field prime all welds.

1.03 SECTION INCLUDES

A. Structural steel framing members, support members and straps and base plates.

B. Grouting under base plates.

1.04 RELATED WORK

A. Section 02 41 00 - Selective Demolition

B. Section 05 31 00 - Steel Decking

1.05 REFERENCE STANDARDS

A. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; 2016.

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B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

D. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel; 2004 (Reapproved 2009).

E. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2014.

F. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.

G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

H. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a (Reapproved 2014).

I. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts [Metric]; 2007.

J. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).

K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.

M. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2016.

N. ASTM F436 - Standard Specification for Hardened Steel Washers; 2011.

O. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2007a.

P. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

R. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.

2. Connections not detailed.

3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

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D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.

E. Fabricator Test Reports: Comply with ASTM A1011/A1011M.

F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

G. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Angles and Plates: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Steel Shapes, Plates, and Bars: ASTM A242/A242M high-strength, corrosion-resistant structural steel.

D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

E. Pipe: ASTM A53/A53M, Grade B, Finish black.

F. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436/F436M washers.

G. Unheaded Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563 or ASTM A563M nuts and ASTM F436/F436M Type 1 washers.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

J. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

2.03 FINISH

A. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

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3.02 ERECTION

A. Erect structural steel in compliance with AISC S303 "Code of Standard Practice for Steel Buildings and Bridges".

3.03 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Welded Connections: Visually inspect all field-welded connections in accordance with either of the following:

1. Associate Welding Inspectors (AWI) or higher as defined in AWS B5.1, *Standard For the Qualification of Welding Inspectors*, OR
2. Qualified under the provisions of AWS D1.1/D1.1M subclauses 6.1.4.

END OF SECTION 05 12 00

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SECTION 05 31 00

STEEL DECKING

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Steel Decking work required to complete the work of the contract including all the Steel Decking work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Steel Decking work with all the other trades for the project. Provide all demolition and disposal work to complete the Steel Decking work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Steel Decking work includes, but is not limited to:

1. Provide and install 3 inch deep, 16 ga. metal decking similar to Vulcraft 3N16 as indicated on the Drawings at Roofs 'L' and 'Q'.

1.03 SECTION INCLUDES

A. Roof deck.

B. Supplementary framing for openings up to and including 18 inches wide.

C. Bearing plates and angles.

1.04 RELATED WORK

A. Section 02 41 00 - Selective Demolition

B. Section 05 12 00 - Structural Steel

C. Section 06 10 00 - Rough Carpentry

1.05 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

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B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

C. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

D. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2008.

E. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.

F. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.

B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

D. Certificates: Certify that products furnished meet or exceed specified requirements.

E. Submit manufacturer's installation instructions.

F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.07 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.

1. Calculate to structural working stress design and structural properties specified.

B. Roof Deck: Non-composite type, fluted steel sheet:

1. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
2. Minimum Base Metal Thickness: 16 gage, 0.0625 inch.
3. Nominal Height: 3 inch.
4. Profile: Fluted.

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5. Side Joints: Lapped, mechanically fastened at intervals not exceeding 36" on center, using #10 self drilling screws.
6. End Joints: Lapped, welded at intervals not exceeding 36" on center using 5/8" minimum visible arc spot puddle welds or 1 1/2" long are seam or fillet welds. .

2.02 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.

B. Welding Materials: AWS D1.1/D1.1M.

C. Fasteners: Galvanized hardened steel, self tapping.

D. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.

E. Weld Washers: Mild steel, uncoated, 3/8" inside diameter, inch 1/8 inch thick.

F. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.

2.03 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips at entire roof edge perimeter, 16 gage, 0.0625 inch thick sheet steel; of profile and size as indicated, . primed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.

1. Welding: Use fusion welds through weld washers.

C. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.

D. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.

E. Weld deck in accordance with AWS D1.3/D1.3M.

F. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.

G. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.

H. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION 05 31 00

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SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Metal Fabrications work required to complete the work of the contract including all the Metal Fabrications work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Metal Fabrications work with all the other trades for the project. Provide all demolition and disposal work to complete the Metal Fabrications work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Metal Fabrications work includes, but is not limited to:

1. Furnish and install new aluminum exterior roof ladder and supports as shown in the drawings.

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.

B. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

D. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

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B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

C. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Design metal fabrications under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.02 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.

1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
2. Materials: Aluminum; ASTM B221 (ASTM B221M), 6063 alloy, T52 temper.
3. Finish: Manufacturer's standard clear anodized coating, comply with AAMA 611, Class 1.
4. Manufacturers:
   a. O'Keeffe's, Inc: Model 502 with custom Security Door 24: www.okeeffes.com.
   b. Or Approved Equal.

2.03 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

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PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Identify all steel angle and plate members that have rusted or deteriorated. Determine with the architect which items warrant removal.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Remove all items that have been determined unacceptable for continued use.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 REPAIR WORK

A. For all members that are to remain, clean all rust, loose material and scaling.

B. Allow coatings to properly cure before installation of new construction on top of the members.

3.05 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 50 00

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SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work ofthis Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Rough Carpentry work required to complete the work of the contract including all the Rough Carpentry work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Rough Carpentry work with all the other trades for the project. Provide all demolition and disposal work to complete the Rough Carpentry work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Rough Carpentry work includes, but is not limited to:

1. Replacement of concealed wood blocking, nailers, and supports where indicated on the Drawings.
2. Installation of P.T. blocking, nailers, and supports to accommodate the roofing and windows, and to provide a sound substrate for the anchoring of roofing and window components.
3. Add Alternate #1: The General Contractor shall provide all FRT blocking and plywood sheathing needed to install all the GFRP panels over the existing cupola framing to remain.
    a. Typical sections through the GFRP, shown on the drawings, are intended as the minimum standard. If additional blocking is needed, or in different configurations, it shall be the complete responsibility of the general contractor to furnish and install the blocking necessary for a complete and secure installation.

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b. Scribe to fit all rough carpentry to accommodate the work of the finish carpentry and all GFRP.

c. Cover the entire cupola exterior with ¾" plywood to provide a uniform substrate for the new GFRP finish. Shim plywood to achieve uniform surface dimensions in order to have the GFRP fabricated similarly for each side of the cupola.

d. Repair deteriorated cupola framing. Replace rotted, missing, or broken interior wood sills, wall, and framing with new pressure treated wood. All new framing shall be plumb and true.

e. Cover entire cupola with 15 building felt, lapped 6" minimum. Provide additional layer of 15# building felt at all corners and transitions.

1.03 SECTION INCLUDES

A. Dimensional Lumber.

B. Construction Panels.

C. Accessories.

D. Preservative treated wood materials.

E. Fire retardant treated wood materials.

1.04 RELATED REQUIREMENTS

A. Section 01 22 00 - Unit Prices for incorporation of unit price work.

B. Section 07 54 30 - PVC Single-ply Roofing for all wood members in contact withroofing system.

C. Section 07 61 00 - Sheet Metal Wall Panels for installation of metal wall panels over sheathing panels specified in this section.

1.05 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron andSteel Hardware; 2009.

B. ASTM D2898 - Standard Test Methods for Accelerated Weathering ofFire-Retardant-Treated Wood for Fire Testing; 2010.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

D. AWPA U1 - Use Category System: User Specification for Treated Wood; AmericanWood Protection Association; 2012.

E. PS 1 - Structural Plywood; 2009.

F. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

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C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent Exposure to precipitation during shipping, storage or installation.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for preservative treated wood products.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.

2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Wall Sheathing: Plywood, Fire Retardant – Treated (F.R.T.) with a flame-spread index of 25 or less.

2.04 ACCESSORIES

A. Fasteners and Anchors:

1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for

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highhumidity and preservative-treated wood locations.

B. Water-Resistive Barrier: As specified in Section 07 61 00.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use CategorySystem for wood treatments determined by use categories, expected service conditions,and specific applications.

1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:

1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test extended for an additional 20 minutes before and after accelerated weathering test performed in accordance with ASTM D2898.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. Treat all plywood sheathing panels.
   c. Do not use treated wood in direct contact with the ground.

C. Preservative Treatment:

1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
   a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   b. Treat lumber exposed to weather.
   c. Treat lumber in contact with roofing, flashing, or waterproofing.
   d. Treat lumber in contact with masonry or concrete.
2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
   a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
   b. Treat plywood in contact with roofing, flashing, or waterproofing.
   c. Treat plywood in contact with masonry or concrete.
   d. Treat plywood less than 18 inches above grade.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

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C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.02 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

3.03 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension parallel to grade, using nails or screws.

1. Where metal wall panels are to be placed over the sheathing, place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.

3.05 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING

A. Waste Disposal:

1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

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SECTION 06 15 00 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

WOOD DECKING

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 00, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching

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of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Wood Decking work required to complete the work of the contract including all the Wood Decking work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Wood Decking work with all the other trades for the project. Provide all demolition and disposal work to complete the Wood Decking work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Wood Decking work includes, but is not limited to:

1. Installation of all wood blocking and nailers required for and related to installation of all roofing work.
2. Actual heights of wood blocking at the roof edge shall match the height of the insulation and roof cover board at the highest point of a roof area. Actual heights of wood blocking within the roof shall match the height of the adjacent insulation. Blocking details are schematic and do not reflect the various heights of the blocking at the high points of the tapered insulation.
3. Installation of plywood backing and wood blocking for membrane and sheet metal flashing.
4. Rebuild deteriorated wood at the cupola.

1.03 SECTION INCLUDES

A. Softwood lumber structural wood decking.

B. Plywood structural wood decking.

C. Fire retardant treatment of wood.

D. Preservative treatment of wood.

1.04 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Bearing support.

1.05 REFERENCE STANDARDS

A. AITC 112 - Standard for Tongue-and-Groove Heavy Timber Roof Decking; 1993 and errata.

B. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.

E. PS 1 - Structural Plywood; 2009.

F. SPIB (GR) - Grading Rules; 2014.

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1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures. Do not commence fabrication of any work or begin installation until approval has been obtained from the Architect.

B. Product Data: Provide technical data on wood preservative materials, wood product, and all fasteners.

C. Shop Drawings: Indicate deck framing system, loads and cambers, bearing details, and framed openings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Plywood Decking:

1. Boise Cascade, LLC: www.bc.com.
2. Georgia-Pacific Corporation: www.buildgp.com.
3. Or Approved Equal.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 WOOD NAILERS

A. Wood nailers shall be minimum #2 Structural Grade pressure treated lumber.

B. Plywood backing shall be Marine Grade CDX plywood.

2.03 WOOD MATERIALS

A. Wood fabricated from old growth timber is not permitted.

B. Lumber Decking: Fabricated to AITC 112.

1. Species: graded under SPIB (GR) rules as AITC Select quality.
2. Size: 2 by 6 inches, nominal.
3. Pattern: AITC standard beveled V-joint with single tongue and groove.
4. Moisture Content: 19 percent, maximum.

C. Plywood Decking: PS 1 veneer plywood; APA Rated Sheathing, Span Rating ____; Exterior grade;1 A interior veneer appearance grade; sanded.

2.04 ACCESSORIES

A. Fasteners and Anchors:

1. Fasteners shall be corrosion resistant, coated, hot dipped galvanized, stainless steel or other corrosion resistant material, screw type fasteners, bolts, expansion anchors, as detailed or as required by the membrane manufacturer, or approved equal.

2.05 WOOD TREATMENT

A. Fire Retardant Treatment:

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1. Exterior Type: AWPA U1, Use Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; with maximum flame spread index of 25 when tested in accordance with ASTM E84 and with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; maximum flame spread index of 25 when tested in accordance with ASTM E84 and with no evidence of significant combustion when test is extended for an additional 20 minutes.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. Do not use Type A treated wood in applications exposed to weather or where the wood may become wet.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support framing is ready to receive decking.

3.02 PREPARATION

A. Coordinate placement of bearing items.

3.03 INSTALLATION OF WOOD NAILERS AND BACKING

A. Install all wood nailers and plywood backing as shown in details. Nailers shall be installed using non-corrosive fasteners spaced to resist 300 pounds per foot applied in any direction. All nailers to receive bolts shall be counter-bored to position the nut head slightly below the top of the nailer surface.

B. Nailers should gap 1/8" at ends and corners. The thickness of the nailer shall be provided such that the top of the nailer is flush with the surface to which the membrane is to be applied. Shim with pressure treated stock to achieve correct height.

C. Plywood backing should be gapped 1/8" at ends and corners. The thickness shall be as detailed on the plans. Fasteners shall be as detailed on the plans and at a minimum of 18” on center, staggered, if the spacing is not detailed.

3.04 INSTALLATION - PLYWOOD DECKING

A. Install decking perpendicular to framing members with ends staggered over firm bearing. On sloped surfaces, lay decking with tongue upward.

B. Engage plywood tongue and groove edges.

C. Allow expansion space at edges and ends.

3.05 INSTALLATION - BOARD DECKING

A. Install decking perpendicular to framing members, with ends staggered over firm bearing. On sloped surfaces, lay decking with tongue upward.

B. Engage decking tongue and groove edges.

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C. Secure with fasteners. Side spike planks together, through pre-drilled holes.

END OF SECTION 06 15 00

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SECTION 06 45 50

PVC TRIM

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the PVC Trim work required to complete the work of the contract including all the PVC Trim work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the PVC Trim work with all the other trades for the project. Provide all demolition and disposal work to complete the PVC Trim work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. **ADD ALTERNATE #2 -** PVC Trim work includes, but is not limited to:

1. Provide and install continuous cellular PVC trim at all eave, fascia, soffit, rake and other roof edge trim to match existing wood profiles.
2. Install trim with continuous soffit vent at perimeter of roofs, as detailed on the drawings and with expanded soffit insect mesh.
3. Provide and install cellular PVC siding at the gable end walls where indicated on the drawings.
4. Provide and install PVC louver to match existing wood louver in the gable end walls where indicated on the drawings.

1.03 REFERENCE STANDARDS

A. ASTM D 792 - Density and Specific Gravity of Plastics by Displacement.

B. ASTM D 570 - Water Absorption of Plastics.

C. ASTM D 638 - Tensile Property of Plastics.

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D. ASTM D 790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

E. ASTM D 792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

F. ASTM D 1761- Mechanical Fasteners in Wood.

G. ASTM D 5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by means of a Striker Impacted by Falling Weight.

H. ASTM D 256 - Determining the Pendulum Impact Resistance of Plastics.

I. ASTM D 696 - Coefficient of Linear Thermal Expansion of Plastics Between -30 deg C and 30 deg C with a Vitreous Silica Dilatometer.

J. ASTM D 635 - Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.

K. ASTM E 84 - Surface Burning Characteristics of Building Materials

L. ASTM D 648 - Deflection Temperature of Plastics Under Flexural Load in Edgewise Position.

M. ASTM 3679 - Standard Specification for Rigid Poly Vinyl Chloride (PVC) Siding.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods, including nailing patterns.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

D. Samples: Submit one sample of trim 6 inch long.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum ten years of documented experience.

B. Installer Qualifications: A minimum of 3 years in the installation of PVC products.

C. Mock-Up: Provide a mock-up for evaluation of profiles and installation techniques and workmanship.

1. Finish areas designated by Architect.
2. Include mock-up for each profile combination indicated on the Drawings
3. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
4. Refinish mock-up area as required to produce acceptable work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

B. Store products in manufacturer's unopened packaging until ready for installation.

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1.07 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.08 WARRANTY

A. Warranted to the original Owner under normal and proper use to be free of manufacturing defects for a period of 25 years.

1.09 COORDINATION

A. Coordinate Work with other operations and installation of trim to avoid damage to installed materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: CertainTeed Corp., 750 E. Swedesford Rd., Valley Forge, PA 19482; Tel: 800-233-8990; Fax: 610-341-7940; http://www.certainteed.com/products/trim.

B. Or Approved Equal.

2.02 MATERIAL

A. General: CertainTeed Restoration Millwork is a Freefoam Cellular PVC that is homogenous and free of voids, holes, cracks, and foreign inclusions and other defects. Edges must be square and top and bottom surfaces shall be flat with no convex or concave deviation.

B. Physical Properties: Free foam cellular PVC material with a small-cell microstructure of 0.60 grams/cm3 in accordance with ASTM D 792 with the following physical and performance properties:

1. Mechanical:
   a. Tensile Strength: 1261 psi when tested in accordance with ASTM D 638.
   b. Tensile Modulus: 79,463 psi when tested in accordance with ASTM D 638.
   c. Flexural Strength: 4082 psi when tested in accordance with ASTM D 790.
   d. Nail Hold: 66 (finish nail) lbf/in of penetration when tested in accordance with ASTM D 1761.
   e. Screw Hold: 593 lbf/in of penetration when tested in accordance with ASTM D 1761.
   f. Gardner Impact: 16 in-lbs when tested in accordance with ASTM D 4226.
   g. Charpy Impact (23 deg C): 0.1526 ft-lbs/in when tested in accordance with ASTM D 256.
2. Thermal:
   a. Coefficient of Linear Expansion: 3.2 x10-5 in/in/deg F when tested in accordance with ASTM D 696.
   b. Burning Rate: No burn when flame removed when tested in accordance with ASTM D 635.
   c. Flame Spread Index: 20 when tested in accordance with ASTM E 84.
3. Manufacturing Tolerances:
   a. Variation in component length: minus 0.00 plus 1.00 inch.
   b. Variation in component width: plus or minus 1/16 inch.

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c. Variation in component edge cut: plus or minus 2 degrees.
d. Variation in Density: minus 0 percent to plus 10 percent.

C. Workmanship, Finish, and Appearance:

1. Products are provided with a natural white color and a smooth finish on both sides.
2. Products do not require paint for protection but may be painted to achieve a custom color.

2.03 SIMULATED WOOD TRIM

A. General:

1. Provide simulated wood trim to the following profiles and to the configurations indicated on the Drawings.

2.04 ACCESSORIES

A. Expanded Soffit Vent Insect Screen: stainless steel T-304, 20 Mesh, 0.009 inch vent screen

1. Opening Size: 0.041 inches
2. Weight: 0.109 lbs/sq.ft.
3. Openings per sq/in: 400
4. Standard: ASTM A555-79

B. Fasteners:

1. Use fasteners designed for wood trim and siding (thinner shank, blunt point, full round head).
2. Use a highly durable fastener such as stainless steel or hot dipped galvanized steel.
3. Staples, small brads and wire nails must not be used as fastening members.
4. Fasteners should be long enough to penetrate a solid wood substrate a minimum of 1-1/2 inch (38 mm).
5. The use of standard nail guns is acceptable.
6. Use two fasteners per every framing member for trimboard applications. Use additional fasteners for trimboards 12 inches (305 mm) or wider, as well as sheets.
7. Install fasteners no more than 2 inches (51 mm) from the end of the board.
8. Fasten trim into a flat, solid substrate. Fastening trim into hollow or uneven areas must be avoided.
9. Pre-drilling is typically not required unless a large fastener is used or product is being installed in low temperatures.

C. Adhesives:

1. Glue all trim joints (scarf or miter) with a cellular PVC cement/adhesive such as TrimTight or Bond & Fill.
2. Glue joints should be secured with a fastener and/or fastened on each side of the joint to allow adequate bonding time.
3. Surfaces to be glued should be smooth, clean and in complete contact with each other.
4. Various adhesives may be used. Consult adhesive manufacturer to determine suitability.

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D. Sealants:

1. Use urethane, polyurethane or acrylic based sealants without silicone as specified in Section 07910.

2.05 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Install in accordance with manufacturer's instructions.

1. Comply with all terms necessary to maintain warranty coverage.
2. Use trim details indicated on Drawings.
3. Touch up all field cut edges before installing.

C. Cutting:

1. Use carbide tipped blades designed to cut wood. Do not use fine-tooth metal-cutting blades or plywood blades.
2. Avoid rough edges from cutting caused by: excessive friction, poor board support, worn saw blades or badly aligned tools.

D. Drilling:

1. Drill with standard woodworking drill bits.
2. Do not use bits made for rigid PVC.
3. Avoid frictional heat build-up and remove shavings from the drill hole frequently.

E. Milling:

1. Mill using standard milling machines used to mill lumber.
2. Relief angle 20 to 30 degrees.
3. Cutting speed to be optimized with the number of knives and feed rate.

F. Routing:

1. Use sharp carbide tipped router bits.

G. Edge Finishing:

1. Use machine edging, sanding, grinding, or filling to finish edges.

H. Nail Location:

1. Refer to fastening schedule and diagrams in the most current version of the manufacturer’s installation manual for recommended fastener spacing.
2. Install fasteners no more than 3/4 inches (19 mm) from the end of each board.

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I. Thermal Expansion and Contraction:

1. Expansion and contraction will occur with changes in temperature.
2. When properly fastened, allow 1/4 inch (6 mm) per 18 foot (5.49 m) for expansion and contraction.
3. Joints between pieces should be glued to eliminate joint separation. When gaps are glued on a long run, allow for expansion and contraction at the end of the runs.

J. Finishing.

1. Correct dents and gouges before applying final coating.
2. Prepare surfaces and paint materials as recommended by the molding manufacturer.
3. If moldings get dirty during installation, clean with a soft bristle brush and a bucket of soapy water. For stubborn stains, mold or mildew, use a cleaner suitable for PVC products.

END OF SECTION 06 45 50

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SECTION 06 82 00

GLASS FIBER REINFORCED PLASTIC

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.

D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the GFRP Work required to complete the Work of the Contract including all the GFRP Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all hardware, finishes, and accessories. Coordinate the GFRP Work with all the other trades for the project. Provide all demolition and disposal Work to complete the GFRP Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.

B. **ADD ALTERNATE #1** GFRP Work includes but is not limited to:

1. Glass Fiber Reinforced Plastic (GFRP) fabrications for the replacement of all wood and sheet metal elements over the entire cupola.

2. Embedded and loose connection hardware.

3. GFRP embedded structural supports.

4. The GFRP subcontractor shall coordinate the work with the General Contractor so that all of the existing wood and sheet metal trim needed to provide patterns for making molds is removed from the building in advance of the work. These elements are critical for the successful completion of the GFRP project.

5. Fabricate new molds for GFRP sections and provide separate samples of each type to the Architect for approval.

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6. Coordinate all detailing with the building flashing to provide a watertight assembly. All seams shall be ship lapped. No butt connection will be allowed. All corners shall be pre-molded in the shop or shop fabricated.

7. Note: Many of the conditions needed are shown on the drawings. However, not all are shown. It is the responsibility of the GFRP fabricator to determine all the various sections and pieces needed to provide and install a complete system in every way.

8. A major intent of the work of this section is to provide high quality fiberglass- reinforced polyester shapes for permanent exterior exposure.

9. The intent of the GFRP is to appear as if new wood has been milled, sanded, installed, and painted at the areas of existing wood finish. In the GFRP, the wood grain and the paint strokes must be clearly seen in the finish. A smooth finish, like a boat hull, will not be accepted. All the GFRP shall have the same white color finish. It is the intent to have the large areas of flat wood planking finish replicated to have the planks show proud as individual pieces of plank.

1.03 RELATED WORK

A. Carefully examine all of the contract documents for requirements which affect the work of this section.

B. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:

1. Section 07 62 00 - Flashing and Sheet Metal Flashing and Trim

1.04 REFERENCE STANDARDS

A. FM Approval Guide; current edition.

B. ITS Directory of Listed Products; current edition.

C. UL Online Certificate Directory; current listings at database.ul.com

1.05 QUALITY ASSURANCE

A. Fabricator/Erector: A firm which has at least TEN YEARS experience in work of the type required by this section and with production capacity to provide the work required for this project without delay. The fabricator must provide proof of a minimum 10 successfully completed projects of the same type within a 100 mile radius of this project. Installer to provide all field dimensions to fabricator.

B. Inspection: Permit the Architect or his authorized representative to conduct unlimited inspections at the manufacturer's plant and site. The Architect or his authorized representative reserves the right to inspect units at the plant before shipping.

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C. Mock-ups: After samples are accepted for texture and finish, provide two full scale mock-ups of typical panels and shapes. Approved mock-ups shall serve as the standard of quality required for the work. Approved mock-ups may be incorporated into the finished work.

D. Fire-Rating: Provide material which is fire-retardant to comply with DFC Class 1 Class A - Class 1 Flame Spread of 25 (liquid fillers may be used to achieve the flame spread).

E. Manufacturer shall submit design under direct supervision of a Professional Structural Engineer experienced in the design of this Work and licensed in the State of Massachusetts. Fabrication shall be designed to withstand wind loads. All anchoring members shall be steel.

F. Erector: The General Contractor shall erect all GFRP work. Fabricator will visit the site to coordinate all work, to take all final field measurements, and to obtain all information necessary to mold and fabricate the work. General Contractor to provide vertical access to fabricator to access the work.

1.06 TESTS

A. Testing Agency: The owner may employ an independent testing agency acceptable to the Architect and authorities having jurisdiction to perform tests, inspection, and certificates. Cooperate and permit unlimited access to materials and production plant facilities.

1.07 SUBMITTALS

A. Certifications: Provide certifications stating that materials and fabricated assemblies comply with requirements.

B. Shop Drawings: Provide large scale shop drawings for fabrication and erection of all parts of the work. Provide plans, elevations, and details of anchorage, connections, lifting devices, and accessory items. Provide installation templates and erection drawings for work installed by others and embedded in or attached to other construction. Provide information on erection sequence with plans coded to numbered units. Indicate design load parameters.

C. Verification Samples: Submit representative samples of fabricated work, showing the full range of texture and finish variations expected. Provide three samples having minimum area of 1 square foot each. Approved verification samples will be retained by Architect as the standard of quality required by the work of this section.

D. Schedule: Provide detailed production schedule in detail indicating the sequencing of work including but not limited to removal of material for molds, shop drawings, mold production, samples for approval, full production of all individual pieces, and installation. Coordinate with installer."

E. Protection: Protect newly fabricated GFRP pieces during handling and shipment to eliminate damage, scratches and all mars to the new finish. The fabricator and the General Contractor are completely and solely responsible for protecting the material until final completion of the project. Damage, scratches, and mars to the finish are not acceptable and field touch up will not be permitted, except in the most unusual of cases and only if

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approved by the architect. Damaged material shall not be installed and repaired. Material not fabricated based on approved shop drawings shall be installed.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle fabricated units in strict compliance with fabricator's instructions and recommendations and industry standards. Protect from all possible damage. Support and space units during transit and storage with non-staining shock absorbing resilient spacers.

B. Sequence deliveries to avoid delays, but minimize on-site storage. Store units with identification marks easily accessible.

1.09 FIELD CONDITIONS

A. Do not install site fabricated components when site conditions may be detrimental to successful installation.

B. Maintain temperature and humidity conditions favorable to proper curing of resin during and after installation.

PART 2 - PRODUCTS

2.01 MATERIALS AND PRODUCTS

A. Manufacturer:

1. Basis of Design is Duro Fiber Company, Hudson, NH, Tel (603) 881-4200, Fax (603) 881-4237.

2. Fiberglass Specialties Inc., Henderson, TX 75653, Tel (800) 527-1459, www.fiberglassspecialties.com

3. Or approved equal

B. Materials: Pre-engineered molded fiberglass-reinforced polyester fabrications of isophtallic resin, fire resistant, 95 pounds per cubic foot density, 16,800 psi tensile strength. Surface coat, polyester gelcoat 0.020" thick with UV stabilizers, white to match existing cupola.

1. Flexural Strength; ASTM D-790; 10,000 – 24,000 psi

2. Tensile Strength; ASTM D-638; 10,000 – 14,000 psi

3. Compressive Strength; ASTM D_695; 18,000 – 27,000 psi

C. Connection and Erection Materials: Provide all connection and erection materials needed, including attachments to building structure. All ferrous metal components are to be hot dip galvanized. Touch-up damages or abraded surfaces with zinc rich paint.

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2.02 FABRICATION

A. GENERAL: Fabricated all fiberglass shapes from molds of new shapes closely conforming in dimensions and profiles to existing configurations or contract drawings.

B. MOLDS: Fabricate work to be truly straight, plumb, level and square. Provide work to sizes, shapes and profiles indicated on approved shop drawings. Build in reglets, slots, hanger assemblies and all other work as indicated on approved shop drawings.

C. Thickness of Surface Coat: Accurately provide thickness indicated on approved shop drawings. Make at least two thickness measurements per five square feet.

D. Inserts and Embedments: Properly and securely embed inserts as needed to develop full strength of connections. Maintain proper cover over embedded items.

E. Panel Identification: Mark each unit on a concealed surface with identification mark corresponding to erection drawings and with fabrication date.

2.03 FABRICATION TOLERANCES

A. Dimensional Tolerances: Fabricate units comply with the following dimensional tolerances:

1. Dimensional: +1/8".

2. Warp or Bow: +1/16" per foot, maximum 1/4" total.

2.04 FINISHES

A. Exposed Surfaces: Provide finishes and textures matching approved samples.

1. Directional grain, visible fibers, pinholes in gelcoat and other visible defects are not acceptable.

PART 3 - EXECUTION

3.01 EXECUTION

A. The erector shall examine substrates, supports, and conditions under which this work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means installer accepts substrates and conditions.

3.02 PREPARATION

A. Provide installation templates or diagrams to coordinate correct locations of items which are attached to building structure. Supervise installation to ensure suitability for connection work.

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3.03 INSTALLATION/ERECTION

A. Erection: Lift and handle units at designated lifting points identified for fabricator. Set units level, plumb, and square within specified tolerances. Install and erect units in strict compliance with manufacturer's recommendations. Maintain uniform joint widths and alignment. Install clips, anchors, and all needed accessories. Installer to provide all templates and field dimensions to fabricator.

B. Temporary Supports and Bracing: Provide temporary supports and bracing as required to maintain position, stability, and alignment until permanent connections are made.

3.04 ERECTION TOLERANCES

A. Installation/Erection Tolerances: The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Documents and shall not be added to allowable tolerances indicated for other work.

1. Face Width of Joint for Units: +3/16".

2. Warpage of One Corner Out of Plane with Other Three: 1/16" per foot or 1/8" total.

3. Bowing: Not over L/360, where L is Panel length.

4. Adjacent Units: Flush, +1/8".

3.05 PATCHING

A. Patching Requirements: Patching will be permitted only if structural adequacy of unit and appearance of unit is not impaired. Obtain Architect’s approval of all appearance patching. Remove and replace work that cannot be successfully patched.

3.06 CLEANING AND PROTECTION

A. Clean exposed surfaces materials and methods recommended by fabricator. Do not use chemical cleaning solutions. Remove and replace work that cannot be successfully cleaned. Prevent damage or deterioration of surfaces.

END OF SECTION

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SECTION 07 01 50.19 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 00, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in

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connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Preparation for Re-Roofing work required to complete the work of the contract including all the Preparation for Re-Roofing work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Preparation for Re-Roofing work with all the other trades for the project. Provide all demolition and disposal work to complete the Preparation for Re-Roofing work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is theGeneral Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Preparation for Re-roofing Work includes, but is not limited to:

1. Provide labor, materials and equipment necessary to complete the work of this Section.
2. Roof tear-off. NOTE: Only remove as much roofing as can be completely reinstalled in one day so that the roof is always fully waterproofed with permanent roofing assemblies.
3. Temporary roofing membrane.
4. Roof re-cover preparation.
5. Removal of base flashings.

1.03 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain The Town of Barnstable's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.04 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Existing Membrane Roofing System: Roofing membrane, roof insulation, surfacing, and components and accessories between deck and top surface of roofing system.

C. Roof Re-Cover Preparation: Existing roofing membrane that is to remain and be prepared for reuse.

D. Roof Tear-Off: Removal of existing membrane roofing system from deck.

E. Partial Roof Tear-Off: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system.

F. Remove: Detach items from existing construction and legally dispose of them off-site

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unless indicated to be removed and reinstalled.

G. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Temporary Roofing: Include Product Data and description of temporary roofing system. If temporary roof will remain in place, submit surface preparation requirements needed to receive permanent roof, and submit a letter from roofing membrane manufacturer stating acceptance of the temporary membrane and that its inclusion will not adversely affect the roofing system's resistance to fire and wind.

C. Fastener pull-out test report.

D. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

E. Qualification Data: For Installer.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Installer of new membrane roofing system.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Reroofing Conference: Conduct conference at Project site. Comply with requirements in Division 01. Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with the Owner's Project Manager, Designer, the User Agency's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck repair installer, and installers whose work interfaces with or affects reroofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing system tear-off and replacement, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine existing roof drainage during each stage of reroofing.
5. Examine existing deck substrate conditions and base flashing substrate for reuse.
6. Review existing deck removal procedures and Barnstable Public Schools notifications.
7. Review structural loading limitations of roof deck during reroofing.
8. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect reroofing.
9. Review HVAC shutdown and sealing of air intakes.

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10. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
11. Review procedures for asbestos removal and discovery of asbestos-containing materials.
12. Review existing conditions that may require notification of the Owner's Project Manager and Designer before proceeding.
13. Review governing regulations and requirements for insurance and certificates if applicable.
14. Review temporary protection requirements for existing roofing system that is to remain during and after installation.

1.2 FIELD CONDITIONS

A. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

C. Conditions existing at time of inspection for bidding will be maintained by Barnstable Public Schools as far as practical.

D. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

PART 2 PRODUCTS

2.01 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are responsibilities of Contractor.

B. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface is clear and ready for work of this section.

3.02 PREPARATION

A. Protect existing membrane roofing system that is indicated not to be reroofed.

B. Coordinate with the Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

1. If necessary to deactivate all or a portion of fire-detection system, provide a fire watch during work and for 2 hours after restart of fire-detection system.

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

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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 membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

E. Maintain roof drainage system in functioning condition to ensure roof drainage at end of each workday.

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

F. Verify that rooftop utilities and service piping have been shut off before beginning the Work. Verify that fans and condenser units have been removed before beginning work.

G. Sweep roof surface clean of loose matter.

H. Remove loose refuse and dispose off site.

3.03 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials the same day.

B. Remove metal counter flashings.

C. Scrape roofing gravel from existing built-up membrane surface .

D. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.

E. Cut and lay flat any membrane blisters.

F. Remove damaged insulation and fasteners, cant strips, and blocking,

G. Remove sheathing paper.

H. Prepare existing concrete or metal deck surface. Remove all loose material, infill and prepare to provide smooth working surface for new roof system.

3.04 DECK PREPARATION

A. Inspect deck after tear-off of membrane roofing system.

B. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Owner and Designer. Do not proceed with installation until directed by Owner and Designer.

3.05 INFILL MATERIALS INSTALLATION

A. Immediately after removal of selected portions of existing membrane roofing system, and inspection and repair, if needed, of deck, fill in the tear-off areas to match existing membrane roofing system construction.

1. Installation of infill materials is specified in Division 07 as indicated in Part 2.

2. Install new roofing membrane patch over roof infill area. If new roofing membrane

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is installed the same day tear-off is made, roofing membrane patch is not required.

3.06 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 076200 - Sheet Metal Flashing and Trim.

3.07 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Storage or sale of demolished items or materials on-site is not permitted.

C. TRANSPORT AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS OFF BARNSTABLE PUBLIC SCHOOL'S PROPERTY

3.08 PROTECTION

A. Provide temporary protective sheeting over uncovered deck surfaces.

B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.

C. Provide for surface drainage from sheeting to existing drainage facilities.

D. Do not permit traffic over unprotected or repaired deck surface.

E. Install recovery board over existing membrane.

END OF SECTION

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SECTION 07 21 00

THERMAL INSULATION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all Thermal Insulation work required to complete the work of the contract including all the Thermal Insulation work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Thermal Insulation work with all the other trades for the project. Provide all demolition and disposal work to complete the Thermal Insulation work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Thermal Insulation Work includes, but is not limited to:

1. Installation of Batt insulation for filling perimeter window shim spaces.

1.03 REFERENCE STANDARDS

A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

B. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation in Metal Framed Walls: Batt insulation with separate vapor retarder.

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2.02 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.

1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
2. Formaldehyde Content: Zero.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Tape seal tears or cuts in vapor retarder.

3.03 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

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SECTION 07 22 00 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

VENTILATED NAILBASE INSULATION PANELS

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 00, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching

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of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Ventilated Nailbase Insulation Panels work required to complete the work of the contract including all the Ventilated Nailbase Insulation Panels work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Ventilated Nailbase Insulation Panels work with all the other trades for the project. Provide all demolition and disposal work to complete the Ventilated Nailbase Insulation Panels work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Ventilated Nailbase Insulation Panels work includes, but is not limited to:

1. Provide and install all Ventilated Nailbase Insulation Panels as required for a completely ventilated roofing assembly.

1.03 SECTION INCLUDES

A. Section includes ventilated nailbase insulation panel system.

1.04 RELATED SECTIONS

A. Section 05 31 00 - Steel Decking.

B. Section 06 10 00 - Rough Carpentry.

C. Section 07 51 120 - Wood Roof Blocking.

D. Section 07 31 13 - Asphalt Shingles.

1.05 REFERENCES

A. ASTM C 209 - Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 1289 - Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

C. ASTM D 1621 - Test Methods for Compressive Properties of Rigid Cellular Plastics.

D. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

E. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

F. UL 1256 - Fire Test of Roof Deck Constructions.

G. PS2-92 - Performance Standard for Wood-based Structural-use Panels.

1.06 SYSTEM DESCRIPTION

A. Physical properties (Foam Core):

1. Compressive Strength: ASTM D 1621 and ASTM C 1289, Type II, 20 psi (138 kPa) minimum for Grade 2 and 25 psi (172 kPa) for Grade 3.

2. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).

3. Moisture Vapor Transmission: ASTM E 96, < 1 perm ((57.5ng/ (Pa•s•m2)).

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4. Water Absorption: ASTM C 209, < 1 percent by volume.
5. Service Temperature: -100 degrees to 250 degrees F (-73 degrees C to 122 degrees C).

B. Foam Core R Values: Based on Long Term Thermal Resistance in accordance with ASTM C 1289.

C. UL Assemblies: Insulated metal deck assemblies - UL 1256 (nos. 120, 123) TGDY. R20624 Shingle Deck Accessory; Cool-Vent roof insulation is classified for use with any Class A, B, or C asphalt glass mat or asphalt organic shingles, metal or tile roof coverings.

1.07 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's data sheets on roof panels and fasteners to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures polyisocyanurate insulation panels and assembles ventilated nailbase insulation in-house with no outside fabrication operations.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Store products off the ground, in dry conditions, under cover and in manufacturer's unopened packaging until ready for installation.

B. The manufacturer's plastic wrapping is provided for protection during shipment only. Replace any panels that become wet before installation.

C. Protect insulation from open flame and keep dry at all times.

1.10 PROJECT CONDITIONS

A. Install only as much insulation as can be covered the same day by a completed roof covering material.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Insulating panels shall be Cool Vent produced by Hunter Panels, which is located at: 15 Franklin St. ; Portland, ME 04101; Toll Free Tel: 888-746-1114; Tel: 207-761-5678; Fax: 877-775-1769; Email: request info (schenkem@hpanels.com); Web: <www.hunterpanels.com>

B. Thermacal by Cornell <www.cornellcorporation.com> and will be considered provided performance criteria are met

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

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2.02 PANEL CONSTRUCTION

A. Panels shall consist of a top layer of APA/TECO 5/8" Plywood, a middle layer of vented air space consisting of 1-1/2 inch thick wood spacers and a bottom layer of black fiber reinforced faced polyisocyanurate foam insulation.

1. Polyisocyanurate foam insulation shall conform to ASTM C 1289, Type II.
2. Compressive Strength: 20 pounds per square inch (138 kPa) Grade 2.

B. Panel with wood nailable surface as specified shall be factory rabbetted 1/8 inch (3.2 mm) on all sides to prove for expansion of substrate.

C. Provide at roof area X as indicated on drawings similar product but with 1" air space

2.03 PANEL FASTENERS

A. Fasteners shall be FM Approved Hunter Panel SIP/SD Panel Fasteners for steel deck application. Fasteners have a 3/16 inch (5 mm) shank, and are corrosion resistant with oversized heads. Length of fasteners shall be as recommended by Hunter Panels. Use of 2 inch (51 mm) round plates are not required. See the Hunter Panels application guide for instructions.

1. Fasteners shall penetrate the top flute of steel deck a minimum of 1 inch (25 mm).
2. Penetration of fastener into bottom flute is not acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until structural deck has been properly prepared.

B. Verify deck, adjacent materials, and structural backing is dry and ready to receive insulation.

C. Verify deck surface is flat, free of fins or protrusions and irregularities.

D. If deck preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Apply vapor barrier and or retarder, as specified by the Architect or required by the local building code, to decking prior to the installation.

B. Apply proper ridge and soffit vents to create an effective eave to ridge venting system in conjunction with Cool-Vent.

C. All penetrations through the roof joints between the deck and building walls, hip and ridges, shall have the existing OSB deck fully sealed before the venting panel system is installed with self-adhered air barrier membrane, in order to limit air leakage.

3.03 INSTALLATION

A. Install panels with the wood (OSB/Plywood) side face up. Place panels in the manufacturers recommended pattern. Only factory assembled panels will be accepted. Fasten panels through the top nailable surface and also through the wood block panel spacers using Hunter Panels approved threaded fasteners.

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B. For multiple layered installations, install the base layer of panels loose-laid, and stagger the joints of subsequent layers in accordance with good roofing practice.

C. For roof slopes up to 7/12 pitch, 7 inches (178 mm) rise in 12 inches (304 mm), the minimum number of fasteners shall be 18 per 4 foot by 8 foot (1220 mm by 2440 mm) panel.

D. For roof slopes over 7/12 pitch, 7 inches (178 mm) rise in 12 inches (304 mm), the minimum number of fasteners shall be 24 per 4 foot by 8 foot (1220 mm by 2440 mm) panel.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Do not leave panels exposed to moisture. Wet panels shall be removed or allowed to completely dry prior to application of vapor barrier and/or roof covering.

D. Apply only enough insulation panels per day that can be covered the same day by a completed roof covering material.

END OF SECTION 07 22 00

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SECTION 07 31 10 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

ASPHALT SHINGLES

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 10, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching

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of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Asphalt Shingles work required to complete the work of the contract including all Asphalt Shingles work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Asphalt Shingles work with all the other trades for the project. Provide all demolition and disposal work to complete the Asphalt Shingles work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Asphalt Shingles work includes, but is not limited to:

1. Removal of old asphalt shingle roofing and related elements. Note: Existing step flashing and through-wall flashings to be removed and replaced.
2. New shingle roof system to be applied to all of the sloped roofs including new underlayment and ice and water shield.
3. All related flashing including furnishing and installation of drip edge, pipe penetration flashing boots, vent flashing, toilet exhaust vents, roof exhaust vents, and continuous ridge vents.
4. Install new fully adhered 60 mil EPDM roof membrane on all existing mechanical curbs.

1.03 RELATED WORK IN OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Section 02 41 00, Demolition
2. Section 07 22 00, Ventilated Nailbase Insulation Panels
3. Section 07 62 00, Sheet Metal Flashing and Trim
4. Section 07 62 10, Roof Edge and Ventilation Systems
5. Section 07 90 05, Joint Sealers

1.04 SUBMITTALS

A. Submit complete shop drawings in accordance with the provisions of SECTION 01 30 00 - SUBMITTALS in GENERAL REQUIREMENTS.

B. Submit the following samples in accordance with the provisions of SECTION 01 30 00 - SUBMITTALS in GENERAL REQUIREMENTS.

1. Granule surfaced asphalt shingle roofing.
2. Moisture shedding underlayment, eaves, valley and ridge protection
3. Ice and Water Shield, by W.R. Grace, G.A.F. Stormguard, CertainTeed Winterguard HT Film, or approved equal.
4. Nails.
5. Associated metal flashing and roof edge trim.

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6. Pre-manufactured metal and rubber vent stack boot flashing.

C. Do not commence fabrication of any work or begin installation until approval has been obtained from the Engineer.

1.05 QUALITY ASSURANCE

A. Work must be performed by a firm having not less than five (5) years of successful experience of comparable work and complexity, and employing personnel skilled in the roof shingle work.

B. Only skilled craftsmen shall be present at all times during Asphalt Shingles Work. In the acceptance or rejection of Asphalt Shingles Work, no allowance will be made for lack of skill on the part of the workmen.

C. Roof flashing on curbs shall be applied by a roofing applicator, experienced, approved by the roofing materials manufacturer, using experienced, skilled roofers, having a minimum of five (5) years experience installing this material.

D. All roofing and flashing Work shall be applied in strict accordance with roofing manufacturer's written requirements and specifications applicable to roof conditions. There shall be no deviations made from this specification or the approved shop drawings without prior written approval by the Engineer.

1.06 WARRANTY

A. Shingle Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials [or workmanship] within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.

1. Material Warranty Period: A 40 year warranty from date of Substantial Completion, prorated, with first 12 years non-prorated.

2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 110 mph for 5 years from date of Substantial Completion.

B. Warranty for EPDM Curb Flashing: The roofing Contractor shall supply the Owner with a minimum two-year workmanship warranty. In the event any Work related to roofing, flashings, or metal Work is found to be defective or otherwise not in accordance with the Contract Documents with two years of Substantial Completion, the roofing Contractor shall remove and replace at not cost to the Owner. The Contractor's warranty obligation shall run directly to the Owner.

C. Special Project Warranty: Roofing Installer's warranty, on warranty form at the end of this Section, signed by Roofing Installer, covering Work of this Section, in which Roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within the following warranty period:

1. Warranty Period: Five (5) years from date of Substantial Completion.

2. All penetrations through the roof joints between the deck and building walls, hip and ridges, shall have the existing deck fully sealed before the venting panel system is installed with self-adhered air barrier membrane, in order to limit air leakage.

D. Upon successful completion of the Work and receipt of final payment, the Roofing Manufacturer's Warranty shall be issued.

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PART 2 – PRODUCTS

2.01 ROOFING MATERIALS

A. Provide 40 year asphalt shingles, Owens Corning Woodmar, or approved equal asphalt shingles, conforming to: ASTM D 3018 Type I - Self-Sealing; UL Certification of ASTM D 3462, UL 997 minimum 110-mph Wind Resistance, and UL Class A Fire Resistance; glass fiber mat base, ceramically colored/UV resistant mineral surface granules across entire face of shingle, 465 lb/sq.

B. Underlayment shall be one (1) layer of 15# asphalt saturated felt such as "CertainTeed "Roofers' Select", as manufactured CertainTeed Corporation, or approved equal conforming to ASTM D-226.

C. Nails shall be 11 or 12 gauge hot-dipped galvanized ring shank roofing nails (or equivalent), having large heads (at least 3/8 inch diameter) and shanks which are one and one half inch long.

D. Ice and water shield to be pre-formed, mastic-permeated material by W.R. Grace, G.A.F. Stormguard, CertainTeed Winterguard HT Film, or approved equal. Ice and water shield shall extend a minimum of 36” inboard of the heated wall line and around all roofing penetrations. See plans for extent.

E. Continuous ridge and soffit vent at all roofing shall be in accordance with Section 07 62 10 (Roof Edge and Ventilation Systems).

F. Air barrier membrane and primer shall be self-adhering membrane vapor by W.R. Grace, or the approved equal.

2.02 SHEET METAL MATERIALS

A. All new drip edge shall be .040" aluminum, as noted on plans, formed to extend a minimum of 5” inches onto the roof deck from the roof edge.

B. Miscellaneous metal flashing, shall be minimum .032" aluminum as shown on the plans.

C. Pipe penetration boots shall be fabricated with a silicone boot, properly sized to fit the appropriate pipe and installed properly so that the boot sheds water, as manufactured by LifeTime Tool, supplied through GAF, or approved equal.

D. Flashing termination sealant shall be butyl-based, non-hardening, Firestone Water Block, or approved equal.

E. Air barrier membrane and primer shall be self-adhering membrane vapor by W.R. Grace, or the approved equal.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that deck is of sufficient thickness to accept fasteners.

C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.

D. Verify roof openings are correctly framed.

E. Verify deck surfaces are dry, free of ridges, warps, or voids.

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3.02 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.

C. Broom clean deck surfaces before installing underlayment or eave protection.

3.03 SHINGLE APPLICATION

A. An ice and water shield shall be applied at the edge of the roof along the eaves and rake. Ice shield shall be set starting from the eaves, 72” minimum (two courses), and extending to a point 36” inside the inside wall line of the building. Ice and water shield shall be applied directly to the wood deck with 4" side laps and 6" end laps.

B. A minimum of two layers, each layer lapped 50%, of 15# asphalt saturated roofing felt shall be applied horizontally to the roof as underlayment under the entire shingled area, including over the ice and water shield.

C. All penetrations through the roof joints between the deck and building walls, hip and ridges, shall have the existing deck fully sealed before the venting panel system is installed with self-adhered air barrier membrane, in order to limit air leakage.

D. A starter course of shingles shall be applied at the eaves before the first full course of shingles is applied. The starter course shall be either a row of asphalt shingles cut 7 inches from the top or a 7 inch wide (minimum) starter strip of mineral-surfaced asphalt roll roofing positioned with the lower edge of the material overhanging the drip edge 1/4" to 3/8". Inverting a course of shingles is not an acceptable starter course. The material shall be fastened with roofing nails along a line that is parallel to and 5-1/2 inches above the eave edge. The nails shall be placed at 1-1/2, 11, and 13 inches in from each side and in such a way that the nail heads will not be exposed either at cutouts or spaces between shingle tabs in the first course.

E. Shingles shall be attached with four nails per shingle.

F. The first course of shingles shall be started using full shingles with the first shingle positioned to overhang the rake and eave 1/4" to 3/8". Succeeding courses shall be started from the rake with partial shingles as shown in detail.

G. Hip and Ridge Locations

1. Asphalt shingles should be butted and nailed as they progress up either side of a hip or ridge.
2. Individual shingle tabs 12 inches by 12 inches should be cut and bent lengthwise across their centers for use as hip and ridge coverings. The unexposed portion of each tab should be cut slightly on each side so that it is narrower than the exposed portion.
3. Application of these covers should begin at the lower end of a hip or at either end of a ridge. The covers should be applied shingle fashion.
4. Secure each shingle with one fastener on each side 5-1/2 inches back from the exposed end and one inch up from the edge.
5. The peak of a cricket shall be treated as a ridge.

H. Valley Flashing

1. Apply a continuous 36” wide strip of ice and water shield centered in the valley. The courses of felt underlayment from the field of the roof should be cut to overlap the

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valley strip by no less than 6 inches. The valley flashing strip should be applied so that the eaves flashing strip is then applied over it.

2. The valley should then be shingled in a closed or woven type valley construction. Each shingle strip shall extend a minimum of twelve inches beyond the center of the valley. No nails shall be driven within 6 inches of the center of the valley. One extra nail shall be driven in the top end corner of the shingle strip.
3. The valleys between the roof surface and crickets shall be treated as valley flashing.

3.04 INSTALLATION OF METAL FLASHINGS AND SHEET METAL

A. The drip edge shall be applied directly to the roof deck along the eave and rake. At the eave the drip edge shall be attached with a layer of underlayment over it. Underlayment shall be provided between the roof deck and the drip edge along the rakes. The drip edge shall extend at least 3/8" beyond the edge of the deck and shall be nailed at 4 inches on center.

B. Pipe penetration boots shall be installed so that the silicone boot fits snugly around the pipe and extends vertically as to prevent water from being trapped. A 24" x 24" sheet of ice shield shall be installed, centered on the pipe, directly on the plywood, before the boot is installed. The boot shall be shingled into the roofing system as per manufacturer's recommendations and acceptable roofing practices.

C. Continuous ridge vent shall be applied to the ridge of the main roof. The vent shall be nailed at 4" o.c. and shall be installed to shed water as per manufacturer's recommendations and acceptable roofing practices.

END OF SECTION 07 31 10

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SECTION 07 41 13 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

METAL ROOF PANELS

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 00, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching

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of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Metal Roof Panels work required to complete the work of the contract including all the Metal Roof Panels work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Metal Roof Panels work with all the other trades for the project. Provide all demolition and disposal work to complete the Metal Roof Panels work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Metal Roof Panels work includes, but is not limited to:

1. Provide and install all Metal Roof Panels as required for a completely water-tight roofing assembly at roofs 'L' and 'Q'..

1.03 SECTION INCLUDES

A. Architectural roofing system of preformed aluminum panels.

B. Fastening system.

C. Factory finishing.

D. Accessories and miscellaneous components.

1.04 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Roof sheathing.

1.05 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010 (Reapproved 2015).

D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Storage and handling requirements and recommendations.

2. Installation methods.

3. Specimen warranty.

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C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.

1. Show work to be field-fabricated or field-assembled.

D. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project.

1. Not less than 5 years of documented experience.

B. Installer Qualifications: Company trained and authorized by roofing system manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 20 year period from date of Substantial Completion.

C. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of 5 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design is based on Tite-Loc Plus with 2" high seams that are mechanically seamed together @ 180 degrees, manufactured by Petersen Aluminum Corporation Petersen Aluminum Corp, Annapolis Junction, MD, 800-344-1400, but may be by an Approved Equal.

2.02 ARCHITECTURAL METAL ROOF PANELS

A. Architectural Metal Roofing: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.

B. Metal Panels: Factory-formed panels with factory-applied finish.

1. Aluminum Panels:
   a. Alloy: Aluminum conforming to ASTM B209 (ASTM B209M); temper as required for forming.
   b. Thickness: Minimum 20 gage (0.032 inch).
2. Profile: Standing seam, with minimum 1.0 inch seam height; concealed fastener system for field seaming with special tool.

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3. Texture: Smooth.
4. Width: Maximum panel coverage of 24 inches.

2.03 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.04 PANEL FINISH

A. Fluoropolymer Coating System: Manufacturer's standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil; color and gloss to match sample.

2.05 ACCESSORIES AND MISCELLANEOUS ITEMS

A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.

B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.

C. Sealants:

1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane as recommended by the Standing Seam Panel Manufacturer.
2. Concealed Sealant: Non-curing butyl sealant or tape sealant.

D. Roofing Underlayment

1. On all surfaces to be covered with roofing material, furnish and install a 40 mil "Peel & Stick membrane", required as outlined by metal panel manufacturer. Membrane to be a minimum of 40 mil thickness, smooth, non-granular, by one of the following manufacturers:
   a. W.R Grace "Ice & water Shield"
   b. Cetco Strongseal
   c. Carlisle CCW WIP 300HT
   d. Interwrap Titanium PSU
   e. MFM Corp "Wind & Water Shield"
   f. Polyguard Deck Guard HT of Polyglas HT
   g. Tamko TW Tile and Metal Underlayment
2. Underlayment shall be laid in horizontal layers with joints lapped toward the eaves a minimum of 6", and well secured along laps and at ends as necessary to properly hold the felt in place. All underlayment shall be preserved unbroken and whole.
3. Ice and Water Shield shall lap all hips and ridges at least 12" to form double thickness and shall be lapped 6" over the metal of any valley or built-in gutters and shall be installed as required by the Standing Seam Panel Manufacturer to attain the desired 20 Year Weathertightness Warranty.

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2.06 FABRICATION

A. Panels: Fabricate panels and accessory items at factory, using manufacturer92s standard processes as required to achieve specified appearance and performance requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.

B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.

C. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.

1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.

C. Roof Panels: Install panels in strict accordance with manufacturer92s instructions, minimizing transverse joints except at junction with penetrations.

3.04 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.05 PROTECTION

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

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B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION 07 41 13

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SECTION 07 42 13

METAL WALL PANELS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Metal Wall Panels work required to complete the work of the contract including all the Metal Wall Panels work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Metal Wall Panels work with all the other trades for the project. Provide all demolition and disposal work to complete the Metal Wall Panels work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Metal Wall Panels work includes, but is not limited to:

1. Provide and install all Metal Wall Panels as required for a complete soffit / ceiling assembly under roofs 'L' and 'Q'..

1.03 SECTION INCLUDES

A. Manufactured metal panels for soffits, with related flashings and accessory components.

1.04 SUBMITTALS

A. Shop Drawings: Indicate dimensions, layout, joints, construction details, and methods of anchorage.

B. Samples: Submit two samples of wall panel and soffit panel, 12 inch by 12 inch in size illustrating finish color, sheen, and texture.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum 5 years of documented experience.

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B. Installer Qualifications: Company specializing in installing products of the type specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

1.07 PERFORMANCE

A. Soffit System shall be designed to meet Standard Building Code wind load requirements.

B. Soffit System shall be designed to meet applicable Local Building Code and the Soffit System shall have been tested by the Manufacturer per ASTM E-330 and have the applicable Load Tables published from this Air Bag testing for negative loads.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a twenty year period after Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

C. Correct defective work within a two year period after Date of Substantial Completion, including defects in water tightness and integrity of seals.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Soffit Panels:

1. ATAS International, Inc; Wind-Lok Soffit Panel: www.atas.com/sle.
2. Petersen Aluminum Corp, Annapolis Junction, MD, 800-344-1400, Flush Wall Panel.
3. IMETCO, Tucker, GA, Soffit Panel.
4. Or Approved Equal.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MANUFACTURED METAL PANELS

A. Soffit Panels:

1. Profile: Flush / Reveal.
2. Material: Precoated aluminum sheet, 18 gage, 0.0403 inch minimum thickness.
3. Color: As selected by Architect from manufacturer's standard line.

B. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

C. Expansion Joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.

D. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

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E. Anchors: Galvanized steel.

2.03 FINISHES

A. Custom Fluoropolymer Coating System: Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness (DFT) of 0.9 mil; color and gloss as indicated on drawings.

2.04 ACCESSORIES

A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

B. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.

C. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.

1. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces and shall allow for thermal movement of the wall panel system. Exposed fasteners shall not restrict free movement of the roof panel system resulting from thermal forces, except at designed points of roof panel fixity

D. Field Touch-up Paint: As recommended by panel manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building framing members are ready to receive panels.

3.02 INSTALLATION

A. Install panels on soffits in accordance with manufacturer's instructions.

B. Fasten panels to structural supports; aligned, level, and plumb.

END OF SECTION 07 42 13

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SECTION 07 54 00 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

FULLY ADHERED TPO ROOFING SYSTEM

PART 1 - GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 00, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.

D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

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1.02 WORK TO BE PERFORMED

A. Provide all the TPO Sheet Roofing Work required to complete the Work of the Contract including all the TPO Sheet Roofing Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all hardware, finishes, and accessories. Coordinate the TPO Sheet Roofing Work with all the other trades for the project. Provide all demolition and disposal Work to complete the TPO Sheet Roofing Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.

B. TPO Sheet Roofing Work includes but is not limited to:

1. Furnish and install a new complete fully adhered single-ply membrane roofing system, including but not limited to ALL:

   a. .080 thermal plastic olefin (TPO) reinforced roofing membrane.

   b. 30 mil self-adhering vapor barrier.

   c. All roof wood blocking.

   d. Tapered rigid polyisocyanurate insulation; base layer shall be mechanically attached with subsequent layers adhered.

   e. 1/2-inch thick high density rigid polyisocyanurate cover board adhered to the top layer of the insulation.

   f. TPO membrane wall, penetration and system flashings.

   g. TPO clad metal drip edge flashing.

   h. Insulation and membrane fasteners and plates.

   i. Insulation and membrane adhesives, sealants, caulking and mastics.

   j. Warranties: 25-year NDL Total Roofing System Warranty

1.03 SUBMITTALS

A. Submit complete shop drawings in accordance with the provisions of SECTION 01 30 00 - SUBMITTALS in GENERAL REQUIREMENTS. Shop drawings required include but are not limited to:

1. Tapered Insulation plan.

2. Roof edge and gutter flashing detail.

3. Base Flashings

4. Vent Pipe detail

5. Hot Vent Pipe Detail

B. Submit the following samples in accordance with the provisions of SECTION 01 30 00 - SUBMITTALS in GENERAL REQUIREMENTS.

1. Roofing membrane manufacturer's membrane flashing, termination bars, metal flashings, and two of each fastener.

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2. Edge metal materials, details and installation instructions.

C. Do not commence fabrication of any Work or begin installation until approval has been obtained from the Consultant.

1.04 QUALITY ASSURANCE

A. Roofing and flashing shall be applied by a roofing applicator licensed, franchised, or approved by the roofing materials manufacturer prior to bid, using experienced, skilled roofers. The Contractor shall submit, with their bid, written verification from the manufacturer that he/she is an authorized applicator.

B. All roofing and flashing Work shall be applied in strict accordance with roofing manufacturer's written requirements and specifications applicable to roof conditions. There shall be no deviations made from this specification or the approved shop drawings without prior written approval by the Consultant.

C. Manufacturer Qualifications:

1. Company specializing in manufacturing the roofing membrane specified in this section with ten (10) years of roof product manufacturing experience.

2. Manufacturer must be able to provide the project with the membrane and Isocyanurate insulation that is produced in their facilities.

D. Applicator Qualifications:

1. Shall be a current Manufacturer’s licensed Contractor.

2. Shall have at least five (5) years experience in installing specified system or similar.

1.05 JOB CONDITIONS

A. Do not use bitumen-based roof cement.

B. Do not install membrane directly onto low melting point asphalt (ASTM-D312, Type I & II) or coal tar roof surface.

C. Do not expose membrane or accessories to a constant temperature in excess of 180 degrees F.

D. Do not allow direct steam venting to come into contact with the roofing membrane.

E. The Contractor is cautioned that certain TPO membranes are incompatible with asphalt, coal tar and oil-based materials and cements. Creosote and penta-based materials are also incompatible. Such materials should not come in contact with TPO membranes at any time. If such contacts occur, the material shall be cut out and discarded. The Contractor should consult manufacturer with respect to material compatibility, precautions, and recommendations.

F. Cements and bonding adhesives contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near fire. Consult container labels and material safety data sheets for specific information.

G. Splicing and bonding surfaces shall be clean and dry.

H. Expose only enough cement and adhesive to be used within a four hour period.

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I. All surfaces to receive new insulation, membrane or flashings shall be thoroughly dry. Should surface moisture occur, the Contractor shall provide the necessary equipment to dry the surface prior to application.

J. Only as much of the new roofing as can be made weathertight each day, including all flashings and metal Work shall be installed.

K. Each day's roofing Work shall be completed in accordance with the manufacturer's specifications, including flashings, welding, and seam sealing.

1.06 WARRANTY

A. 25-year No Dollar Limit Total System Roofing Manufacturers System Warranty.

1. Wind Speed Warranty Coverage: 105 miles per hour.

B. Roofing Contractor's Workmanship Warranty:

1. The roofing Contractor shall supply the Owner with a minimum two-year Workmanship warranty. In the event any Work related to roofing, flashings, or metal Work is found to be defective or otherwise not in accordance with the Contract documents within two years of substantial completion, the roofing Contractor shall remove and replace at no cost to the Owner. The Contractor's warranty obligation shall run directly to the Owner, and a copy shall be sent to the membrane manufacturer.

1.07 QUALITY INSPECTION/OBSERVATION

A. Inspection by Manufacturer: A representative of the roofing manufacturer shall visit the project a minimum of three (3) times during the course of the work and submit an interim inspection report to the Consultant.

1. During initial installation of the membrane.
2. Upon 50% Completion.
3. Upon Completion of the work.

A. Provide a final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer.

1. Technical Representative shall not perform any sales functions.
2. Contractor shall complete any necessary repairs required by the manufacturer.

1.08 PRE-INSTALLATION CONFERENCE

A. Before start of Roofing Work, attend a conference to discuss the proper installation of materials. Attendees shall include all parties directly affecting Work of this Section.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers dry, undamaged, with seals and labels intact and legible.

B. Store all materials clear of ground and moisture with weather protective covering.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice.

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B. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application. Consult Manufacturer's Technical Specifications on cold weather application.

PART 2 – PRODUCTS

2.01 NAILERS FOR FLANGES AND ROOF ACCESSORIES

A. Description: Structural Grade No. 2 or better Southern Pine, Douglas Fir, or Exterior Grade plywood. All wood shall be pressure treated for rot resistance.

1. Nailer width: Minimum 3 ½ in. (nominal) wide or as wide as the nailing flange of each roof accessory.

2. Nailer thickness: Thickness of roof insulation.

B. Reference Standards:

1. Southern Pines: PS 20; SPIB Grading Rules.

2. Western Woods: PS 20; WWPA Grading Rules.

3. Plywood: PS 1; APA Grade Stamps.

4. Pressure preservative treatment: AWPB LP2.

2.02 MANUFACTURERS - MEMBRANE MATERIALS

A. Acceptable roofing membrane manufacturers for this Work are: Firestone Building Products or Approved Equal.

B. The following sections are based on the Firestone Building Products, Reinforced Ultra Ply TPO single-ply membrane system. Acceptable manufacturer's materials shall be shown to meet or exceed these materials standards.

2.03 TPO SHEET ROOFING SYSTEM COMPONENTS

A. Roof Membrane:

1. Description: Reinforced 0.080 ULTRAPLY TPO membrane.

a. Color: White or Tan, as indicated on the Drawings

B. ULTRAPLY TPO Flashing:

1. Description: Non-reinforced, TPO, single-ply flashing composed of Thermoplastic Polyolefin polymer and Ethylene Propylene Rubber.

a. Nominal Thickness: 0.080"

C. RIGID INSULATION

1. Insulation system shall have a minimum total Long Term Thermal Resistance (LTTR) of an LTTR-30 above the roof deck.

2. A rigid polyisocyanurate foam insulation with black mat facers. Thicknesses and compressive strength as noted on Project Drawings.

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a. Insulation boards shall be Tapered and Flat

b. Compressive Strength 25-psi

3. Cover board shall be approved by the roofing membrane manufacturer as an approved substrate to adhere to.

a. Thickness: 1/2 inch.

b. Weight: 2.5 lb./sq. ft.

c. Surfacing: Fiberglass mat with non-asphaltic coating.

d. Flexural Strength: 100 lbf, minimum

e. Permeance: greater than 17 perms

f. Water Absorption: Less than 10 percent of weight.

g. Compressing Strength: 900 pounds per square inch.

h. Products: DensDeck Prime by Georgia-Pacific Gypsum LLC, or approved equal.

D. BONDING ADHESIVE

1. Description: SBR-based, formulated for compatibility with the ULTRAPLY TPO membrane & a wide variety of substrate materials, including masonry, wood, and insulation facings.

2. Product/Producer:

a. ULTRAPLY TPO Bonding Adhesive.

D. Pourable Sealer:

1. Description: 2-Part urethane, 2-color for reliable mixing.

E. Termination Bar:

1. Description: 1.3" x 0.10" thick aluminum bar with integral caulk ledge.

F. TPO Cut Edge Sealant:

1. Polymeric sealant for use where exposed reinforcement is encountered.

G. TPO General Purpose Sealant:

1. Polymeric one part general purpose sealant

H. Firestone UltraPly TPO Coated Metal:

1. Galvanized Steel with Manufacturers bonded TPO Coating.

I. UltraPly TPO Molded Flashing Accessories:

1. Unreinforced UltraPly TPO membrane Pre-Molded for a variety of flashing details (i.e. Pipe Boots, Inside-Outside corners, etc.).

2.04 METAL FLASHING

A. Edge Metal and/or Coping:

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1. Description: Provide 0.050” Kynar coated aluminum over continuous aluminum extrusion, Anchorgard SP, by Una-clad, or approved equal. Color to be selected from standard color chart.

B. TPO Coated Metal: 24 GA hot-dip G90 galvanized steel with TPO membrane bonded to one side.

2.05 MISCELLANEOUS

A. Roof Walkway Pads:

1. Description: Reinforced ULTRAPLY TPO Walkway Pads, 0.13" x 30" x 50' with patterned traffic bearing surface.

B. TPO molded inside corners.

C. TPO molded outside corners.

D. TPO molded pipe boots.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine roof deck to determine that it is sufficiently rigid to support roofers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.

B. Verify that surfaces and site conditions are ready to receive Work. Correct defects in the substrate before commencing with Roofing Work.

C. Examine roof substrate to verify that it is properly sloped to drains.

D. Start Work with sealants and adhesives at 60°-80° F.

E. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Appropriate measures must be taken to assure that fumes from adhesive solvents are not drawn into the building through air intakes.

F. Remove existing roof system components as specified.

G. The surface must be clean, dry, smooth, and free of sharp edges, fins, loose or foreign materials, oil, grease and other materials which may damage the membrane. All roughened surfaces that could cause damage shall be properly repaired before proceeding.

H. All surface voids of the immediate substrate greater than 1/4" wide must be properly filled with an acceptable insulation or suitable fill material.

3.02 PROTECTION OF OTHER WORK

A. Protect metal, glass, plastic, and painted surfaces from adhesives and sealants.

B. Protect neighboring Work, property, cars, and persons from spills and overspray from adhesives, sealants and coatings and from damage related to Roofing Work.

C. Protect finished areas of the roofing system from roofing related Work traffic and traffic by other trades.

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3.03 MATERIAL STORAGE AND HANDLING

A. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

B. Consult container labels and Material Safety Data Sheets (MSDS) for specific safety instructions.

C. Deliver materials to job site in their original containers as labeled by the manufacturer.

3.05 MEMBRANE INSTALLATION

A. Place membrane panel, over the substrate in its final position.

B. After making sure the sheet is placed in its final position allowing for a 3" lap, fold it back evenly onto itself so as to expose the underside.

Note: Where UltraPly TPO Membrane has been cut to expose reinforcing membrane, Firestone's UltraPly TPO Cut Edge Sealant or UltraPly TPO General Purpose Sealant must be used to encapsulate exposed edge.

C. Sweep the mating surface of the membrane with a stiff broom to remove any dirt that may have accumulated.

D. Apply UltraPly TPO bonding adhesive at about the same time to both the exposed underside of the sheet and the substrate to which it will be adhered so as to allow approximately the same drying time.

E. Do not apply bonding adhesive over an area that is to be later heat welded to another sheet or flashing.

F. Allow bonding adhesive to flash off until tacky. Touch the bonding adhesive surface with a clean, dry finger to be certain that the adhesive film is dry to the touch and there is no wet adhesive beneath the top adhesive film. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions.

G. Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly so as to minimize wrinkles.

H. To ensure proper contact, compress the bonded half of the sheet to the substrate with a stiff push broom.

I. Fold the unadhered half of the membrane sheet back onto itself, and repeat the procedure to complete the bonding of the sheet.

3.06 MEMBRANE LAP SPLICING

A. Lap splice areas that have been contaminated must be wiped down with a dry or damp (water only) clean cloth prior to heat welding and allow to completely dry.

B. All field and flashing splices on the horizontal surface shall be completed using an automatic heat welder which has been designed for hot air welding of thermoplastic membranes.

C. Hand-held welders are only to be used on vertical welds or where an automatic welder is not practical or cannot be used.

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D. Seams made with the automatic welder shall be a minimum of 1-1/2" wide. Seams made with hand welders shall be a minimum of 2" wide. Use 2" wide silicone or silicone coated steel hand rollers to assure proper mating of surfaces as hand heat welding proceeds.

E. Probe all completed welds using a slotted screwdriver or cotter pin puller type tool to verify seam integrity. Do not probe welds until they have had time to cool to ambient conditions. Any welds found to be insufficiently welded need to be repaired on a daily basis.

3.07 MEMBRANE SECUREMENT

A. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than 1" in 12" except for round pipe penetrations less than 18" in diameter and square penetrations less than 4" square.

3.08 FLASHING - PENETRATIONS

A. General

1. Remove all existing flashings (i.e. lead, asphalt, mastic, etc.).
2. Flash all penetrations passing through the membrane.
3. The flashing seal must be made directly to the penetration.

B. Pipes, Round Supports, etc.

1. Flash with Firestone Pre-Molded UltraPly Pipe Flashings where practical.
2. Flash using UltraPly membrane when Pre-Molded Flashing is not practical.

C. Structural Steel Tubing: Use a field fabricated pipe flashing detail provided that the minimum corner radius is greater than 1/4" and the longest side of the tube does not exceed 12". When the tube exceeds 12" use a standard curb detail.

D. Roof Drains

1. Remove all existing flashings, drain leads, roofing materials and cement from the existing drain in preparation for membrane and Water Block Seal.
2. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
3. Taper insulation around the drain to provide a smooth 4’-0” transition from the roof surface to the drain. Use pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope. Slope shall not exceed Firestone recommendations.
4. Position the UltraPly TPO membrane, then cut a hole for the roof drain to allow 1/2"-3/4" of membrane extending inside the clamping ring past the drain bolts.
5. Make round holes in the UltraPly TPO membrane to align with clamping bolts. Do not cut the membrane back to the bolt holes.
6. Place Water Block Seal on top of drain bowl where the clamping ring seats below the membrane.
7. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve constant compression.

E. Pipe Clusters and Unusually-Shaped Penetrations

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1. Fabricate penetration pockets to allow a minimum clearance of 1" between the penetration and all sides.
2. Secure penetration pockets per Firestone Details.
3. Fill penetration pockets with Pourable Sealer, so as to shed water. Pourable Sealer shall be a minimum of 2" deep.

F. Hot Pipes: Protect the UltraPly TPO components from direct contact with steam or heat sources when the in-service temperature is in excess of 140º F. In all such cases flash to an intermediate insulated "cool" sleeve per Firestone details.

G. Flexible Penetrations

1. Provide a weathertight gooseneck set in Water Block Seal and secured to the deck.
2. Flash in accordance with Firestone Details.

H. Scuppers

1. Remove existing scupper and provide a new welded watertight scupper or clean the existing scupper for reuse.
2. Set welded watertight scupper in Water Block Seal and secure to the structure.
3. Flash in accordance with Firestone/Manufacturer Details.

I. Expansion Joints

1. Install as shown on roof drawings in accordance with Firestone/Manufacturer details.

3.09 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, SKYLIGHTS, ETC.

A. General: Using the longest pieces practical, flash all walls, parapets, curbs, etc., a minimum of 8” high per Firestone Details.

B. Evaluate the substrate and overlay per Firestone/Manufacturer specifications as necessary.

C. Remove all existing flashings.

D. Remove excessive asphalt to provide a smooth, sound surface for new flashings. Install separation sheet as recommended by manufacturer.

E. Apply UltraPly TPO Bonding Adhesive at about the same time to both the membrane flashing and the surface to which it is being bonded so as to allow approximately the same drying time. Apply TPO Bonding Adhesive by rolling the adhesive on to the mating surfaces evenly, avoiding globs or puddles.

F. Allow TPO Bonding Adhesive to flash off until tacky. Touch the TPO Bonding Adhesive surface with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, pushing straight down to check for stringing, also push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions.

G. Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles.

H. To ensure proper contact, compress the flashing to the substrate with a stiff push broom.

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I. Complete the splice between membrane flashing and the main roof sheet by hot air welding. Provide lap splices in accordance with Firestone details.

J. Provide termination directly to the vertical substrate as shown in Firestone Details.

K. Install TPO-Joint covers at field and flashing splice intersections as required by Firestone.

L. Install intermediate flashing attachment as required by Firestone Specifications and Details

3.10 FLASHING - GRAVEL STOPS OR ROOF EDGE METALS

A. Flash all gravel stops or roof edges as outlined in Firestone/Manufacturer Details.

3.11 TEMPORARY CLOSURE

A. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the Roofing Contractor. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

3.12 ROOF WALKWAYS

A. Walkways may consist of Firestone UltraPly TPO Walkway material. Heat weld the perimeters of the walkway material to the UltraPly TPO membrane per Firestone/Manufacturer specifications.

3.13 SHEET METAL WORK

A. Install Firestone supplied sheet metal as shown on roof drawings.

B. Follow current industry guidelines for installation or Firestone/Manufacturer requirements, whichever is more stringent.

3.14 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed as required by the manufacturer. A final inspection of the roof shall be scheduled by the installer to include a Technical Representative of the Manufacturer and the Architect to document conditions that are not in compliance with the specifications or manufacturer's recommended installation procedures and details.

B. Correct identified defects or irregularities.

3.15 CLEAN-UP

A. Clean all contaminants from building and surrounding areas.

B. Remove trash, debris, equipment from project site and surrounding areas.

C. Repair or replace damaged building components or surrounding areas to the satisfaction of the building Owner.

END OF SECTION

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SECTION 07 62 00 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 10, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in

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connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Sheet Metal Flashing and Trim work required to complete the work of the contract including all the Sheet Metal Flashing and Trim work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all accessories. Coordinate the Sheet Metal Flashing and Trim work with all the other trades for the project. Provide all demolition and disposal work to complete the Sheet Metal Flashing and Trim work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, and each Subcontractor for the entire project so that all the work can be properly and completely performed.

B. Sheet Metal Flashing and Trim work includes, but is not limited to:

1. Furnish and install flashings, as shown in drawings, for all roofing and for all other metal flashing and trim shown on the plans.
2. Furnish and install sheet metal items, including flashings, counterflashings, and edge metal, scuppers, through-wall and head flashings and metal flashing and trim indicated on the drawings.
3. Reglets and accessories.

1.03 RELATED REQUIREMENTS

A. Section 07 54 00 - Fully Adhered TPO Roofing system.

B. Section 07 61 00 - Sheet Metal Roofing.

C. Section 07 71 23 - Manufactured Gutters and Downspouts.

D. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.04 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

E. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2012.

F. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

G. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

H. CDA A4050 - Copper in Architecture - Handbook; Copper Development Association,

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Inc.; current edition.

I. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples 12 x 12 inch in size illustrating metal finish color.

1.07 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA 1793 and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 0.040 inch thick; plain finish shop pre-coated with fluoropolymer coating.

1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.

2. Color: As selected by Architect from manufacturer's standard colors.

B. Supply new through-wall flashing [(16 oz.zinc coated copper)] with [solder joints (lap joints bedded in non-hardening butyl sealant, Tremco - Curtainwall Sealant, Firestone - Water Block, Carlisle - Water Cutoff, or approved equal] to be installed by the Masonry Filed Sub-Bidder.

C. Fasteners for Copper Work:

1. Screws for copper: Brass wood screws of sizes most appropreiate for the function.

2. Nails for copper: Hard copper barbed nails, not smaller than No. 2 or 12 stub gauge with large flat heads, and of sufficient length to penetrate the wood a minimum of 7/8".

3. Copper rivets: 1/8" diameter

D. Underlayment: Breathable 10 perm minimum, self-adhering fabric Vaproshield, Wrap

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Shield SA, or approved equal.

E. TPO coated metal - See Section 07 54 00.

1. Color: As selected by Architect from manufacturer's standard colors.

2.02 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.

E. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

F. Plastic Cement: ASTM D4586, Type I.

G. Solder: ASTM B32; Sn50 (50/50) type.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet, minimum 2 inches wide, interlocking with sheet.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch; miter and seam corners.

E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Tin edges of copper sheet to be soldered. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints.

G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

I. Fabricate flashings to allow toe to extend 2 inches over roofing edge. Return and brake edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

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C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION OF METAL FLASHING AND SHEET METAL

A. General: Fabricate and install flashings and other sheet metal work in accordance with the general procedures specified in accordance with thte publications entitled: "Modern Application of Sheet Copper in Building Construction" and "Copper and Common Sense".

B. In all cases, use special care in installation procedures to ensure sufficient allowances for expansion and contraction of each type of metal.

C. Use rivet connections of metal in preference to solder connections, except where visual appearance is a major factor. when solder joints are specified or necessitated, ensure that all surfaces are pre-tinned and that the proper flux is used.

D. Verify all wood nailers and other surfaces to which fasteners will be installed and request correction of same from the General Contractor, where surfaces would not otherwise properly receive fastenings.

E. Generally, flashings and other sheet metal work shall be in lengths not exceeding 8' and free from longitudinal joints. Coat all flashing in contact with dissimilar metal with asphalt paint.

F. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

G. Apply plastic cement compound between metal flashings and felt flashings.

H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

I. Seal aluminum joints watertight.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

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SECTION 07 62 10 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

ROOF EDGE AND VENTILATION SYSTEMS

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 10, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00, and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

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1.02 WORK TO BE PERFORMED

A. Provide all the Roof Edge and Ventilation Systems work required to complete the work of the contract including all the Roof Edge and Ventilation Systems work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Roof Edge and Ventilation Systems work with all the other trades for the project. Provide all demolition and disposal work to complete the Roof Edge and Ventilation Systems work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Roof Edge and Ventilation Systems work includes, but is not limited to:

1. Furnish and install Roof Edge and Ventilation Systems and accessories as detailed on the drawings.

1.03 SECTION INCLUDES

A. Metal Fascia.

B. Vented and Non-Vented Eave and Fascia.

C. Ridge Vent.

D. Accessories.

1.04 RELATED SECTIONS

A. Section 06 15 00 – Wood Decking.

B. Section 07 22 00 - Ventilated Nailbase.

C. Section 07 31 13 - Asphalt Shingles.

D. Section 07 62 00 - Sheet Metal Flashing and Trim.

E. Section 07 72 00 – Roof Accessories: Soffit vents, etc.

1.05 REFERENCES

A. ANSI/SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.06 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

C. Shop Drawings: Show profiles, joining method, location of accessory items, anchorage and flashing details, adjacent construction interface, and dimensions.

D. Selection Samples: For each finish product specified, two complete sets of color charts representing manufacturer's full range of available colors and patterns.

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E. Verification Samples: For each finish product specified, two sample chips representing actual product, color, and patterns.

F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum twenty five years documented experience.

B. Installer Qualifications: Company specializing in the installation of products specified in this section with minimum five years documented experience.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store materials in a dry, protected, well-vented area.

C. Remove protective plastic surface film immediately before installation.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.09 SEQUENCING

A. Ensure that information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

C. Coordinate installation with roof manufacturer’s installation instructions.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

A. Provide the manufacturer’s warranty specified under products for the roof edge system, when installed per manufacturer’s instructions. Warranty will not exceed the life of the roofing on which the product was originally installed.

B. Provide a 30 year warranty for manufacturer approved 70 percent Kynar colors for the painted finish covering color fade, chalk, and film integrity.

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PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Metal-Era Roof Edge Systems; 1600 Airport Rd., Waukesha, WI 53188. ASD. Toll Free: (800) 558-2162. Phone: (262) 549-6900. Fax: (800) 373-9156, Web Site: www.metalera.com. Email: info@metalera.com. Metal Era has been selected as a Basis of Design. Other manufacturers that may be considered for this project provided these manufacturers fully comply with the specifications herein are:

1. Hunter Panels Air Flow system
2. Atlas Energy Products Techni-flo ventilation system

B. Substitutions: Permitted, provided the products meet the specified criteria.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

D. Hi-Perf Vented Fascia:

1. Construction:
   a. Metal:
      1) .040 inch (1.01 mm) aluminum.
   b. Finish:
      1) Standard color Kynar-500 as selected by the Architect from roof edge manufacturer's color chart.
   c. Perforated Support Screen: 24 gauge formed steel with 54 percent free openings.
   d. Roof Flange and Backer Material: G90 Galvanized Steel with Formed Aluminum Studs.
2. System:
   a. Vented Nailbase Version:
      1) Model HPNB-60 - 12 inch Coverage.
3. Performance:
   a. Ventilation: Must meet the required net free air per linear foot (nfa/lf) as determined by the vented roof deck system and eave condition as indicated on the Drawings.
   b. 20 Year, 120 mph Wind and Ventilation Warranty.

E. Hi-Perf Rake Panel:

1. Construction:
   a. Metal:
      1) .040 inch (1.01 mm) aluminum.
   b. Finish:
      1) Standard color Kynar-500 as selected by the Architect from roof edge manufacturer's color chart.
   c. Roof Flange and Backer Material: G90 Galvanized Steel
2. System:
   a. Model HPRP-100 -10 inch Coverage.
3. Performance: 5 Year Workmanship Warranty

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F. Hi-Perf Ridge Vent:

1. Construction:
   a. Metal:
      1) 0.040 inch aluminum.
   b. Finish:
      1) Standard color Kynar-500 as selected by the Architect from roof edge manufacturer's color chart.
   c. Expanded Metal Support Screen: .050 inch (1.27 mm) Formed Aluminum.
   d. Continuous Z Brackets: 20ga G90 Galvanized Steel.
2. Vent System:
   a. Slope to Slope Shingled For Heavy Snow Load Conditions: HPS-HSL - 45 psf.
   b. Sloped Roof Meets High Wall Version: Model: HPSH.
3. Performance:
   a. Ventilation: Must meet the required net free air per linear foot (nfa/lf) as determined by the vented roof deck system and eave condition as indicated on the Drawings.
   b. 20 Year, 120 mph Wind and Ventilation Warranty
   c. Meets Florida Building Code (HZHZ) Test Protocol TAS 100(A)-95 Test Procedure for wind and wind driven rain resistance and/or increased wind speed resistance of soffit ventilation strip and intermittent ventilation system installed at ridge area.

2.02 ACCESSORIES

A. Miters and end caps shall be fabricated by manufacturer to suit the conditions indicated on the Drawings.

B. Provide fasteners consistent with manufacturer’s instructions for each product that is suitable for the substrate to which it is being installed.

C. Provide gutters and gutter clogs to attach to face of fascia vents. Color to match vents.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that the substrate is dry, clean and free of foreign matter.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Verify the manufacturer’s roof edge details for accuracy to fit the assembly prior to fabrication.

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3.03 INSTALLATION

A. Install in accordance with manufacturer's installation instructions.

B. Use provided fasteners consistent with manufacturer’s instructions, suitable for the substrate to which it is being installed.

C. Install water cut-off, as recommended by the membrane manufacturer, under the anchor bar.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07 62 10

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SECTION 07 70 50 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

ROOF DRAINS

PART 1 – GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 10, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.

D. It is the intent of the Specifications and the Drawings to require that the equipment and materials to be furnished complete in every respect, and that this Contractor shall provide all items needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Roof Drain Work required to complete the Work of the Contract

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including all the Roof Drain Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all hardware, finishes, and accessories. Coordinate the Roof Drain Work with all the other trades for the project. Provide all demolition and disposal Work to complete the Roof Drain Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section and Subcontractor for the entire project so that all the Work can be properly and completely performed.

B. The Work of this Section includes, but is not limited to:

1. The Contractor shall remove existing and install new roof drain assemblies including cast iron drain bowls, below deck clamps, clamping ring assemblies, drain strainers, gravel guards, anchors, bolts, etc, as detailed on the plans. The Contractor is responsible for providing any and all alterations to the roof drain assembly to accommodate the new Work. This includes the proper installation of all necessary drain supports and drain leaders.
2. All new drains shall be tied into the existing cast iron drain leader pipes. If any PVC drain leaders are found during the work, they shall be brought to the attention of the Architect and Owner immediately for resolution. Do not solder or seal cast ironbowls to PVC pipe.
3. Drain bowls shall be No Hub Bowls and be attached to the existing or new pipe with no hub fittings.
4. Provide and install roof drain marker flags at all drains on the roof.
5. Prior to the start of Work, Contractor shall inspect and verify the proper functioning of all roof drains, and identify those that are clogged or slow running. Contractor is to snake all drains at project completion to ensure that they are free flowing from roof level to the mains in the street. The Architect shall be notified three (3) days in advance of all snaking so that he can be on site to witness.

1.03 SUBMITTALS

A. Submit in accordance with Section 01300 - SUBMITTALS.

B. Contractor shall provide four copies of manufacturer's descriptive literature and data sheets for each of the following:

1. Roof drain assembly, including hangers and under deck clamps.
2. Lead and oakum for pipe to pipe and pipe to drain connections.
3. Manufacturer's literature on all products.

1.04 DELIVERY, HANDLING AND STORAGE

A. Contractor shall comply with all recommendations of the pipe manufacturer and of applicable Technical Reports of the Cast Iron Soil Pipe Institute for handling and installation.

B. All Work and materials shall be protected at all times. The Contractor shall make good all damage caused by his workmen either directly or indirectly. All pipe openings shall be closed with caps or plugs during installation. Equipment shall be tightly covered and protected against dirt, water, chemical or mechanical injury.

C. All Work shall be performed in accordance with Massachusetts State Plumbing Code

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and best practices of the trade.

D. The Contractor shall do all carting, handling and hoisting for his materials and equipment in a safe and satisfactory manner. Any damage resulting therefrom shall be repaired or paid for by this Contractor to the satisfaction of the parties concerned, at no additional cost to the Owner.

1.05 CODES, STANDARDS

A. All Plumbing Work shall be done in accordance with all applicable codes and standards.

1.06 COORDINATION

A. Coordinate all Work of this Section with other trades. Perform all Plumbing Work in a timely manner as not to delay other trades. This Plumbing Section shall coordinate all Work with the roofing and waterproofing trades to prevent exposure of the building to inclement weather at all times.

PART 2 – PRODUCTS

2.01 MATERIALS

A. All materials shall be selected so as to conform to all applicable local state and federal codes.

B. Standard replacement Roof Drains shall be Model #1010-C as manufactured by Jay R. Smith Manufacturing Co., Montgomery, Alabama or approved equal product to match existing. Provide all necessary accessories, including, but not limited to the following: Cast iron body, vandal proof Cast iron strainer/dome, gravel guard, under deck clamps, bolted clamping collar. Other type drains may be used if pre-approved by the Architect; however, if this requires the cutting of larger holes and reinforcing at decks, perform this Work at no additional cost to the Owner. Drain replacement parts under this section tobe furnished by the Contractor.

C. Pipe Joint: No Hub Fittings.

D. Pipe and Hangers: Piping 2 inches and larger shall be no-hub cast iron with rubber gaskets and mechanical couplings, supported with hangers at 5'-0" O.C. maximum.

E. Pipe Insulation: Preformed OCF Fiberglass #25 ASJ with vinyl jacket, or approved equal, minimum of 1 inch thick or as required by applicable codes. Provide mitered sections of same material, by the same manufacturer complete with joint tape to cover fittings.

F. Roof Drain Markers: Drain dome-mounted vertical fiberglass flag marker secured in aluminum socket in turn secured with pre-punched aluminum bracket configured for through-bolting to roof drain dome, by Roof Drain Marker Co., LLC, West Bridgewater, MA; (877) 571-6644; www.roofdrainmarker.com, or approved equal

1. Flag Marker: Pultruded fiber-reinforced polymer rod, 1/2 inch (12 mm) diameter by 48 inch (1219 mm) long, with reflective dual-colored reversible ends enabling marking of selected drains.
   a. Flexural Strength, minimum, ASTM D 790, 700,000 psi (689 MPa).
   b. Impact Strength, minimum, ASTM D 256: 40 ft-lb/in.
2. Marker Base: 1 by 1 by 4 inch (25 by 25 by 102 mm) extruded aluminum bar, ASTM B 209 (ASTM B 209M), with milled flag receiver, threaded flag set screw retainer,

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and threaded base.

3. Flag Bracket: 1 by 11 by 0.063 inch (25 by 25 by 1.60 mm) aluminum plate bracket, ASTM B 221 (ASTM B 221M).
4. Fasteners: Alloy Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

PART 3 – EXECUTION

3.01 INSTALLATION

A. The plumbing details intend to show only the scope of the design, and the Contractor shall be responsible for the correct installation of his Work in a manner satisfactory to the best practices of his trade and to complete the scope of this Work in all respects.

B. The Contractor shall also provide the necessary data and supervision for the provision of all openings in the structure, including bolt-hole templates, weights of equipment and manufacturer's recommendations for proper emplacement design.

3.02 DRAIN INSTALLATION

A. All replacement roof drains shall be recessed into the existing deck.

B. Install new roof drains in accordance with manufacturer's recommendations, ensuring all no-hub seal connections are proper to create a positive watertight connection with the new drain leader pipe including:

1. Flash in flange up to and around vertical drain body basses.
2. Install below-deck clamps.
3. Install clamping ring over raised basses and tighten clamping ring against metal flashing until secure.
4. Install strainer dome onto clamping ring and lock into place.

C. Install new cast iron strainers on all drains to fit and clamp into the existing or new bowls.

D. Install new cast iron pipe with hangers from structure per code 248 CMR.

E. Install pipe insulation from drain to existing insulation on existing pipe to remain.

F. Snake clear all existing drains from roof level to the mains prior to the start of construction and after the roof removal and replacement is complete and after all roof drain assemblies are properly installed and flashed. The Contractor shall report any non-functioning roof drains to the Owner prior to the start of construction. Contractor shall notify Architect three (3) days in advance so that he can be on site to witness snaking.

G. Contractor shall test all drain lines in accordance with the Commonwealth of Massachusetts Fuel Gas and Plumbing Codes as indicated in 248 CMR, uniform State Plumbing Code Section 2.04: Scope and Application. All costs incurred for the testing, inspection and repairs shall be included in the bid.

END OF SECTION

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SECTION 07 71 23 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 10, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

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1.02 WORK TO BE PERFORMED

A. Provide all the Manufactured Gutters and Downspouts work required to complete the work of the contract including all the Manufactured Gutters and Downspouts work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Manufactured Gutters and Downspouts work with all the other trades for the project. Provide all demolition and disposal work to complete the Manufactured Gutters and Downspouts work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished.

All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Manufactured Gutters and Downspouts work includes, but is not limited to:

1. Furnish and install pre-finished aluminum gutters and downspouts where indicated on the Drawings. Provide downspouts continuous full height of wall,securely attached, and install concrete splash blocks at base of all downspouts.

1.03 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.04 DESIGN REQUIREMENTS

A. Conform to SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on prefabricated components.

C. Samples: Submit two samples, minimum 6 inch long illustrating component design, finish, color, and configuration.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.

B. Prevent contact with materials that could cause discoloration, staining, or damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gutters and Downspouts:

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1. W.P. Hickman Company; Wind Resistant Gutter: www.wph.com.
2. ATAS International; www.atas.com
3. SAF Perimeter Systems; www.saf.com/persys
4. Or approved Equal

2.02 MATERIALS

A. Pre-Finished Aluminum Sheet: ASTM B209 (ASTM B209M); 0.050 inch thick.
   1. Finish: Plain, shop pre-coated with modified silicone coating.
   2. Color: As selected from manufacturer's standard colors.

2.03 COMPONENTS

A. Gutters: Profile as indicated. Match existing.

B. Downspouts: Profile as indicated. Match existing.

C. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Gutter Supports: Brackets with a twist at 18 inches on center with continuous stiffener bar at edge of gutter.

2.04 FABRICATION

A. Form gutters and downspouts of profiles and size indicated.

B. Fabricate with required connection pieces.

C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

D. Hem exposed edges of metal.

E. Fabricate gutter and downspout accessories; seal watertight.

2.05 FACTORY FINISHING

A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that surfaces are ready to receive work.

3.02 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

B. Slope gutters 1/4 inch per foot.

C. Set splash pans under downspouts.

END OF SECTION

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SECTION 07 72 00 ***FILE SUB-BID REQUIRED – ROOFING AND FLASHING***

ROOF ACCESSORIES

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. ROOFING AND FLASHING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein, in Sections 06 15 00, 07 01 50.19, 07 22 10, 07 31 10, 07 41 13, 07 54 00, 07 62 00, 07 62 10, 07 70 50, 07 71 23, 07 72 00 and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

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1.02 WORK TO BE PERFORMED

A. Provide all the Roof Accessories work required to complete the work of the contract including all the Roof Accessories work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Roof Accessories work with all the other trades for the project. Provide all demolition and disposal work to complete the Roof Accessories work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Roof Accessories work includes, but is not limited to:

1. Provide and install counter-balanced OSHA-compliant edge fall protection where indicated on the Drawings. Fall protection device shall consist of freestanding non-penetrating safety railing system including but not exclusive of pipe railings, uprights, bases, counterweights and fittings.
2. Provide and install roof hatches where indicated on the Drawings. Roof Hatches shall be thermally-broken aluminum type with integral curb.

1.03 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

1.04 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. OSHA 29 CFR 1926.500-503.

D. OSHA 29 CFR 1910.23.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Maintenance requirements.

C. Shop Drawings: Submit detailed layout developed for this project. Show dimensioned location and number for each type of roof accessory.

1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings.

D. Warranty Documentation:

1. Submit manufacturer warranty.

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2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

1.08 QUALITY ASSURANCE

A. Railings Structural Requirements:

1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 pounds (90719 g) applied in any direction on the top rail.

2. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 pounds (90719 g) applied to one square foot (8165 g/sm) at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.

PART 2 PRODUCTS

2.01 ROOF HATCHES, MANUAL AND AUTOMATIC OPERATION

A. Manufacturers - Roof Hatches:

1. Babcock-Davis: www.babcockdavis.com/sle.

2. Bilco Company: www.bilco.com/sle.

3. Dur-Red Products: www.dur-red.com.

4. Milcor, Inc: www.milcorinc.com.

B. Roof Hatches and Smoke Vents, General: Factory-assembled, thermally-broken aluminum frame and cover, complete with operating and release hardware.

1. Style: Provide flat metal covers unless otherwise indicated.

2. Mounting: Provide frames and curbs suitable for mounting on flat roof deck.

3. Thermally Broken Hatches: Added insulation to frame and cover; available in all manufacturer's standard, single leaf sizes; special sizes available upon request

4. For Ships Ladder Access: Single leaf; 30 by 54 inches.

C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.

1. Material: Mill finished aluminum, 11 gage, 0.0907 inch thick.

2. Insulation: Manufacturer's standard; 1 inch rigid glass fiber, located on outside face of curb.

3. Curb Height: 12 inches from finished surface of roof, minimum.

D. Metal Covers: Flush, insulated, hollow metal construction.

1. Capable of supporting 40 psf live load.

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2. Material: Mill finished aluminum; outer cover 11 gage, 0.0907 inch thick, liner 0.04 inch thick.
3. Insulation: Manufacturer's standard 1 inch rigid glass fiber.
4. Gasket: Neoprene, continuous around cover perimeter.

E. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.

1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
2. Hinges: Heavy duty pintle type.
3. Hold open arm with vinyl-coated handle for manual release.
4. Latch: Upon closing, engage latch automatically and reset manual release.
5. Manual Release: Pull handle on interior.
6. Locking: Padlock hasp on interior.

2.02 NON-PENETRATING ROOFTOP ASSEMBLIES

A. Manufacturers - Non-Penetrating Rooftop Assemblies:

1. Kee Safety, Inc.; Unrestrained KGPVC10U (with CB4PVC end uprights not attached to the building); www.keesafety.com
2. Garlock Safety Systems; RailGuard 200; www.railguard.net
3. or Approved Equal.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Penetrating Rooftop Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly.

1. Freestanding counterweighted guardrail system with 42 inch minimum height and to withstand a minimum load of 200 lb in any direction to the top rail per OSHA Regulation 29 CFR 1910.23
2. Design Loadings and Configurations: As required by applicable codes.
3. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
4. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
5. Rails and Posts: Galvanized Tube, 12 gauge, 1-1/2 inches, 1.90 inches diameter
6. Finish: Polyester factory-applied spray coating.
7. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.

C. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.

1. Bases: High density polypropylene.
2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

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PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing weather integrity.

B. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 foot pounds (39 N-m) of torque.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 72 00

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SECTION 07 92 00
FILE SUB-BID REQUIRED – WATERPROOFING, DAMPROOFING, AND CAULKING
JOINT SEALANTS

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. WATERPROOFING, DAMPROOFING AND CAULKING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein 07 92 00, and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

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1.02 WORK TO BE PERFORMED

A. Provide all the Joint Sealants work required to complete the work of the contract including all the Joint Sealants work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Joint Sealants work with all the other trades for the project. Provide all demolition and disposal work to complete the Joint Sealants work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-Contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Joint Sealants work includes, but is not limited to:

1. Removal and disposal of all existing sealants and joint backing at windows scheduled to be removed are asbestos-containing and shall be the responsibility of the GENERAL BIDDER.
2. Provide and install all sealants and joint backing as indicated on the Drawings and Specifications, and to provide a complete watertight installation as per good construction practice.

1.03 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.04 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2006 (Reapproved 2011).

B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.

C. ASTM C834 - Standard Specification for Latex Sealants; 2010.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

E. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2000 (Reapproved 2011).

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

G. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.
3. Substrates that product is known to satisfactorily adhere to and with which it is

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compatible.

4. Substrates the product should not be used on.
5. Substrates for which use of primer is required.
6. Sample product warranty.
7. Certification by manufacturer indicating that product complies with specification requirements.

C. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

B. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.

1. Adhesion Testing: In accordance with ASTM C794.
2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver to manufacturer sufficient samples for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

C. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.

1. Sample: At least 18 inch long.
2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.
4. Record results on Field Quality Control Log.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nonsag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.

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1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
2. Dow Corning Corporation: www.dowcorning.com/construction.
3. Pecora Corporation: www.pecora.com.
4. Tremco Global Sealants: www.tremcosealants.com.
5. Or Approved Equal.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
   a. Wall expansion and control joints.
   b. Joints between door, window, and other frames and adjacent construction.
   c. Joints between different exposed materials.
   d. Openings below ledge angles in masonry.
   e. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames, trim, and adjacent construction.
   b. Other joints indicated to be sealed on the Drawings and in other Sections.
3. Do not seal the following types of joints.
   a. Intentional weepholes.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag non-staining silicone sealant, unless otherwise indicated.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.

2.03 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 50 percent, minimum.
2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Color: To be selected by Architect from manufacturer's standard range.

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5. Cure Type: Single-component, neutral moisture curing.
6. Products:
   a. Pecora Corporation; 864NST Low Modulus Architectural Silicone Sealant - Class 50: www.pecora.com.
   b. Dow Corning Corporation; 795 Silicone Building Sealant: www.dowcorning.com.
   c. Or Approved Equal.

B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multicomponent; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Products:
   a. Pecora Corporation; DynaTrol I-XL General Purpose One Part Polyurethane Sealant: www.pecora.com.
   b. Or Approved Equal.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: To be selected by Architect from manufacturer's standard range.
2. Products:
   a. Pecora Corporation; AC-20 + Silicone Acrylic Latex Caulking Compound: www.pecora.com.
   b. Or Approved Equal.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

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3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:

1. Width/depth ratio of 2:1.
2. Neck dimension no greater than 1/3 of the joint width.
3. Surface bond area on each side not less than 75 percent of joint width.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Non-sag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

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SECTION 08 51 13

ALUMINUM WINDOWS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Aluminum Windows work required to complete the work of the contract including all the Aluminum Windows work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Aluminum Windows work with all the other trades for the project. Provide all demolition and disposal work to complete the Aluminum Windows work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Aluminum Windows work includes, but is not limited to:

1. Provide labor, materials and equipment necessary to complete the Replacement Window work, and without limiting the generality thereof include:
2. Field observations and measurements of existing openings and conditions and furnishing of shop drawings and product submittals.
3. Removal of scheduled existing window systems in their entirety and existing adjacent building finishes and materials required for the removal of the windows (including removal and legal disposal of asbestos containing, lead-containing, and presumed pcb materials as identified in Section 02 82 00).
4. Removal of other existing work as required for the proper installation and operation of the new units.
5. Removal from site and legal disposal of all removed materials, debris, packaging, banding and all other surplus materials and equipment.

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6. Treated wood blocking, fillers and nailers as required for secure installation. Bidders shall survey conditions of existing sills and jambs prior to bidding.
7. Install continuous flexible membrane flashing at entire perimeter of all window openings.
8. Install aluminum sill pan flashings with panned end dams, and other waterproofing and vapor/air barrier materials at window openings indicated on the drawings.
9. Provide new thermally-broken aluminum windows, types as specified herein and on the drawings, together with necessary fixed and operable sash, insulated metal panels, mullions, receptors, panning, expanders, continuous clips and trim, operating hardware, installation hardware and all other accessories as detailed and required for a complete weatherproof assembly.
10. Include exterior screens at all hopper windows and interior screens at all awning windows with wicket to access the handle.
11. Install low-rise spray-foam insulation in all exterior masonry cavity walls that are exposed after the window, door and storefront systems are removed.
12. Install mineral wool insulation in all perimeter window, door and storefront shim spaces and between receptors or panning, and the window or storefront frames at the jambs and heads.
13. Sealing of entire interior and exterior window systems at all intersections of metal-to-metal window system joints including sash frame, panning, trim, receptors and mullions.
14. Furnishing and delivering of extra materials as specified.
15. Furnish a warranty for all completed work as specified.

1.03 SECTION INCLUDES

A. Factory glazings.

B. Operating hardware.

C. Insect screens.

1.04 RELATED REQUIREMENTS

A. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.

1.05 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

F. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.

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G. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.

H. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

I. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

L. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).

M. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

N. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

1.06 ADMINISTRATIVE REQUIREMENTS

A. General: Coordinate the work of this Section with the respective trades responsible for installing interfacing and adjoining work for proper sequence of installation, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work.

B. Contractor shall relocate loose furniture as required for contractor to perform work. Contractor shall not move books, periodicals, computers or other equipment or circulating library materials, but shall ensure that all materials and finishes are protected until the work is completed.

C. Sequencing:

1. Field Measurements:
   a. Take field measurements before preparation of shop drawings and fabrication to ensure proper fitting of Work.
   b. Allow for adjustments within specified tolerances wherever taking of field Sequence installation of installation of windows with fluid-applied membrane. Closely coordinate with installation of abutting materials, including open-cell and closed-cell spray insulation, wood block1ng and masonry repairs.

1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.

C. Shop Drawings: Indicate opening dimensions, enlarged elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations, and installation requirements. Include all Details indicating system components and all surrounding conditions and items to which the work

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of this Secion will be attached, with dimensions. Shop Drawings must be certified by a Massachusetts Registered Professional Engineer.

D. Submit one sample of operating hardware.

E. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:

1. Evidence of AAMA Certification.
2. Evidence of WDMA Certification.
3. Evidence of CSA Certification.
4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

F. Certificates: Certify that windows meet or exceed specified requirements.

G. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

H. Manufacturer's sample warranties.

1. Schedule: A complete schedule of windows, to be furnished hereunder, coordinated with the schedule contained in the Contract Drawings, submitted for record only to Architect.

1.08 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.

B. Manufacturer, Installer and Superintendent Qualifications: Company specializing in fabrication of commercial aluminum windows of types required, with not fewer than five years of documented experience.

C. DO NOT EXECUTE CONTRACT WITH WINDOW FABRICATOR OR PLACE ORDER FOR WINDOWS WITHOUT RECEIVING ALL OF THE ARCHITECT'S APPROVALS.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of AAMA CW-10.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.10 FIELD CONDITIONS & MEASUREMENTS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Check dimensions of openings in the actual framing work, by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress as directed by the Contractor.

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1.11 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Contractor shall correct defective Work within a two (2) year period after the Date of Substantial Completion.

C. Provide ten (10) year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN - AW PERFORMANCE CLASS WINDOWS

A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 having Performance Class of AW, and Performance Grade at least as high as specified design pressure.

B. Projected, Face of Sash and Frame in Approximately Same Plane:

1. Basis of Design: Kawneer, Traco Series NX-3800 fixed and NX-3400 hopper and NX-3500 awning.

C. Other Manufacturers: Provide either the product identified as "Basis of Design" above or an equivalent product of one of the manufacturers listed below:

1. EFCO, a Pella Company, 325X Series: www.efcocorp.com.
2. Wausau Window and Wall Systems; www.wausauwindow.com.
3. Graham Thermal Products Model GT-6200 fixed and GT-6200 operable..
4. Or Approved Equal.

2.02 MANUFACTURERS

A. Aluminum Windows:

1. EFCO, a Pella Company; Series 325X fixed and hopper: www.efcocorp.com.
2. Kawneer Company; Series NX 3800 fixed, NX 3400 hopper: www.kawneer.com/kawneer/north_america/en/info_page/home.asp
3. Wausau Window and Wall Systems: www.wausauwindow.com.
4. Graham Thermal Products Model GT-6200 fixed and GT-6200 operable.
5. Or Approved Equal.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 WINDOWS

A. Windows: Tubular aluminum sections, factory fabricated, factory finished, thermally broken, vision glass, related flashings, anchorage and attachment devices. AAMA Designation: AP-AW90

1. Frame Depth: 3-1/4" minimum frame depth; extruded aluminum with dual strut glass reinforced polyamide nylon thermal break frame; finish factory-applied; frames and sash factory-assembled. Provide weeps in glazing pockets and internal heel bead seal.
2. Operable Units: Double weatherstripped.

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3. Provide units factory glazed.
4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
5. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
6. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Performance Requirements:

1. Design and size windows to withstand the following load requirements, when tested in accordance with ASTM E330 using test loads equal to 1.5 times the design wind loads with 10 second duration of maximum load. Anchorage to transfer loads to existing structural elements.
   a. Design Wind Loads: Comply with requirements of ASCE 7
   b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Windows shall conform to AW-PG80-AP specifications in AAMA/WDMA/ CSA 101/I.S.2/A440-05 when tests are performed on a 60" x 36" test unit with the following results:
   a. Air Infiltration: Maximum 0.10 cfm/ft² when tested per ASTM E 283 at a static air pressure difference of 6.24 psf (50 mph).
   b. Water penetration: No uncontrolled water leakage when tested per ASTM E 331 at a static air pressure difference of 15 psf.
   c. Uniform Load Deflection: no more than L/175 when tested per ASTM E330 at a static air pressure difference of 80 psf.
   d. Uniform Structural Load: No glass breakage or permanent damage to fasteners, and maximum 0.2 percent permanent deformation of the span of any frame member when tested per ASTM E 330 at a static air pressure difference of 120 psf.
   e. Forced Entry: No entry shall be achieved when tested to ASTM F 588 standard test methods for measuring the forced entry resistance of window assemblies, excluding glazing impact. Unit shall pass sequence of: Type A; Grade10
3. Thermal performance in accordance with AAMA 1503 and NFRC 200-2004, for a 60" x 96" nominal sizes window unit.
   a. U-Factor for fixed windows shall be not more than 0.38 and for operable windows not more than 0.45. Value based on thermal simulation for a 1" Laminated IGU with Softcoat low-e, warm edge spacer and argon fill.
   b. Solar Heat Gain Coefficient shall be: 0.19. Value based on thermal simulation for a 1" IGU with 3/16" Clear lites, Softcoat low-e, warm edge spacer and argon fill.
4. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
5. Condensation Resistance Factor: Measured in accordance with AAMA 1503.
6. Water Leakage: None, when measured in accordance with ASTM E331 and E 547.

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7. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly.
8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system.

C. Fixed, Non-Operable Type:

1. Construction: Frame shall be constructed of extruded aluminum with 2 thermal struts, consisting of glass reinforced polyamide nylon, mechanically crimped in raceways extruded in the exterior and interior extrusions. Corners shall be double keyed, staked and sealed.. Sash shall be reglazable without dismantling or removing the sash and without the use of special tools. Sash and frame shall be dry glazed to simplify reglazing. Exterior of sash and frame shall contain a continuous preset EPDM gasket. Interior of frame and sash shall contain a removable wedge gasket.
2. Glazing: types as indicated on the drawings and scheduled. Refer to section 08 80 00 - Glazing

D. Outswinging Awning Type:

1. Construction: same type as fixed, non-operable type.
2. Provide interior mounted screens with wickets to access operable hardware.
3. Glazing: Type IG-1; Refer to section 08 80 00 - Glazing.

E. Inswinging Hopper Type:

1. Construction: same type as fixed, non-operable type.
2. Provide heavy-duty exterior mounted stainless steel insect screens.
3. Glazing: Type IG-1; Refer to section 08 80 00 - Glazing.

2.04 COMPONENTS

A. Glazing: As specified in Section 08 80 00, and as scheduled on the drawings.

B. Reinforced Mullion: 4 inch profile of extruded thermally-broken 3-piece aluminum with integral reinforcement of shaped steel structural section.

C. Sills:.062 inch thick, brake formed aluminum; sloped for positive wash; fit under sash leg to turn up at inside inch beyond wall face; one piece full width of opening and extended where indicated on the drawings sealed, jamb angles to terminate sill ends.

D. Insect Screen Frames: Rolled Extruded tubular aluminum frame of rectangular sections, color to match window frames; fit with adjustable hardware; nominal size similar to operable glazed unit. Screen track is mounted on exterior. Extruded frame is side loaded into track and finished to match exterior window finish. Corners are mitered and gussets are used to assemble. Provide wicket on outward swinging awning windows to provide access to the operating hardware.

E. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to achieve effective weather seal.

F. Fasteners: Stainless steel.

G. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

H. Sealant and Backing Materials: As specified in Section 07 90 05.

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2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Material: Aluminum; nominal .062 inch (1.6 mm) wall; with exposed surfaces finished to match window color and finish performance; concealed fasteners; required weather seals; designed for unrestricted expansion and contraction. All aluminum brake metal fastened with continuous metal cleat shall be .040 inch, with .063 inch cleat, minimum. All brake metal without continuous cleat shall be .063 inch, minimum.

C. Interior Trim: Provide continuous two-piece aluminum snap-trim around the entire interior window perimeter.

D. Mullions: Provide thermally broken mullions as indicated on the drawings.

2.06 HARDWARE

A. Operator: Heavy-Duty non-keyed Lever action handle fitted to projecting sash concealed hinge set arms with limit stops.

B. Assemble insect screen frames with mitered and reinforced corners. Secure wire mesh tautly in frame. Fit frame with four, spring loaded steel pin retainers.

C. Double weatherstrip operable units.

D. Factory glaze window units.

2.07 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

B. Finish Color: As selected by Architect from manufacturer's standard range.

C. Pretreatment: Five-stage; zinc chromate conversion coating.

D. Application: Electrostatic spray and oven bake by approve applicator.

2.08 MEMBRANE FLASHING

A. Self-adhering, flexible air and vapor barrier membrane flashing: Tremco ExoAir III, or approved equal.

2.09 INSULATION

A. Unfaced Mineral Wool BATT insulation to fill all voids between the window or storefront units and openings and as detailed on the Drawings: ROXUL ComfortBatt; or approved equal.

B. Low-Rise spray Foam insualtion at the full perimeter of the openings and at all exposed wall cavities: HILTI CF812, or approval equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.

B. Verify openings are in tolerance, plumb, level and provide for secure anchorage in accordance with approved shop drawings.

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3.02 INSTALLATION

A. Install windows in accordance with manufacturer's instructions and approved shop drawings with skilled craftspeople who have a successful history of installing windows in similar applications for a minimum of five years. Do not install windows until unsatisfactory conditions have been corrected.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install sill and sill end angles.

E. Set subsill and window in a bed of sealant.

F. Apply sealant and backer rod per sealant manufacturer's recommendations at joints. Wipe off excess, and leave exposed sealant surfaces clean and smooth.

G. Verify that weeps are not obstructed. Remove any sealant that could impede the flow of water.

H. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other non-compatible materials by applying bituminous paint, zinc chromate primer or other suitable insulating material.

J. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.

K. Install operating hardware not pre-installed by manufacturer.

L. Install perimeter sealant in accordance with requirements specified in Section 07 90 05.

3.03 TOLERANCES

A. Maximum Variation from Level or Plumb: 1/16 inches every 3 ft non-cumulative or 1/8 inches per 10 ft, whichever is less.

3.04 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 windows. Contractor shall include the cost for the field quality control in his bids

B. Perform air and water testing on complete window assemblies, at various stages of the installation, in accordance with SECTION 019115. The BECxA shall direct and observe all window tests and the manufacturers technical representative shall be present for all window testing.

C. Submit results of ASTM E1105 and ASTM E783 for the specified and approved windows.

D. Submit results of AAMA 501.2 for the specified and approved storefronts.

E. Remove, repair or replace windows where test results indicate that they do not comply with the specified requirements.

F. 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.

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3.05 ADJUSTING

A. Adjust windows and hardware for smooth operation and secure weathertight closure, and leave windows clean and free of construction debris.

3.06 CLEANING

A. Remove protective material from factory finished aluminum surfaces.

B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

D. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

3.07 PROTECTION

A. Protect finished work to ensure that windows will be without damage or deterioration at the time of substantial completion, and under the provisions of Section 01 50 00- TEMPORARY FACILITIES AND CONTROLS.

1. The manufacturer shall advise the Contractor of protective treatment and other precautions required by him through the remainder of construction to ensure that the work of this Section will be without damage or deterioration at the time of Substantial Completion of the Contract.
2. Protect glass from breakage immediately upon installation. Use streamers or ribbons suitably attached to framing and held free of the glass. Do not apply warning markings directly to the glass.
3. Cover glass to protect it from activities that might abrade the glass surface.

B. Repair Broken Glass:

1. Replace in kind and thickness all glass breakage caused by the work performed under this Section, and bare all costs therefor.
2. Prior to Date of Substantial Completion, the Contractor shall replace in kind and thickness all glass breakage, caused by the work, weather, vandalism, accidents, negligence or any other reasons, with the costs being borne by the trade at fault, or the Contractor, as applicable.

END OF SECTION 08 51 13

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SECTION 09 90 00 ***FILE SUB-BID REQUIRED – PAINTING***

PAINTING AND COATING

PART 1 GENERAL

1.00 FILE SUB-BIDS

A. PAINTING is stipulated as a Filed Sub-Bid on the FORM FOR GENERAL BID.

B. All sub-bids shall be submitted on the FORM FOR SUB-BID furnished by the Awarding Authority as required by Section 44G of Chapter 149 of the General Laws, as amended.

C. Sub-bids must be filed with the Awarding Authority in a sealed envelope, before the time stipulated on the ADVERTISEMENT, on the date stipulated in the ADVERTISEMENT.

D. Specific information relating to sub-bidders is set forth in the CONTRACT DOCUMENTS under the heading, "INSTRUCTIONS TO BIDDERS", and the attention of the sub-bidders is directed thereto.

C. The work to be completed by the Filed Sub-Bidder for the work of this section as described herein 09 90 00, and on the Drawings: G0-01, G0-02, L1-01, AD1-03 through AD1-05, AD2-01 through AD2-04, A1-00 through A1-06, A2-01 through A2-04, A4-01 through A4-06, A5-01 through A5-09, A6-01 through A6-03, A8-01, A8-02, A9-01, S1-00, S1-01, and S2-01.

1. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section. The listing of Contract Drawings above does not limit Filed Subcontractor's responsibility to determine full extent of work of this Section as required by all Drawings listed in the Drawing List on the Drawing Title Sheet, as modified by Addenda.

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Painting and Coating work required to complete the work of the contract

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including all the Painting and Coating work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all accessories. Coordinate the Painting and Coating work with all the other trades for the project. Provide all demolition and disposal work to complete the Painting and Coating work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Painting and Coating work includes, but is not limited to:

1. Prepare, prime and paint all interior wood stools and trim, at the windows scheduled to be removed and reinstalled where indicated ion the Drawings. .
2. Touch-up paint all damaged surfaces to remain.

1.03 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. Do Not Paint or Finish the Following Items:

1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
2. Items indicated to receive other finishes.
3. Items indicated to remain unfinished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Floors, unless specifically so indicated.
6. Glass.
7. Concealed pipes, ducts, and conduits.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

1.5 SUBMITTALS

A. Submit Manufactures Literature on each product, including VOC information.

B. Provide Mock-up of each condition and paint color.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

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B. Paints:

1. Glidden Professional, a product of PPG Architectural Coatings: www.gliddenprofessional.com.
2. Benjamin Moore & Co: www.benjaminmoore.com.
3. Sherwin-Williams Company: www.sherwin-williams.com.
4. Or approved equal.

C. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.

1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Supply each coating material in quantity required to complete entire project's work from a single production run.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

1. Concrete Masonry: Interior/Exterior Latex Block Filler; MPI #4.
2. Steel -- Shop Primer: Interior/Exterior Quick Dry Alkyd Primer for Metal; MPI #76.

C. Volatile Organic Compound (VOC) Content:

1. Provide coatings that comply with the most stringent requirements specified in the following:
   a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   b. Architectural coatings VOC limits of the State in which the Project is located.
2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Colors: Selected by the Manufactures range and Approved by Owner to match existing Adjacent colors.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - All Exterior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including primed metal.

1. Preparation as specified by manufacturer.
2. Two top coats and one coat primer recommended by manufacturer.

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B. Paint ME-OP-2A - Ferrous Metals, Primed, 2 Coat:

1. Remove all rust and prepare surfaces for painting.
2. Primer: Apply zinc-rich rust-inhibitive primer for marine and offshore applications recommended by top coat manufacturer; SeaGuard Universal Primer by Sherwin Williams or approved equal. Provide five (5) dry mil thickness, minimum.
3. Intermediate Coat: Modified epoxy phenalkamine, formulated specifically for immersion and atmospheric service in marine and industrial environments; Dura-Plate 235 Multi-Purpose Epoxy by Sherwin Williams or approved equal. Provide eight (8) dry mil thickness, minimum.
4. Finish Coat: High performance, high-gloss acrylic polyurethane; Acrolon Ultra by Sherwin Williams or approved equal. Provide five (5) dry mil thickness, minimum.

2.04 PAINT SYSTEMS – INTERIOR

A. Paint I-OP - All Interior Surfaces Indicated to be Painted or receive touch-up, Unless Otherwise Indicated: Including gypsum board and wood.

1. Two top coats and one coat primer.
2. Primer(s): As recommended by manufacturer of top coats.

B. Paint WI-OP-2L - Wood, Opaque, Latex, 2 Coat:

1. One coat of latex primer sealer.
2. Semi-gloss: One coat of latex enamel.

C. Paint CI-OP-2A - Concrete/Masonry, Opaque, Alkyd, 2 Coat:

1. One coat of block filler.
2. Semi-gloss: One coat of alkyd enamel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

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C. Remove or repair existing coatings that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

I. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

J. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

K. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

M. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.03 APPLICATION

A. Remove louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

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3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

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SECTION 10 29 00

BIRD DETERRENT SYSTEM

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Bird Deterrent System work required to complete the work of the contract including all the Bird Deterrent System work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all hardware, finishes, and accessories. Coordinate the Bird Deterrent System work with all the other trades for the project. Provide all disposal work to complete the Bird Deterrent System work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Bird Deterrent System includes, but is not limited to:

1. Provide netting at all cupola louver openings. Carefully cut and install netting at each portion of the elevation shown to appear as unobtrusive as possible.

1.04 QUALITY ASSURANCE

A. Contractor Qualifications:

1. Must have a minimum of five (5) years experience in the installation and supervision of passive bird control systems.

2. Supervisory personnel shall have not less than 3 years experience in supervising this type of work. All apprentices be under the direct supervision of an experienced supervisor.

3. Contractor shall keep at the project site, during the period when work is being performed, a competent superintendent working foreman satisfactory to the Contracting Officer.

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B. Manufacturers: Materials shall be obtained only from Birdmaster, Woburn, MA who will send a technical representative to the project site, for the purpose of advising the Contractor of the procedures and precautions for the use of the materials.

1.05 SUBMITTALS

A. Shop drawings: elevation showing layout of anchors and details showing typical and critical connections for the passive bird control system. Show sections of each condition.

B. The Contractor shall submit to the Owner and Architect three (3) samples of specified anchors for approval, 3'-0" long sample of stainless steel wire, and 2'-0"x2'-0" sample of netting.

C. Prior to installation of the passive bird control system, install a sample for approval. Work will proceed after the sample been approved by the Owner and Architect. The approved sample shall be the standard for all work.

1.06 JOB CONDITIONS

A. All material shall be delivered, stored and handled so as to prevent deterioration or the intrusion of any foreign matter. Packaged material shall be delivered and stored in the original packages. Materials in broken packages or showing evidence of damage will be rejected.

B. Materials shall not be stored in such a matter as to damage or place undue stress on the existing structure or the roof membrane of the building.

C. The Contractor shall take the necessary precautions to meet the following conditions:

1. Store all material off ground to prevent contamination by mud, dust or materials likely to cause staining or other defects.

2. Cover material to protect from elements and neglect.

D. All materials received at the site shall be unloaded with care and handled to avoid any damage or contamination's of the materials.

E. All materials shall be stored, covered and protected from the weather, and kept at temperatures in strict compliance with the manufacturer's recommendations. The locations for storage shall be approved by the Owner.

F. Where conditions are uncovered that are not anticipated by the Drawings and Specifications, the Contractor shall notify the Architect immediately before any repairs are initiated.

PART 2 - PRODUCTS

2.01 PASSIVE BIRD CONTROL SYSTEM

A. Passive bird control system components.

1. 1/16" diameter cable 7x7 twine - stainless steel

2. 3/16" stainless steel netting framework

3. 3" stainless steel turnbuckles

4. 10/4 7/8" square mesh netting twined and knotted - vertical application.

5. 10/9 2" square mesh netting twined and knotted- Horizontal application.

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6. 1x1/4" long stainless steel screweye with 3/16" plastic anchors.

B. All products as manufactured and installed by BirdMaster, Woburn, MA. (781) 932-0022. No substitutes.

PART 3 - EXECUTION

3.01 PREPARATION

A. Before installation commences in a particular area of the building, the Contractor shall notify the Architect, who will inspect the work area with the Contractor or the Contractor's representative. At this time, the Architect will determine the scope of work and review the locations of the bird deterrent system.

3.02 INSTALLATION

A. Install system according to manufacturer's specifications.

3.03 PERFORMANCE

A. Failure of the system to be accrued to the secured, improper installation or visible damage to netting will be considered failure of materials or workmanship. Repair or replace system in areas of such failures to the satisfaction of the Architect.

END OF SECTION

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SECTION 23 00 00

TEMPORARY MECHANICAL DISCONNECTS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that the equipment and materials to be furnished complete in every respect, and that this Contractor shall provide all items needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Temporary Mechanical Disconnect work required to complete the work of the contract including all the Temporary Mechanical Disconnect work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all hardware, finishes, and accessories. Coordinate the Temporary Mechanical Disconnect work with all the other trades for the project. Provide all demolition and disposal work to complete the Temporary Mechanical Disconnect work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Temporary Mechanical Disconnect Work includes, but is not limited to:

1. Temporary removal of all existing louvers, vents, fans, ducts and other mechanical devices (to remain) to accommodate the work, and re-installation and reconnection of all units.

2. Coordinate any removal of equipment from service with the Owner's representative to minimize disruptions to the building operations.

PART 2 – PRODUCTS

2.01 GENERAL

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A. All fixtures, bolts and lag bolts shall be non-magnetic stainless steel.

PART 3 – EXECUTION

2.02 REMOVAL

A. Air Conditioning and Mechanical units shall be disconnected and removed if their presence is in conflict with the removal or installation of the E.I.F.S., window or roof systems.

B. If air conditioning or mechanical units are disconnected and removed, they shall be stored on site in a protected enclosure to protect them from any damage, inadvertent or otherwise. The Contractor shall be responsible for ensuring that all mechanical units are in proper working order.

C. If any air conditioning or mechanical units are encountered which are not in proper working order, the Architect and the Owner shall be notified immediately.

2.03 MOUNTING

D. The air conditioning and mechanical units shall be re-mounted to their original curbs or mounting frames and reconnected, tested, and inspected by the Architect or Owner before the area is completed.

END OF SECTION

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SECTION 26 00 00

TEMPORARY ELECTRICAL DISCONNECTS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that the equipment and materials to be furnished complete in every respect, and that this Contractor shall provide all items needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

E. Work described here in shall be interpreted as work to be done by the electrical subcontractor.

1.02 DESCRIPTION OF WORK

A. Provide all the Electrical work required to complete the work of the contract including all the Electrical work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all hardware, finishes, and accessories. Coordinate the Electrical work with all the other trades for the project. Provide all demolition and disposal work to complete the Electrical work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each sub-contractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.

B. Electrical Work includes, but is not limited to:

1. Scope of the electrical work under this section is associated with the disconnecting, removal and reconnection (including extension) of existing electrical equipment and wiring to accommodate the work of the Contract. The electrical equipment and wiring includes but is not limited to the following equipment types: surface mounted exterior wall lights, through-wall fans and louvers, and rooftop equipment.
2. Coordinate any disconnection of equipment from service with the Owner's representative to minimize disruptions to the building operations.
3. Remove existing electrical boxes on existing rooftop units as noted on the drawings. Disconnect and install new electrical boxes furnished by the Owner for the existing rooftop HVAC units.

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PART 2 – MATERIALS – NOT USED

PART 3 – EXECUTION

3.01 ELECTRICAL

A. Prior to the removal of any piece of unit ventilation equipment the Electrical Contractor shall test the equipment to ensure it is functioning properly and report any problems to the general contractor and owner.

B. The Electrical Contractor shall coordinate all interruptions of power to unit ventilator equipment with the Owner prior to any work.

C. The Electrical Contractor shall disconnect and remove the existing unit ventilator feeder and control wiring and reconnect same as required by job condition and window installation.

D. The Electrical Contractor shall replace existing equipment, disconnecting means that are in poor condition, and rewiring equipment needed by job conditions.

E. After the existing equipment and wiring has been reconnected the Electrical Contractor shall test the equipment to ensure it is functioning properly and report any problems to the General Contractor and Owner.

END OF SECTION

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SECTION 32 91 00

LANDSCAPING REPAIR

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.

D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Provide all the Landscaping Repair Work required to complete the work of the contract including all the Landscaping Repair Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way, with all reinforcing, pinning, and finishes. Coordinate the Landscaping Repair Work with all the other trades for the project. Provide all demolition and disposal work to complete the Landscaping Repair Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, and each Subcontractor for the entire project so that all the work can be properly and completely performed.

B. Landscaping Repair Work includes, but is not limited to, replacing and planting of trees, shrubs and grass, including mulching, staking and related planting procedures of landscaping items disturbed or displaced by the work or damaged during construction.

1. Preparation of final sub-grades in planted areas.
2. Furnishing topsoil at areas to be planted.
3. Planting mixes
4. Protection, maintenance and guarantee of plant materials.
5. Existing tree protection and care

1.03 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. SECTION 02 41 00, SELECTIVE DEMOLITION

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1.04 QUALITY ASSURANCE

A. Comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged.

B. Comply with sizing and grading standards of the latest edition of "American Standard for Nursery Stock". A plant shall be dimensioned as it stands in its natural position.

C. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a minimum of 2 years.

1.05 SAMPLES

A. Submit the following samples in accordance with the requirements of GENERAL CONDITIONS and SUPPLEMENTAL GENERAL CONDITIONS.

1. Mulch
2. Anchors
3. Wire
4. Hose
5. Turnbuckles and cable clamps
6. Wrapping
7. Topsoil

B. Provide samples for testing as required by Architect.

PART 2 – PRODUCTS

2.01 TOPSOIL

A. Topsoil shall be a fertile, friable natural topsoil not excessively acid or alkaline and tree of toxic substances harmful to plant growth. Topsoil shall be without admixture of subsoil and free from clay lumps, stumps, roots, debris, stones, or other similar substances 2" or more in diameter.

1. It shall be obtained from a well-drained arable site with a history of good plant growth. Submit sample for approval by the Landscape Architect.

2.02 SLUDGE FERTILIZER

A. Sludge fertilizer shall be an organic activated, granular, heat dried sludge and shall contain the following minimum percentages by weight: 6% Nitrogen, 4% Phosphoric Acid, and other nutritious basic elements. The sludge fertilizer shall be delivered as specified in standard size bags, showing weight analysis and name of processor and shall be stored in a weatherproof storage place.

2.03 COMPOSTED COW MANURE

A. Manure shall be a derivative of cattle manure which has undergone a period of composting rendering it into a crumbly, odor free, weed free material containing beneficial natural soil bacteria. It shall be free of harmful chemicals and other injurious

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substances. Manure shall be free of refuse of any kind and shall not contain more than 25% of straw, shavings, leaves, or other material. Manure shall not be more than 2 years nor less than 9 months old.

B. A composition of peat moss or peat humus to which has been added dehydrated manure such as bovine in the proportion of 100 pounds of dehydrated manure per cubic yard of peat, may be substituted for manure as specified above.

2.04 BONE MEAL

A. Bone meal shall be commercial raw bone meal, finely ground, having a minimum analysis of 4% nitrogen and 20% phosphoric acid.

2.05 WATER

A. Water will be furnished by Owner on the site. Hose and other watering equipment shall be furnished by Contractor.

2.06 PLANT MATERIALS

A. Contractor shall replace in kind and plant all plants or lawn damaged or killed during construction. No substitutions will be permitted. All plants shall be nursery grown unless specifically authorized to be collected.

B. Plant shall be in accordance with the USA Standard for Nursery Stock of the American Association of Nurserymen.

C. All plants shall be typical of their species or variety and shall have a normal habit of growth and be legibly tagged with the proper name. All plants shall have been grown under climatic conditions similar to those in the locality of the site of the project under construction, or have been acclimated to such conditions for at least 2 years. Trees shall have straight trunks and all abrasions and cuts shall be completely culled over.

D. The root system of each shall be well provided with fibrous roots. All parts shall be sound, healthy, and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs or larvae.

E. All plants must be moved with the root systems as solid units with balls of earth firmly wrapped with burlap. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during the process of planting or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The plants and balls shall remain intact during all operations. All plants shall be freshly dug. No plants from cold storage or previously heeled-in will be accepted. All plants that cannot be planted at once must be heeled-in by setting in the ground and covering the balls with soil and then watering.

F. The height of the trees (measure from the crown of the roots to the tip of the top branch) shall be not less than that of the tree being replaced. The branching height for shade trees next to walks shall be 7'. This may be obtained by pruning after delivery if this does not ruin the shape or form of the trees or cause unsightly scares. All cuts shall be shellacked. The trunk of each tree shall be a single trunk growing from a single unmutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. The trunk shall be free from sunscald,

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frost cracks, or wounds resulting from abrasions, fire or other causes. No pruning wounds shall be present having a diameter exceeding 2" and such wounds must show vigorous bark on all edges. No trees which have had their headers cut will be accepted.

G. Shrubs shall meet the requirements for spread of height of the shrub being replaced. The measurements for height are to be taken from the ground level to the average height of the shrub and not to the longest branch. The thickness of each shrub shall correspond to the trade classification No. 1.

1. Single stemmed or thin plants will not be accepted. The side branches must be generous, well-twigged, and the plant as a whole well branched to the ground. The plants must be in a moist vigorous condition, free from dead wood, bruises or other root or branch injuries.

2.07 MULCH

A. Mulch material shall be softwood hemlock bark shredded into fibrous pliable slices generally not exceeding 1/2" in width.

1. Mulch shall be 98% organic matter with the pH range 3.5 to 4.5. Moisture content of packaged material shall not exceed 35%. Submit sample.

2.08 STAKING MATERIALS

A. Stakes for supporting trees shall be of sound wood, uniform in size, free of knots and holes. They shall be nominal 2" x 4" and 10' long for support staking, 3' long for guy wire anchor stakes. Stakes shall be stained dark brown.

B. Wire for tree bracing and guying shall be pliable No. 12 gauge galvanized steel.

C. Hose for covering wire shall be new or used 2 ply reinforced rubber garden hose not less than 1/2" inside diameter.

D. Wrapping material shall be first quality, heavy waterproof crepe paper manufactured for this purpose, or first quality burlap not less than 4" nor more than 6" wide of suitable strength and manufactured for this purpose.

2.09 SEED

A. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 0.25% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturer's Certificates of Compliance. Seed that has become wet, moldy or otherwise damaged shall not be acceptable. Chewings fescue, hard fescue, tall fescue and Ryegrass shall contain Acromonium endophytes. Seed containing endophyte must be kept cool and dry at all times; do not stockpile in the sun.

1. Seed Mixture Composition (not to be used on terraces)

	Common Name	Proportion Minimum	Germination	Purity By Weight Minimum
a.	Creeping Red Fescue	50%		85% 95%

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b. Kentucky Bluegrass 40% 85%
90%
c. Perennial Rye 10% 90%
90%
d. Bluegrass and ryegrass varieties shall be within the top 50 percent and 25 percent respectively, of varieties tested in National Turfgrass Evaluation Program, or currently recommended as low maintenance varieties by University of Massachusetts or the University of Rhode Island.
e. Seeding rate for the General Lawn Seed Mix shall be 6 pounds per 1,000 square feet.

PART 3 - EXECUTION

3.01 METHODS

A. Personnel: The planting and lawn construction shall be performed by personnel familiar with the accepted procedure of planting and under the constant supervision of a qualified planting foreman.

B. Planting Seasons:

1. Deciduous plants shall be planted only when dormant, that is, before leaves appear in the spring and subsequent to their loss in the fall, unless otherwise directed by the Architect.
2. Evergreen plants may be planted in the spring until new growth appears and any time between September 15 and November 30.
3. If the building completion date prohibits in-season planting, the Contractor shall complete his work within the project date and prepare himself for out-of-season planting, including wiltproofing and extra watering.
   a. Plant guarantee periods remain as stated below. No frozen ground planting.

C. Lawn Replacement

1. Remove all areas of dead lawn including root system. The Architect shall be the sole authority as to the extent of lawn replacement areas.
2. Contractor to provide a minimum of 6" of new loam in all areas of lawn replacement. Peat moss shall be mixed into existing hard and/or clay type soil. Architect shall determine the need for and amounts of peat moss required.
3. New grass shall be sod of rye grass, blue grass or a combination of both.
4. Apply starter fertilizer to all areas of newly planted grass.
5. Maintain constant moist soil conditions, a minimum of thirty days.

D. Planting of Trees, Shrubs, and Vines:

1. Unless otherwise directed by the Architect, the indication of a plant to be replaced is to be interpreted as including the digging of a hole, furnishing a plant of the specified size, the work of planting and mulching, and guying, staking and wrapping where called for.
2. One or more stockpiles of approved backfill mixture shall be maintained at all times during the planting operations. The backfill mixture shall consist of 50% topsoil and

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50% specified composted cow manure by volume, thoroughly mixed together. The following shall be added to each area of tree replacement:

a. 5 lbs. of sludge fertilizer
b. 5 lbs. of bone meal
c. 5 lbs. of cottonseed meal
    1) The following shall be added to each area of lawn replacement:
    (a) 1 lb. sludge fertilizer
    (b) 1 lb. bone meal
    (c) 1 lb. cottonseed meal

3. Locations for all plants shall be staked on the ground and must be approved by the Architect before any excavation is made. Adjustments in locations and outlines shall be made as directed. In the event that areas for planting are prepared and backfilled with Backfill Mixture to grade prior to commencement of lawn operations, they shall be so marked that when the work of planting proceeds, they can be readily located.
    a. In case underground obstructions such as ledge or utilities are encountered, locations shall be changed under the direction of the Architect without extra charge.
4. Holes for trees shall be at least 2' greater in diameter than the spread of the root systems and at least 6" deeper than root ball. Holes for shrubs and vines shall be at least 12" greater in diameter than the spread of the root system and at least 18" deep.
5. Specified backfill mixture shall be spread and incorporated with loam in all areas of tree or lawn replacement and as directed by the Architect.
6. Planting: All plant roots and earthballs must be kept damp and thoroughly protected from sun and/or drying winds at all times from the beginning until the final operation, during transportation, and on the ground until the final operation of planting. The plants shall be planted in the center of the holes and at the same depth as they previously grew. They shall be plumbed and turned as directed. Specified Mixture shall be backfilled in layers of not more than 9" and each layer watered sufficiently to settle before the next layer is put in place. Backfill Mixture shall be tamped under edges of balled plants. Enough Backfill Material shall be used to bring the surfaces to finish grade when settled.
    a. A saucer shall be provided around each plant.
    b. Plants must be flooded with water twice within the first 24 hours of time of planting.
    c. Wrapping: The trunks of all shade trees shall be wrapped spirally from the ground to the height of the second branches or as directed. Wrap brown cord 3" on center spirally to hold paper neatly in place.
    d. Provide a 3" layer (after settlement) of bark mulch over the surface of each saucer and over the entire area of shrub beds.
    e. Stake all trees.

E. PLANTING COORDINATION:

1. Replacement plantings must match existing for type and caliber of trees and size of shrubs.
2. The Contractor shall be responsible for selection and tagging at nurseries stocking the specified materials.

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3. Contractor shall inform Architect when planting will commence, anticipated delivery date of material and have made and provided for the staking of all plants and plant bed.
4. Failure to notify the Architect in advance, in order to arrange proper scheduling may result in loss of time or removal of any plant or plants not installed as specified or directed.

3.02 PRUNING

A. Each tree and shrub shall be pruned in accordance with American Nurserymen Association Standards to preserve the natural character of the plant.

B. All dead wood or suckers and all broken or badly bruised branches shall be removed. In addition, 1/3 of the wood may be removed by thinning out to balance root loss due to transplanting providing the natural character and form of the tree is preserved. Never cut a leader.

C. Pruning shall be done with clean, sharp tools.

D. Cuts over 1" in diameter shall be painted with an approved asphaltic tree paint. Paint shall cover all exposed living tissue.

3.03 MAINTENANCE

A. Maintenance shall begin immediately after each plant is planted. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated and otherwise maintained and protected for a minimum of 30 days until provisional acceptance. Settled plants shall be reset to proper grade and position, planting saucer restored and dead material removed. Stakes and wire shall be tightened and repaired.

1. Defective work shall be corrected as soon as possible after it becomes apparent and weather and season permit.

B. Upon completion of planting and prior to provisional acceptance, remove from the site excess soil and debris, and repair all damage resulting from planting operations.

C. Protection: Planting areas and plants shall be protected against trespassing and damage of any kind. This shall include the provision and installation of approved temporary fencing if necessary. If any plants become damaged or injured by vandalism or neglect of others prior to provisional acceptance, the Contractor shall treat or replace them at his own expense.

3.04 ACCEPTANCE AND GUARANTEE

A. After the 30-day maintenance period, the Contractor shall request from the Architect an inspection to determine whether the plant material is acceptable. If the plant materials and workmanship are acceptable, written notice shall be given by the Architect to the Contractor stating that the guarantee period begins from the date of inspection.

B. If a substantial number of plants are sickly or dead at the time of inspection, acceptance will not be granted, and the Contractor's responsibility for maintenance of all plants shall be extended until replacements are made. Replacements shall conform in all respects to specifications for new plants and shall be planted in the same manner.

C. Materials and Operations: All replacements shall be plants of the same kind and size specified on the plant list. They shall be furnished and planted as specified above. The

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cost shall be borne by the Contractor. Replacements resulting from the removal, loss or damage, due to occupancy of the project in any part, vandalism, or acts of neglect on the part of others, physical damage by animals, vehicles, etc., and losses due to curtailment of water by local authorities, will be approved and paid for by the Owner.

D. Plants shall be guaranteed for a period of one year after inspection and shall be alive and in satisfactory growth at the end of the guarantee period.

E. At the end of the guarantee period, inspection will be made again. Any plant required under this Contract that is dead or unsatisfactory shall be removed from the site. These shall be replaced during the normal planting season, until the plants live through one year.

END OF SECTION