Project Manual for

The Havre de Grace Colored School Museum and Cultural Center

Roof Replacement

555 Alliance Street
Havre de Grace, Maryland 21078

ARCHITECTURAL SPECIFICATIONS

BID SET

RRMM, ARCHITECTS
3700 KOPPERS STREET, SUITE 300
BALTIMORE, MARYLAND 21227
PHONE 410-234-8444

DATE: April 24, 2024

Havre de Grace Colored School Museum
And
Cultural Center

Re-Roofing Project

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Summary by References:
Work of Contract can be summarized by reference to the Contract, General Conditions, Supplementary Conditions, specifications sections as listed in the "Table of Contents" bound herewith, addenda and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed matter referenced by any of these. It is recognized that work of Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions, and other forces outside the contract documents.

B. Generally, without force or effect on the work of the contract, the work of the contract can be described to include, but is not limited to, the following:

1. Re-roofing at the Havre de Grace Colored School Museum building located at 555 Alliance Street, Havre de Grace, Maryland. Removal of existing single ply membrane roofing, asphalt built-up roofing, and slate roof systems. Install new roofing membrane system over existing low slope roof areas, and new slate shingle roofing system over existing sloped slate roof areas.
2. The project is being funded by several grants that impact the materials utilized in the work, and the payment schedule.
3. Hazardous material abatement is an integral component of the re-roofing work.
4. Masonry restoration of a chimney.
5. Acquisition of all required permits.
6. Provide all required pedestrian and vehicular traffic mediation to sufficiently divert traffic as needed.
7. Provide temporary, secured staging area for Contractor's storage.
8. Construct temporary exterior access provisions for personnel to access the area of the work.
9. Arrange and pay for all cranes, hoists, and lift equipment necessary to safely transport materials and supplies to and from the area of the work.
10. Miscellaneous mechanical, electrical, and plumbing work.

C. Related Work:
Contract Documents indicate the work of the Contract, and related provisions of the project which may include but are not necessarily limited to the following:
1. Existing site conditions and restrictions.
2. Alternate bid items that may be included in the scope of work at the discretion of the Owner.
3. Other work to be performed concurrently by separate contractors.
4. Requirements for Owner partial occupancy of the site and the building during the execution of the work of Contract.

1.2 REFERENCED STANDARDS
Where reference is made to publications, tests, standard specifications, manufacturer's directions, data sheets, or other literature, latest edition published before date of specifications applies.

1.3 ABBREVIATED SPECIFICATIONS

Portions of specifications may be abbreviated or streamlined and include incomplete sentences. Omission of words or phrases such as "Contractor shall," "In conformity therewith," "shall be," "as noted on Drawings," "a," "an," "the," and "all" are intentional. Omitted words and phrases will be supplied by inference in the same manner as they are for notes on the Drawings.

PART 2 - PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 INITIAL SUBMISSIONS

A. Plan of Operations: Within 10 days following award of Contract, prepare rough draft of "Plan of Operations" and review with Owner and Architect for acceptance. After discussing rough draft with Owner and Architect, make any necessary changes, prepare final draft, and resubmit. Any later deviations from approved plan shall be discussed with and receive acceptance from Owner and Architect well in advance of proposed date for placing new plan in affect. Include following items in Plan of Operations:

1. Sequence of Operations;
2. Graphic schedule showing anticipated completion dates for various phases of work;
3. General information to assist Owner in planning arrangements for services and work not included in this Contract and in preparing for occupancy;
4. Other pertinent details that occur to Contractor, Owner, or Architect.

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

1.2 DEFINITIONS

A. A unit price is an amount proposed by the Contractor as part of the bid process to establish a price per unit of measurement for materials or services added to or deducted from the Contract Sum by incorporating the unit price stipulated in the Contractor's bid form, and multiplying the unit price by the amount of work completed (work that is subject to unit pricing) to arrive at the amount of compensation to be paid the Contractor for the unit price work.

1.3 PROCEDURES

A. Unit prices include all necessary material, including the cost for delivery, labor, equipment, installation, insurance, applicable taxes, overhead, and profit.

B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor.

C. A list of unit prices is included in Part 3 of this specification section. Specification sections referenced in the schedule contain requirements for materials described under each unit price.

D. The Owner reserves the right to withdraw the work described in the unit prices from the Work of the Contract and reduce the Contract stipulated fee by the dollar values assigned to the respective unit prices.

E. The Owner reserves the right to increase the Contract lump sum amount using the respective unit prices, if the measurement of the volume of unit price work exceeds the amount included in the Contract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 LIST OF UNIT PRICES

A. General: Provide a cost for each unit price item on the Bid Form:

Unit Price # 1- Replacement of Damaged Wood Roof Deck:
Provide all labor, material, equipment, and services necessary and incidental to replace severely damaged solid wood roof decking with new, Fire Retardant 2 x 6 solid wood decking attached to existing wood roof joists or rafters with stainless steel anchors. Payment will be made for the actual quantity of material installed measured by the linear foot of 2 x 6 framing lumber. The estimated quantity for bidding is 200 linear feet.

Unit Price #2- Brick Masonry Restoration of Mortar Joints:
Provide all labor, material, equipment, and services necessary and incidental to rake out existing mortar joints and re-point the joints with new mortar in accordance with the Masonry Restoration specifications. Payment will be made for the actual masonry restoration work performed measured by the linear feet of mortar joint restored. The estimated quantity for bidding is 200 linear feet.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes alternate items of work quoted on Bid Form which will be accepted or rejected at the Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work as required.

1.2 ALTERNATES, GENERAL

A. Definitions: Alternates are defined as alternate products, materials, equipment, installations or systems for the work, which may at the Owner's option and under terms established by the Instructions to the Bidders, be selected and recorded in the Contract to either supplement or displace corresponding basic requirements of the Contract Documents.

B. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "allowances", "unit prices", "change orders", "substitutions", and other similar provisions.

C. General Provisions: A "Schedule of Alternates" is included at the end of this section. Each alternate is defined by abbreviated language, recognizing that drawings and specification sections document the requirements. Coordination of related work is required to ensure that work affected by each selected alternate is complete and properly interfaced with work of alternates.

D. Notification: Immediately following award of Contract prepare and distribute to each entity to be involved in performance of the work, a notification of status of each alternate. Indicate which alternates have been: 1) Accepted, 2) Rejected, and 3) Deferred for consideration at a later date as indicated. Include full description of negotiated modifications to alternates, if any.

E. Alternate prices submitted with the contractor's bid shall be valid for the full term of the contract and shall become part of the contract scope of work at any time, at the sole discretion of the Owner.

F. Alternate Prices shall be inclusive of all costs including, but not limited to, the cost of the work, overhead, profit, insurance, bonds, taxes, and related general conditions expenses.

1.3 ALTERNATE SCHEDULE

A. **Alternate No. 1** – The Contractor shall provide all labor, material, equipment, and services necessary and incidental to the removal of the existing slate shingles and underlayment, and replacement with new underlayment and new slate shingles, new copper flashings and trim, new copper ridge roll, and snow guards.

The r**oofing transition detail along the North side of the slate shingle roof where the single ply TPO membrane is extended under three courses of slate shingles is excluded from this alternate bid item. This slate to shingle transition detail shall remain as part of the base contract scope of work.**

This Alternate No. 1 shall be compensated on a lump sum basis.

B. **Alternate No. 2:**
Prior to the demolition of the slate shingle roofing, the Contractor shall engage the Aerosol Monitoring and Analysis company to sample and test the underlayment of the slate shingle

roof area to determine if there are any existing hazardous materials beneath the slate shingles.

This Alternate No. 2 shall be compensated on a lump sum basis.

C. **Alternate No. 3:**
If the underlayment beneath the slate shingle roofing tests positive for hazardous material content, the Contractor shall provide all labor, material, equipment, and services necessary and incidental to remove the hazardous material in strict compliance with the regulations and procedures included in the Contract Documents.

This Alternate No. 3 shall be compensated on a lump sum basis for the additional costs associated with the removal of hazardous material.

D. **Alternate No. 4:**
The Contractor shall provide all labor, material, equipment, and services necessary and incidental to carefully remove existing slate shingles to be salvaged, palletized, and delivered to Owner. Salvaged slate shingles shall be neatly and carefully stacked in standard slate shingle pallets and delivered down to the asphalt parking lot onsite for Owner to store. Contractor shall palletize (3) full pallets of the existing slate shingles; approximately 500 slates. Once the minimum requirement of salvaged shingles has been stored, remainder of existing slate shingles can be disposed of as Contractor deems fit.

This Alternate No. 4 shall be compensated on a lump sum basis.

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SECTION INCLUDES
- A. Construction Photography.
- B. Submittals.

1.2 PHOTOGRAPHY SERVICES
- A. Provide to the Owner two (2) USB thumb drives with copies of all digital photographs, taken during the course of the work of the contract.

1.3 PHOTOGRAPH FORMAT
- A. Full color; minimum 16.0 mega pixel digital resolution photograph file; converted to JPG format for viewing.
- B. Identification: Provide an individual file number for each digital photograph. Provide a separate Microsoft Word file that lists the name of Project, name and address of photographer, phase of work, description of view, photograph date, and photograph file name.

PART 2 - PRODUCTS

2.1 PHOTOGRAPH FILES
- A. Deliver digital file copies of photographs to Owner, at each Application for Payment submission along with one hard copy 4x6 glossy print of each photograph. Catalog and index photograph files in chronological sequence; provide typed table of contents.
- B. Provide photographer's release of copyrights at job completion.

PART 3 - EXECUTION

3.1 TECHNIQUE
- A. Provide factual presentation of construction progress.
- B. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

3.2 VIEWS
- A. Provide a complete set of not less than (24) different views of the project, at the start of construction, one day each week during construction, and at Substantial Completion.
- B. Consult with Owner Representative or Architect as required for instructions on views required.

END OF SECTION

SECTION 01 33 00

SUBMITTALS PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Submittal procedures
   2. Proposed products list
   3. Shop drawings
   4. Product data
   5. Samples
   6. Manufacturers' instructions
   7. Manufacturers' certificates

1.2 SUBMITTAL PROCEDURES

A. Consecutively number all submittals.
   1. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
   2. On re-submittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. Identify Project, Contractor, subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.

D. The Contractor shall stamp all submittals with a statement "(Name of Contractor) has reviewed this submittal and coordinated this product with the work of the contract, and further certifies that this product complies in every aspect with the requirements of the Contract Documents". Any deviations from the requirements of the Contract Documents or variation from the specified product shall be described in detail in writing in a cover letter to the submittal.

E. On at least the first page of each component of the submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

F. Identify variations from Contract Documents and product of system limitations which may be detrimental to successful performance of the completed Work.

G. Provide space for Architect review stamps.

H. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

I. In scheduling, allow at least ten (10) working days for review following receipt of this submittal.

J. Architect's review does not relieve the Contractor and subcontractor from responsibility for errors which may exist in the submitted data.

K. Revisions:
   1. Make revisions required.
   2. If the Contractor considers any required revision to be a change, he shall make notification as provided for in the General Conditions.

3. Make only those revisions directed or approved.

L. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
   1. Partial submittals may be rejected as not complying with the provisions of the Contract.
   2. The Contractor may be held liable for delays so occasioned.

M. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Architect for review upon request.

1.3 PROPOSED PRODUCTS LIST

A. Submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.4 SHOP DRAWINGS

A. Shop drawings shall not be reprints of the Contract Drawings.

B. All deviations from the contract documents shall be highlighted on the shop drawings and further enumerated in detail in writing on a separate cover letter to the submittal.

C. Scale and measurements: Make shop drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

D. Types of prints required: Submit Shop Drawings in the form digital, electronically transmitted Adobe Acrobat PDF files.

E. The Architects review comments will be returned as an electronic transmission.

1.5 PRODUCT DATA

A. Submit digital, electronically transmitted, Adobe Acrobat PDF files

B. Mark each submittal to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this project.

C. After review, distribute as required.

1.6 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinated sample submittals for interfacing work.

B. Submit samples of finishes in color ranges specified, textures, and patterns for Architect selection.

C. Include identification on each sample, with full Project information. This identification shall be securely affixed to the sample.

D. One of each of the samples submitted as specified in individual specification Sections will be retained by Architect.

E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.7 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for Product Data.

B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.8 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification Sections, submit manufacturers' certificate to Architect for review, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

PART 2 - PRODUCTS

2.1 DEFINITIONS

A. Approved Equal

The term “Approved Equal” , as it is used in the Contract Documents, shall be interpreted as an opportunity for the Contractor to substitute a product that is equal to the specified product in all regards, subject to approval by the Architect of the substitution. The burden for researching the market place and finding an “Approved Equal” product shall be the sole responsibility of the Contractor. The use of the term “Approved Equal” shall in no way be interpreted to mean that an equal product is currently manufactured or available. The use of the term “Approved Equal” is intended to communicate to the contractor that the Architect has not conducted an exhaustive search to find equal products, but the Contractor has the opportunity to do so.

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 35 00

SPECIAL PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The types of minimum requirements for procedures and performance or control work of a general nature include, but are not necessarily limited to the following categories:

1. General installation provisions
2. Coordination and meetings
3. Surveys and records
4. Limitations for use of site
5. Workmanship
6. Cleaning and protection
7. Conservation and salvage

1.2 OWNER'S OCCUPANCY OF THE SITE

The Owner will occupy the site during the work of the Contract. The Contractor shall allocate use of the site to allow the Owner's free use of the areas of the Owner's property outside the immediate Construction site. The Contractor shall at all times, without exception, maintain clear and unobstructed exits and entrances from the building and the site for emergency vehicles.

1.3 EXISTING SITE CONDITIONS

The Owner makes no guarantee as to the accuracy of the data shown on the drawings as existing conditions. The Contractor shall verify all pre-existing conditions on the site prior to the start of work.

1.4 SMOKING

Smoking is strictly prohibited at the job site throughout the building and site at all times.

PART 2 – PRODUCTS

NOT APPLICABLE

PART 3 – EXECUTION

3.1 LAYING OUT WORK

A. The Contractor shall lay out their own work and be responsible for all lines, elevations, and measurements of work they execute under the Contract. They must exercise proper precaution to verify figures shown on Drawings before laying out work.

B. The Contractor shall take field measurements prior to preparation of shop drawings and fabrication, to ensure proper fitting of work.

3.2 MANUFACTURER'S DIRECTIONS

All manufactured articles, materials, equipment, fixtures, and accessories shall be handled, stored, applied, installed, connected, erected, used, cleaned, and conditioned as manufacturers direct, unless Architect otherwise indicates, specifies, or directs, in writing.

3.3 GENERAL INSTALLATION PROVISIONS

A. Manufacturer's Instructions:

1. Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to the extent these are more explicit or more stringent than requirements indicated in the contract documents.
2. All manufactured articles, materials, equipment, fixtures, and accessories shall be handled, stored, applied, installed, connected, erected, used, cleaned, and

conditioned as manufacturers direct, unless Architect otherwise indicates, specifies, or directs, in writing.

3. Inspect each item of materials or equipment immediately prior to installation and reject damaged and defective items.
4. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerances if not otherwise indicated. Allow for expansions and building movements. Provide uniform joint widths in exposed work, organized for the best possible visual effect. Refer questionable visual effect choices to the Architect for final decision.
5. Recheck measurements and dimensions of the work, as an integral step of starting each installation.
6. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
7. Coordinate enclosure of work with required inspections and tests, so as to minimize necessity of uncovering work for that purpose.

B. Mounting Heights: Where mounting heights are not indicated, mount individual units of work at industry recognized standard mounting heights or ADA standards as applicable. Refer questionable mounting height choices to the Architect for final decision.

3.4 COORDINATION OF ALL WORK OF THE CONTRACT

A. General: Prepare, communicate, and distribute to each entity performing work at the project instructions on required coordination activities, including required notices, reports and attendance at meetings. Take all necessary action to coordinate separate contractors where interfacing of work is required. The Contractor is responsible for reviewing all of the separate systems, equipment, finishes and appurtenances of the project in advance of their fabrication, delivery, and construction. The Contractor shall layout all work of the contract in advance of fabrication, delivery, and construction, and shall resolve all interference between the separate systems, equipment, finishes and appurtenance components.

B. Coordination Drawings: Where work by separate entities requires off-site fabrication of products and materials which must be accurately interfaced and closely intermeshed to produce required results, prepare coordination drawings to indicate how work shown by separate shop drawings will be interfaced, intermeshed, and sequenced for installation. Comply with submittal requirements of “Submittals” section.

C. Responsibility for Quality Assurance: The Contractor is responsible for the timing and/or scheduling of the ordering, shipping, fabrication, delivery, and installation of all materials at all times throughout the contract. Payment by the Owner for stored materials shall not be an indication of acceptance of those materials with regards to the quality, size, fit or dimensional accuracy. The Owner does not waive the Owner’s right to reject unsatisfactory, unacceptable materials, by way of payment for stored materials.

3.5 LIMITATIONS FOR USE OF SITE

A. General: In addition to site utilization limitations and requirements shown on the drawings, and indicated by other contract documents, administer allocation of available space equitably among entities needing access and space, so as to produce best overall efficiency in performance of total work of project. Schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

B. Contractor may stage materials on-site following coordination with Owner regarding the specifics of what materials will be brought on-site to determine appropriate location – Contractor may not stage materials on-site without consulting the Owner for guidance. Contractor shall repair any landscaping or pavement that is damaged by the materials or storage equipment following project completion.

3.6 TRADESPERSONS AND WORKMANSHIP STANDARDS

A. General: Investigate and maintain procedures to ensure that persons performing work at site are skilled and knowledgeable in methods and craftsmanship needed to produce required quality levels for workmanship in completed work. Remove and replace work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated. Remove and replace other work damaged or deteriorated by faulty workmanship or its replacement.

3.7 CLEANING AND PROTECTION

A. General: During handling and installation of work at the project site, clean and protect work in progress and adjoining work on a basis of perpetual maintenance. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

The Contractor shall protect all existing to remain structures, finishes, and surfaces from damage or soiling. This shall include, but not limited to, protective floor mats along paths of travel and interior work areas, as well as plastic sheeting at interior work areas to prevent dust accumulation.

B. Limiting Exposures of Work: To the extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work is subject to dangerous, damaging, or otherwise deleterious exposures during construction period. Such exposures include (where applicable, but not by way of limitation) static loading, dynamic loading, internal pressures, external pressures, high or low temperatures, thermal shock, high or low humidity, air contamination or pollution, water, ice, solvents, chemical, light, radiation, puncture, abrasion, heavy traffic, soiling, bacteria, insect infestation, combustion, electrical current, high speed operation, improper lubrication, unusual wear, misuse, incompatible interface, destructive testing, misalignment, excessive weathering, unprotected storage, improper shipping/handling, theft and vandalism.

C. **Contractor shall notify the Owner before initiating construction activities that generate dust, heat, or smoke. Contractor shall establish protection of existing systems that may be activated, de-activated, or damaged by dust, heat, or smoke such as smoke detectors, heat detectors, fire alarm devices, and fire suppression sprinkler systems prior to commencement of the construction activity.**

3.8 CONSERVATION AND SALVAGE

It is a general procedural requirement for supervision and administration of the work that construction operations be carried out with maximum practical consideration for conservation of energy, water, and materials; and with maximum practical consideration for salvaging materials and equipment involved in performance of the work but not incorporated therein. Refer to other sections for required disposition of salvage materials and equipment which are Owner's property.

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References.

C. Mock-up.

D. Inspection and testing laboratory services specified in Sections of Divisions 2 through 48 of these Specifications.

E. Manufacturers' field services and reports specified in Sections of Divisions 2 through 48 of these Specifications.

1.2 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

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

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

C. All manufactured articles, materials, equipment, fixtures, and accessories shall be handled, stored, applied, installed, connected, erected, used, cleaned and conditioned, as directed by the manufacturers, unless otherwise indicated, specified, or directed by the Architect in writing. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect **before** proceeding.

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

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure products in place with positive anchorage devices designed and sized to withstand stress, vibration, physical distortion, or disfigurement.

1.3 GENERAL WORKMANSHIP

A. Workmanship shall be neat, thorough, substantial and conform to the following, unless otherwise indicated or specified.

B. Units: Set level, plumb, or true to other lines indicated. Fit neatly and closely together and anchor firmly in place.

C. Surfaces:
1. Level, plumb, true to indicated plane;
2. Smooth, flat;
3. Uniform in color and texture;
4. Clean and neat in appearance.

D. Joints and seams: Conceal where possible, except where otherwise indicated or specified.

E. Joints and seams exposed to view:
1. Neat, straight, tight, flush, smooth, uniform, strong;
2. Plumb, level or otherwise true to line indicated;

3. Located where least conspicuous;
4. Construct to prevent opening;
5. Equally spaced;
6. Obtain Architect's written acceptance of joints and seams exposed to view, except where such exposure is shown or specified.

F. Coursing: Uniform, accurately spaced, modular unless otherwise noted.

G. Corners, straight square, sharp, neat, plumb, level, or true to other lines indicated.

H. Anchors, fastenings, connections, accessories:
1. Provide anchors, fastenings, framing, supports, hangers, bracing, brackets, straps, angles, bolts, etc., adequate in size, design and quantity to set and connect work rigidly in place and to safely sustain stresses to which they will normally be subjected.
2. Conceal such work where possible, except where otherwise indicated or specified.
3. Such items exposed to view shall be equally spaced, located where least conspicuous and neat in appearance. Obtain Architect's written acceptance of exposed items except where such exposure is shown or specified.

1.4 REFERENCES

A. Where reference is made to publications, tests, standard specifications, manufacturer's directions, data sheets or other literature unless the date is stated, the latest edition published before date of specifications shall apply.

B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Architect.

1.6 MOCK-UP

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

B. If mock-up is permitted by the Contract Documents to be part of the Work, it may be incorporated into the finished Work when approved in advance by the Architect. If mock-up is not permitted to be incorporated in the work, remove mock-up from the site.

1.7 INSPECTION AND TESTING LABORATORY SERVICES

A. Submit name and qualifications of independent testing agencies for approval by the Owner and Architect prior to commencement of the work.

B. The independent firm will perform inspections, test, and other services specified in individual specification Sections and as required by the Architect.

C. Reports will be submitted by the independent firm to the Architect, in triplicate, indicating observations and results of test and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, and assistance as requested.

1. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.
2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions from the Architect. The cost of re-testing shall be borne by the Contractor.

1.8 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect 30 days in advance of required observations. Observer subject to approval of Architect and Owner.

B. 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, test, adjust, and balance of equipment as applicable.

C. Contractor shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

D. Submit report in duplicate to Architect for review, within 15 days of observation.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 45 29

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Selection and payment.

B. Laboratory responsibilities.

C. Laboratory reports.

D. Limits on testing laboratory authority.

E. Contractor responsibilities.

F. Schedule of inspections and tests.

1.2 SELECTION AND PAYMENT

A. Contractor shall employ and pay for services of an independent testing laboratory to perform Certified Inspection and Testing Firm (CITF) when testing is indicated in the separate specification sections of these Contract Documents.

B. Employment of testing laboratory (CITF) shall in no way relieve Contractor of obligation to perform work in compliance with requirements of Contract Documents.

1.3 CERTIFIED INSPECTION AND TESTING FIRM (CITF) RESPONSIBILITIES

A. Perform testing on samples submitted by Contractor to testing laboratory.

B. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.

C. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Contractor and Owner of observed irregularities or non-conformance of Work or products.

F. Perform additional inspections and tests required by Architect/Engineer.

G. Attend preconstruction conferences and progress meetings.

1.4 LABORATORY REPORTS

A. After each inspection and test, promptly submit 4 copies of laboratory report to Contractor, with 2 copies each to Architect and Owner.

B. Include:
   1. Data issued.
   2. Project title and number.
   3. Name of inspector.
   4. Date and time of sampling or inspection.

5. Identification of product and Specification Section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Compliance with Contract Documents.

C. When requested by Architect/Engineer, provide interpretation of test results.

1.6 LIMITS ON CITF AUTHORITY

A. CITF may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. CITF may not approve or accept any portion of the Work.

C. CITF may not assume any duties of Contractor.

D. CITF has no authority to stop the Work unless life-threatening health or safety conditions exist.

1.7 CONTRACTOR RESPONSIBILITIES

A. Deliver to laboratory, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.

B. Cooperate with CITF personnel and provide access to the Project.

C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, and to facilitate tests and inspections, storage and curing of test samples.

D. Notify CITF and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes temporary facilities and controls needed for Work including, but not necessarily limited to:
   1. Sanitary facilities;
   2. Enclosures such as tarpaulins, barricades, and canopies.
   3. Temporary access provisions

B. Exclusions from this Section:
   1. Equipment individual trades normally furnish to execute their own portions of Work are not part of this Section.

1.2 REQUIREMENTS

A. Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in the General Conditions and other contract documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication by the Architect that such temporary activity is not required for successful completion of the work and compliance with requirements of contract documents. The Contractor shall be responsible for all temporary facilities, equipment, materials, and services necessary and incidental to the completion of the work of the Contract.

B. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, security/protection provisions, and support facilities.

1.3 QUALITY ASSURANCE

A. General: In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, comply with specific requirements indicated and with applicable local industry standards for construction work.

B. NFPA Code: Comply with NFPA Code 241 "Building Construction and Demolition Operations".

1.4 JOB CONDITIONS

A. General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.

B. Conditions of Use: Install, operate, maintain, and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property, and free of deleterious effects.

PART 2 - PRODUCTS

2.1 TEMPORARY UTILITY SERVICE

A. General: Where possible and reasonable, connect to existing franchised utilities for required services and comply with service companies' recommendations on materials and methods, or engage service companies to install services. Locate and relocate services to minimize interference with construction operations.

B. Potable Water: Water connection (without charge) to Owner's existing potable water system is limited to one, ¾" pipe size connection, and a maximum flow of 10 GPM. Water usage shall be strictly limited to water required for on-site construction activities. Water required for the execution of the contract work, in volumes and pressure beyond that available at the site through the prescribed ¾" pipe at 10 GPM, shall be provided by the Contractor at no additional cost to the Owner.

C. Temporary Power: Electrical power may be obtained by the Contractor from Owner's existing service in the building; but is limited to local 20-ampere rated circuits that are suited for small power tools. Any electrical power necessary to execute the work of the contract that is above and beyond the limits stated above shall be provided by the Contractor at no additional expense to the Owner.

2.2 TEMPORARY CONSTRUCTION FACILITIES

A. General: The types of temporary construction facilities required include, but not by way of limitation, the items listed below. Provide facilities reasonably required to perform construction operations properly and adequately.

B. Enclosure: Provide temporary enclosure where reasonably required to ensure adequate workmanship and protection from weather and unsatisfactory ambient conditions for the work, including enclosure where temporary heat is used. Provide fire retardant treated lumber and plywood. Provide tarpaulins with UL label and flame spread of 15 or less.

C. Heating: Provide temporary heat to maintain temperatures required in each section of the Contract Documents. Heaters shall bear UL, FM approval labels appropriate for application.

D. Electrical Power: Provide weatherproof, grounded, power distribution system sufficient to accommodate construction operations requiring power, use of power tools, and lighting. Provide overload protection.

E. Lighting:
1. Provide sufficient temporary lighting to ensure proper workmanship everywhere, by combined use of daylight, general lighting, and portable plug-in task lighting. Provide general lighting with local switching which will enable energy conservation during periods of varying activity.

F. Access Provisions:
1. Provide all necessary temporary access equipment including, but not limited to, stairs, ladders, scaffolding, cranes, platforms, and man-lifts. Provide access at all times for inspections of the Work by the Owner, Architect and agencies having jurisdiction.
2. Comply with reasonable requests of governing authorities performing inspections. When permanent stairs are available for access during construction, cover finished surfaces with sufficient protection to ensure freedom from damage and deterioration at time of substantial completion.

2.3 SECURITY AND PROTECTION PROVISIONS

A. General:

1. The types of temporary security and protection provisions required include, but not by way of limitation, the items listed in this section. These provisions are intended to minimize property loss, personal injuries, and claims for damages at the project site.
2. Provide the services and systems described in this specification section 01 50 00 in coordination with the Contractor's activities on the site, and in a manner to achieve 24-hour, 7-day per week effectiveness.

B. Fire Extinguishers: Provide types, sizes, numbers, and locations as would be reasonably effective in extinguishing fires during early stages, by personnel at the project site. Provide type ABC dry chemical extinguishers at all locations; comply with recommendations of NFPA No. 10. Post warning and quick instructions at each extinguisher location, and instruct personnel at project site, at time of their first arrival, on proper use of extinguishers and other available facilities at project site. Post local fire department call number on each telephone instrument at project site.

C. Building Enclosure and Lockup: Secure building against unauthorized entrance at times when personnel are not working.

D. Environmental Protection Procedures: Provide facilities, establish procedures, and conduct construction activities in a manner which will ensure compliance with environmental regulations controlling construction activities at the project site. Designate one person, the Construction Superintendent, to enforce strict discipline on activities related to generation of wastes, pollution of air/water/soil, generation noise, and similar harmful or deleterious effects which might violate regulations or reasonably irritate persons at or in the vicinity of the project site.

2.4 MAINTENANCE AND PROTECTION OF TRAFFIC

A. Provide temporary traffic control devices, services, equipment, and fixtures necessary to safely maintain and protect existing vehicular and pedestrian traffic adjacent to, and in anyway effected by, the work of the Contract.

B. Contractor shall provide manpower, barricades, flashing warning lights, flags, and traffic control personnel to effectively maintain safe conditions around the work, for occupants, pedestrians, vehicles and the public.

2.5 TEMPORARY SUPPORT FACILITIES

A. General: The types of temporary support facilities required include, but not by way of limitation, the items specified hereinafter, all as may be reasonably required for proficient performance of the work and accommodation of personnel at the site including Owner's and Architect's personnel. Locate temporary support facilities for convenience of users, and for minimum interference with construction activities.

B. Contractor's Storage: The Contractor shall provide any and all means and methods for temporary storage on the site, including, but not limited to, storage trailers for materials required in the construction. The Owner will not provide any space for storage of the Contractor's materials, equipment, or tools.

C. Sanitary Facilities: Provide self-contained toilet units of type acceptable to governing authorities, adequate for use of personnel at the project site. Provide separate facilities for male and female personnel when both sexes are working (in any capacity) at the project site.

D. Drinking Water: Provide drinking water, dispenser, cups and waste receptacles.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of Work.

B. Remove such temporary facilities and controls as rapidly as progress of Work will permit, or as Architect directs.

END OF SECTION

SECTION 01 62 00

PRODUCT OPTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Product Options
   2. Substitutions

1.2 PRODUCT OPTIONS

A. Products specified by reference standards or by description only: Any product meeting those standards or description.

B. Products specified by naming one or more manufacturers:
Products of 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.

1.3 SUBSTITUTIONS

A. Instructions to Bidders state time restrictions for submitting requests for substitutions during the bidding period.

B. Submit requests in accordance with requirements specified in this Section. Substitution acceptance, if any, will be stated by addenda issued prior to Bid Date.

C. Substitutions may be considered after award of Contract only when a product specified becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Documentation shall include point by point comparison of specified product to proposed substitution.

E. A request constitutes a representation that the Bidder or Contractor:
   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 which may be required for the Work to be completed with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.

F. Substitutions shall <u>not</u> be incorporated, indicated, or implied on shop drawing or product data submittals, without prior separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:
   1. Submit 3 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.
   3. The Architect will make notification in writing, of decision to accept or reject request.

I. Determination of Approved Equal:
The term “Approved Equal”, as it is used in the Contract Documents, shall be interpreted as an opportunity for the Contractor to substitute a product that is equal to the specified product in all regards, subject to approval by the Architect of the substitution. The burden for researching the marketplace and finding an “Approved Equal” product shall be the sole responsibility of the Contractor. The use of the term “Approved Equal” shall in no way be interpreted to mean that an equal product is currently manufactured or available. The use of the term “Approved Equal” is intended to communicate to the contractor that the Architect has not conducted an exhaustive search to find equal products, but the Contractor has the opportunity to do so.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SUBSTITUTION REQUEST

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Section	Page	Paragraph	Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

_____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents which the proposed substitution will require for its proper installation.

Attached is a point by point comparison of specified product to proposed substitutions.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. All provisions of Section 01 62 00 apply to this substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

SUBMITTED BY:

Signature _____ For use by the design consultant

Firm _____ [ ] Accepted [ ] Accepted as noted

Address _____ [ ] Not Accepted [ ] Received too late

_____ By _____

Date _____

Telephone _____ Remarks _____

Attachments:

END OF SECTION

SECTION 01 66 00

PRODUCT STORAGE & HANDLING REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Packaging and Transportation.

B. Delivery and Receiving

C. Product Handling

D. Storage, General

E. Enclosed Storage

F. Maintenance of Storage

G. Protection of Finished Work

H. Repair and Replacement

PART 2 – PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 TRANSPORTATION AND HANDLING

A. Packaging and Transportation

1. Require supplier to package finished products in boxes or crates for protection during shipment, handling, and storage. Protect sensitive products against exposure to elements and moisture.
2. Protect sensitive equipment and finishes against impact, abrasion, and other damage.

B. Delivery and Receiving

1. Arrange deliveries of products in accordance with construction progress schedules. Allow time for inspection prior to installation.
2. Coordinate deliveries to avoid conflict with Work and conditions at site; limitations on storage space; availability of personnel and handling equipment; and Owner's use of premises.
3. Deliver products in undamaged, dry condition, in original unopened containers or packaging with identifying labels intact and legible.
4. Clearly mark partial deliveries of component parts of equipment to identify equipment and contents, to permit easy accumulation of parts, and to facilitate assembly.
5. Immediately upon delivery, inspect shipment to assure:
   a. Product complies with requirement of Contract Documents and reviewed submittals.
   b. Quantities are correct.
   c. Accessories and installation hardware are correct.
   d. Containers and packages are intact and labels legible.
   e. Products are protected and undamaged.

C. Product Handling
1. Provide equipment and personnel to handle products, by methods to prevent soiling and damage.
2. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.
3. Handle product by methods to avoid bending or overstressing. Lift large and heavy components only at designated lift points.

3.2 STORAGE AND PROTECTION

A. General
1. Store products immediately upon delivery in accordance with the manufacturer's instructions, with seals and labels intact. Protect until installed.
2. Arrange storage in a manner to provide access for maintenance of stored items and for inspection.
3. Stored materials must not conflict with work conditions. On-site storage methods and locations are subject to Owner's approval.

B. Enclosed Storage
1. Store products subject to damage by the elements in substantial weathertight enclosures.
2. Maintain temperature and humidity within ranges stated in manufacturer's instructions.
3. Provide humidity control and ventilation for sensitive products as required by manufacturer's instructions.
4. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.

C. Maintenance of Storage
1. Periodically inspect stored products on a scheduled basis.
2. Verify that storage facilities comply with manufacturer's product storage requirements.
3. Verify that manufacturer-required environmental conditions are maintained continually.
4. Verify that surfaces of products exposed to the elements are not adversely affected and that any weathering of finishes is acceptable under the requirements of Contract Documents.
5. **Contractor shall remove packing materials and all trash from the job site and dispose off site in a legal manner.**

D. Storage of Salvaged Building Components
Contractor shall provide temporary storage facilities for items to be salvaged and/or re-installed.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: This Section establishes general requirements pertaining to cutting, fitting, and patching of Work required to:
   1. Make the several parts fit properly.
   2. Remove and/or uncover existing finishes or structures to provide for installation or inspection of new work.
   3. Patch existing finishes and structures in connection with new work.
   4. Remove and replace work not conforming to requirements of Contract Documents.
   5. Remove and replace defective work.

B. Related work:
   1. In addition to other requirements specified, upon Architect's request uncover work to provide for Architect's inspection of covered work and remove samples of installed materials for testing.
   2. Do not cut or alter work performed under separate contracts without the Architect's written permission.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Request for Architect's consent:
   1. Prior to cutting that affects structural safety, submit a written request to Architect for permission to proceed with cutting.
   2. Should conditions of Work or schedule indicate required change of materials or methods for cutting and patching, notify Architect and secure the Architect's written permission.

B. Notice to Architect: Submit written notice to Architect designating time Work will be uncovered, to provide for Architect's observation.

1.4 PAYMENT OF COSTS

A. Perform cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications. If not identified in other sections of these specifications, provide material to match adjacent construction.

PART 3 - EXECUTION

3.1 CUTTING AND PATCHING

A. General
   1. Where cutting of any structural member is required and such cutting is not indicated or specified, first obtain Architect's written acceptance for each location. Also obtain written approval from local building officials, if required by local building code.
   2. Do not cut and patch structural work in a manner resulting in reduction of load carrying capacity or load/deflection ratio. Do not cut and patch operational elements and safety related components in a manner resulting in decreased operational life, increased maintenance, or decreased safety. Do not cut and patch work which is exposed on the exterior or exposed in occupied spaces of the building, in a manner resulting in reduction of visual qualities or resulting in substantial evidence of cut and patch work, both as judged solely by the Architect. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory or otherwise objectionable manner.
   3. Where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.
   4. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
   5. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.

B. Materials: Except as otherwise indicated or approved by the Architect, provide materials for cutting and patching which will result in equal or better work than work being cut and patched; in terms of performance characteristics and including visual effect where applicable. Use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.

3.2 TEMPORARY SUPPORT AND PROTECTION

A. Provide adequate temporary support for work to be cut, to prevent failure. Do not endanger other work. Provide adequate protection of other work during cutting and patching, to prevent damage; and provide protection of the work from adverse weather exposure.

3.3 SURFACE CONDITIONS

A. Inspection:
   1. Inspect existing conditions, including elements subject to movement or damage during cutting and patching.
   2. After uncovering work, inspect conditions affecting installation of new work.

B. Discrepancies:
   1. If uncovered conditions are not as anticipated, immediately notify Architect and secure needed directions.
   2. Do not proceed until unsatisfactory conditions are corrected.

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Throughout construction period, maintain buildings and site in standard of cleanliness as described in this Section.

B. Related work: In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to standards described in this Section, comply with pertinent requirements and standards.

1.3 SAFETY REQUIREMENTS

A. Standards: Maintain project in accordance with safety and insurance requirements and standards.

B. Hazard Control: Store volatile wastes in covered metal containers and remove from premises daily. Prevent accumulation of waste that creates hazardous conditions. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws. Do not burn or bury rubbish and waste materials on project site. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Do not dispose of wastes into streams or waterways.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

A. Provide required personnel, equipment, and materials needed to maintain specified standard of cleanliness.

2.2 COMPATIBILITY

A. Use only cleaning materials and equipment compatible with surface being cleaned as manufacturer of material recommends.

B. **Contractor shall dispose of cleaning chemicals, cleaning supplies and hazardous materials in a legal manner that includes proper tracking records.**

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General:

1. Retain stored items in orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.

2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of the Work.
3. At least twice each week, and more often if necessary, completely remove all scrap, debris, and waste material from job site.
4. Provide adequate storage for all items awaiting removal from job site, observing requirements for fire prevention and protection of ecology.

B. Site:
1. Daily, and more often if necessary, inspect site and pick up all scrap, debris, and waste material. Remove such items to place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on site. Restack, tidy, or otherwise arrange to meet requirements of the contract documents.
3. Maintain site in neat and orderly condition at all times.
4. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris and rubbish. Clean mud, dirt, and debris resulting from building operation from drives, roads, and lots as required, and maintain access roads to site in good condition.
5. Provide on-site dumpster containers for collecting waste materials, debris, and rubbish.
6. **Contractor shall inspect the site at the end of each workday and collect all deleterious objects and materials resulting from construction activities including, but not limited to, nails, screws, and other sharp objects.**

C. Dust Prevention:
Contractor shall provide adequate means of dust prevention measures within the interior of the building as well as the exterior.

3.2 FINAL CLEANING
A. "Clean," for purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning level of cleanliness generally provided by skilled cleaners using commercial-quality building maintenance equipment and materials.

B. Prior to completing Work, remove from job site all tools, surplus materials, equipment, scrap, debris, and waste.

C. Site: Broom clean paved areas on site and public paved areas adjacent to site, where debris and dirt are the result of Contractor’s work.

D. Structures - Clean to remove debris and dirt caused by Work of Contract:
1. Exterior:
   a. Visually inspect the exterior of surfaces and remove all traces of soil, waste materials, smudges and other foreign matter created by the Contractor’s work.
   b. Remove all traces of splashed materials created by the Contractor’s work from adjacent surfaces.
   c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
   d. In the event of stubborn stains not removable with water, pressure wash or other cleaning method at no additional cost to Owner.
2. Interior:
   a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter created by the Contractor’s work.

E. Inspection and Schedule:
   1. In preparation for substantial completion or occupancy, conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.
   2. Schedule final cleaning as approved by Owner.

F. If Contractor fails to clean up at completion of work, Owner may do so and charge cost to Contractor.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES
- A. Administrative provisions for Final Acceptance.

1.2 FINAL COMPLETION
- A. When Contractor considers Work is complete, the Contractor shall submit written certification of the following:
  1. Work has been completed in compliance with Contract Documents.
  2. Roof has been inspected by roofing manufacturer representative and approved.
  3. Roof warranty has been issued by roofing manufacturer.
  4. Final Completion Inspection: Work is complete and ready for final inspection by Owner and Architect.

1.3 CLOSEOUT SUBMITTALS
- A. Project Record Documents.
- B. Evidence of Payment and Release of Liens: In accordance with Conditions of the Contract.
- C. Consent of Surety to Final Payment.
- F. Certificates of Warranties for Products and Completed Operations: In accordance with Supplementary Conditions.

1.4 APPLICATION FOR FINAL PAYMENT
- A. Submit application for Final Payment in accordance with provisions of Conditions of the Contract after the Contractor has complied with Article "Closeout Submittals" of this Section.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 02 10 00

REMOVAL OF ASBESTOS CONTAINING ROOFING

PART 1 - GENERAL

1.1 ADMINISTRATIVE

A. Contractor shall be responsible for all labor, materials, expertise, training and licensing required for the proper access, testing, removal, packaging, transportation and disposal of asbestos-containing roofing materials present on the roof areas at the Harve de Grace Colored School, Museum and Cultural Center.

Contractor to provide pricing under Base Bid and Alternate #1.

Work shall include, but is not limited to the removal, packaging and disposal of the following asbestos-containing roofing materials

BASE BID (1936 Brick Structure Roof/Valley Transition)

Asbestos Removal and Disposal of:

- ACM - Built-Up Roofing materials beneath existing TPO membrane (**4,000 SF)**
- ACM - Black Tar on brick parapet, roof, and chimneys **(800 SF)**
- ACM – Built-Up Roofing materials beneath existing TPO membrane at Slate Roof Transition **(400 SF)**
- Full Time Monitoring services during asbestos roof removal

ALTERNATE #1 (1912 Original Wood Structure Slate Roof)

- Testing by Maryland Accredited Asbestos Inspector of Suspect Asbestos Roofing and Tar materials located under slate shingles **(2,400 SF)**
- If ACM is identified in Alternate #1, provide unit rates for removal and disposal of quantity of roofing identified at 1912 Original Wood Structure Slate Roof .
- Full time Monitoring services during asbestos roof removal.

B. The contractor is responsible for the access to roofing materials to be disturbed as part of the roof replacement project, verification of all quantities and conditions referenced within this document, and other associated documents to ensure compliance with all applicable regulatory and specified requirements in order to complete the proper removal and disposal of asbestos containing roofing materials. **If roofing materials do not contain asbestos, asbestos removal will not be required for the 1912 roof. General roof demolition and safety requirements must still be adhered to.**

C. The Contractor shall include in their cost for an independent third-party, Maryland accredited AHERA Asbestos Inspector to conduct testing of roofing materials associated with the 1912 Original Wood Structure (Slate Roof) made accessible as a part of the project. The inspector must collect samples of all suspect asbestos containing materials (ACM) to be

disturbed associated with the Slate Roof replacement (Alternate #1). The Asbestos Inspector must collect a minimum of 3 samples per suspect material encountered on the roof. All samples must be analyzed following the EPA method 600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials, by a NVLAP accredited laboratory. A written report, signed by the Maryland Licensed Inspector, shall be provided within 7 days of sample collection, with a determination of asbestos presence in the roofing materials. **If roofing materials do not contain asbestos, the requirements for asbestos removal will not be required on the slate roof. General roof demolition and safety requirements must still be adhered to.**

D. Contractor shall include in their cost for an independent third-party monitor to conduct asbestos abatement air monitoring services in and around the asbestos abatement areas and to ensure abatement contractor compliance with all regulations and requirements as described herein. The monitor shall have, at a minimum, current certifications as, AHERA Inspector, Supervisor and NIOSH 582 or equivalent. The monitor must be on-site at all times when asbestos abatement activities are occurring to ensure debris clean up, to include inspection of interior areas beneath roof work and exterior public spaces around the building.

1.2 APPLICABLE STANDARDS AND GUIDELINES

A. The contractor shall assume full responsibility and liability for the compliance with all applicable laws, regulations, standards, licensing requirements and patented systems pertaining to asbestos abatement work practices, hauling and disposal, protection of workers, visitors, and persons occupying areas adjacent to the work site.

B. The contractor shall have available copies of all applicable codes, regulations, standards, documents and this specification.

C. Where conflicts among the requirements of the codes, regulations, standards, documents and this specification exist, the most stringent requirement shall be utilized by the contractor.

1. **Code of Federal Regulations (CFR):**
29 CFR 1910.1001, Occupational Safety and Health Act (OSHA) Appendix A - I.

29 CFR 1926.1101, Asbestos in Construction, including Appendices.

29 CFR 1910.20, Subpart C, General Safety and Health Provisions.

40 CFR Part 61, Subpart M: U.S. Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos.

40 CFR Part 763 Asbestos Containing Materials in Schools, Public and Commercial Buildings (ASHARA)

29 CFR 1910.134: OSHA General Industry Respirator Requirements.

2. **State and Local Regulations:**
COMAR 26.11.21: Control of Asbestos

COMAR 26.11.23: School Asbestos Accreditation of Individuals

3. **Guidance Documents**
EPA Document 340.B.94.001-Guidance Manual for Asbestos Roofing Removal.

1.3 NOTIFICATION REQUIREMENTS

A. The contractor shall be responsible for composing and submitting to the proper authorities any required Federal and State of Maryland asbestos abatement notification. The contractor shall also be responsible for submitting to the proper authorities any revisions to the original notification.

B. The contractor shall be responsible for posting the “Notice of Asbestos Project” signs at the required locations in or on the building. The contractor shall ensure that these signs remain in place throughout the project.

1.4 PROJECT DESIGN AND IMPLEMENTATION

A. The contractor shall be responsible for providing a project design as required by Title 40, Code of Federal Regulations, Part 763.90(g). The project must be designed and conducted by individuals accredited to perform these functions in accordance with Title 40, Code of Federal Regulations, Part 61, Subpart E. The design must be approved by Owner and or their designated representatives prior to work commencing.

B. The project design must incorporate all technical requirements of the specifications and be accepted by the Owner and or their designated representatives prior to work commencing.

C. The asbestos work includes the removal of all asbestos-containing roofing materials identified within these documents and as a result of additional testing by independent third party inspectors. All asbestos-containing material (ACM) abatement shall be conducted in accordance with all applicable Federal and State of Maryland asbestos regulations.

1.5 PROJECT SUBMITTALS

A. For this project, the following paperwork must be completed and submitted to the Owner and or their designated representatives within fifteen (15) working days of notice of award:

1. USEPA and/or State of Maryland asbestos project notification letter.

2. Workers, Supervisors and Inspector AHERA Training Certificate, to include NIOSH 582 Certs. Submit copies of the current training certificates and MD licenses for each person involved in the project.

3. Asbestos Abatement Contractor License.

4. Submit written evidence that the landfill for disposal is approved for asbestos disposal by the EPA, State, and local regulatory agency(s). Submit to Owner and or their designated representatives, waste shipment records prepared in accordance with Federal regulations, signed and dated by an agent of the landfill, certifying the amount of asbestos material delivered to the landfill, within 3 days after delivery.

5. Waste Manifest: Use the asbestos waste tracking system described under Title 40, Code of Federal Regulations 61.15(d). Submit the signed original manifest and one

(1) copy.

B. Submit written results of any air monitoring conducted by or for the contractor during the course of the project (example: OSHA compliance air monitoring).

1.6 TRAINED PERSONNEL

A. All workers and supervisors at the work site must be accredited as per Title 40, Code of Federal Regulations, Part 763, Appendix C to Subpart E. Training courses attended by workers and supervisors to receive the required accreditation must be approved by the State of Maryland.

B. The contractor's on-site supervisor must be a trained "competent person" as per OSHA asbestos construction standard, Title 29, Code of Federal Regulations, Part 1926.1101.

C. The contractor's on-site supervisor must be trained in the provisions of the NESHAP standard, Title 40, Code of Federal Regulations Part 61.

D. The workers and supervisors will be required to have, at all times, on-site evidence of the required AHERA training and Maryland Licensing.

1.7 USE OF SITE

A. At no time shall the contractor's personnel be in public areas (other than the regulated area of the roof and decon area) wearing protective clothing and/or respirators except as part of disposal activities.

PART 2 – EXECUTION

2.1 MATERIALS AND EQUIPMENT

A. A sufficient supply of HEPA filtered vacuum systems, protective clothing, safety equipment (hard hats, safety shoes, gloves, goggles, etc.) and all supplies and equipment necessary to complete the project must be available.

B. Respirators shall be provided in accordance with the submitted written respiratory protection plan. Minimum protection shall be 1/2-face negative pressure respirators equipped with HEPA cartridges.

2.2 EMERGENCY PLANNING

A. The contractor shall develop an Emergency Plan to include fire, electrical hazards, heat related injury, fall protection, and slips, trips and falls.

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1. Employees must understand the emergency procedures.

2. Telephone numbers of all emergency response personnel shall be prominently posted by the contractor.

3. Written Fall Protection plan for work on ladders, scaffolding and elevated surfaces must be provided by the contractor and submitted to Owner and or their designated representatives prior to work commencing.

2.3 PREPARATION

A. Work Area

1. The asbestos-containing roofing materials shall be removed in an intact state to extent feasible. The material must be adequately wet with an amended water solution. Asbestos-containing roofing materials must be lowered to the ground in appropriate packaging, in a manner such that no breakage of material occurs. No visible emissions are to occur from the lowering of the asbestos-containing roofing materials. The asbestos-containing roofing materials are to remain adequately wet at all times.

2. Seal off all entrances and penetrations to the roof (critical barriers) within the designated asbestos Work Area. All exhaust vents, windows, doors, chimneys, and other openings shall be sealed with two layers of 6-mil Polyethylene sheeting.

3. Conduct Roofing removal in accordance with EPA Document 340.B.94.001-Guidance Manual for Asbestos Roofing Removal.

B. Work Area Security

1. The work area is to be restricted only to authorized, trained and protected personnel. The work area must not be accessible to the general public, building occupants, and maintenance and custodial personnel.

2. Restrict entry into the work area by physically isolating the area.

C. Worker Decontamination Facility

1. A worker decontamination facility shall be provided in accordance with 29 CFR 1926.1101.

2. The worker decontamination facility shall consist of at least a clean room, shower room and equipment room.

3. The worker decontamination facility shall utilize 6-mil opaque, black or white polyethylene sheeting or other acceptable materials for privacy.

4. Shower room shall contain one or more showers as necessary to adequately accommodate workers. Each showerhead shall be supplied with hot and cold water adjustable at the tap. The shower enclosure shall be constructed to prevent leakage of any kind. An adequate supply of soap, shampoo and towels shall be supplied by the contractor and available at all times. Shower water shall be drained, collected and filtered through a system with at least 1 micron particle size collection capacity.

5. Two layers of 6-mil polyethylene sheeting shall be used for all floors, walls and ceilings of the decontamination facility.

D. Commencement of Work Shall Not Occur Until:

1. All pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to Owner and or their designated representatives

2. All equipment for abatement, clean-up and disposal are at the job site.

3. All worker training and certification is completed.

4. Contractor receives permission from Owner and or their designated representatives prior to work commencing.

E. Removal Procedures

1. Perform all asbestos abatement in accordance with all applicable Federal and State of Maryland regulations. Asbestos abatement is to be performed utilizing abatement techniques that do not render the ACMs to become friable.

2. During the entire asbestos removal operation, an independent third party Environmental Consultant, **contracted to the asbestos abatement Contractor**, will oversee the work practices and perform sampling for airborne asbestos. A minimum of 5 air samples will be collected each day around and beneath the roof work areas. If at any time, the airborne asbestos level downwind of the work or within the building beneath the work area reaches 0.01 f/cc or greater, the removal must be stopped and an asbestos abatement contractor must be utilized to complete the remaining removal using appropriate asbestos abatement procedures at no additional cost to Owner. All visible debris must be cleaned up immediately if observed .

F. Clean-up Procedures

1. Remove and containerize (2 layers of 6-mil polyethylene) all visible accumulation of asbestos-containing material and asbestos contaminated debris utilizing rubber dustpans and rubber squeegees to move material around. Do not use metal shovels to pick up or move accumulated waste. No brooms are to be brought into the regulated area.

2. Remove all containerized waste from the work area and transport from the work area to the disposal site or temporary storage facility.

3. Decontaminate all tools and equipment and remove at the appropriate time in the cleaning sequence.

4. The work area shall be cleaned until it is in compliance with Federal and State of Maryland requirements and/or any more stringent criteria specified herein. Any additional cleaning cycles shall be provided as necessary, at no cost to Owner, until these criteria have been met.

G. Visual Inspection

1. The Environmental Consultant's on-site representative shall make the final inspection of the roof, inside the building and ground surrounding the building for visual residual debris. If any visual residual debris is observed, it will be assumed to be asbestos and the Contractor shall re-clean the area, at the Contractor's expense.

H. Disposal of Asbestos

1. All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.

2. Immediately collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6-mil thick, cartons, drums or cans). Waste within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Properly decontaminate the waste containers before they leave the containment area. Affix warning and Department of Transportation (DOT) label to each container including the bags or use at least 6-mil thick bags with the approved warnings and DOT labeling preprinted on the bag.

3. The name of the waste generator, the location at which the waste was generated, the Contractor's Asbestos License number, and the date the container was sealed shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with 6-mil plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris in complete. Dispose of waste asbestos material at an EPA or State-approved asbestos landfill.

4. For temporary storage of less than 20 cubic yards of ACM, store sealed impermeable bags in rigid asbestos waste containers for no more than 7 days after completion of the abatement project. Contractor is responsible for securing all waste at time of generation. Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, Section 61.150, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Workers unloading the sealed drums shall wear appropriate NIOSH approved respiratory protection and personal protective equipment when handling asbestos materials at the disposal site.

I. Alternative Procedures

1. Procedures described in this specification must be utilized at all times.

2. Any alternative procedures must be approved by the Owner and or their designated representatives prior to work commencing.

3. The contractor is responsible for obtaining any variance that is required to utilize an alternative procedure. All variances must be received in writing from the State of Maryland before implementing the variance.

J. Safety Data Sheets (SDS)

1. The contractor shall submit Safety Data Sheets (SDS) for all contractor supplies and materials provided under the terms of this proposal in accordance with OSHA communication Standard 29 CFR 1910.1200 and 29 CFR 1926.1101 or any other applicable state, federal, or local regulation.

END OF SECTION

SECTION 02 41 18

SELECTIVE DEMOLITION FOR REROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of designated building equipment and fixtures.

B. Removal of designated construction.

C. Disposal of materials.

D. Identification of utilities.

1.2 SUBMITTALS FOR REVIEW

A. Shop Drawings: Indicate demolition and removal sequence and location of salvageable items as well as; location and construction of temporary work.

1.3 SUBMITTALS FOR CLOSEOUT

A. Project Record Documents: Accurately record actual locations of capped utilities, mechanical systems, electrical power, and plumbing systems.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for demolition work, dust control, and products requiring electrical disconnection and re-connection.

B. Obtain required permits from authorities.

C. Do not close or obstruct egress width to any building or site exit.

D. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

E. Conform to procedures applicable when hazardous or contaminated materials are discovered.

1.5 SCHEDULING

A. Schedule Work to coincide with new construction.

1.6 PROJECT CONDITIONS

A. Conduct demolition to minimize interference with occupied building areas.

B. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Provide, erect, and maintain temporary barriers as needed to protect pedestrian and vehicular presence on the site.

B. Erect and maintain weatherproof closures for exterior openings.

C. Protect existing materials which are not to be demolished.

D. Prevent movement of structure; provide bracing and shoring.

E. Provide appropriate temporary signage including signage for exit or building egress.

3.2 DEMOLITION

A. Disconnect, cap, and identify designated utilities within demolition areas.

B. Demolish in an orderly and careful manner. Protect existing supporting structural members.

C. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

D. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

E. Remove temporary Work.

END OF SECTION

SECTION 04 01 21

MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of masonry restoration work is indicated on drawings and in schedules.

B. Masonry restoration work includes the following:
1. Repointing mortar joints

1.2 QUALITY ASSURANCE

A. Restoration Specialist: The work must be performed by a firm having not less than 5 years successful experience in comparable masonry restoration projects and employing personnel skilled in the restoration processes and operations indicated.

B. Mortar mixing and handling shall be performed by persons who have been trained and certified by manufacturer in historic lime mortar installation, curing conditions and methods, lime putty safety, and all performance characteristics. Contractor shall provide proof of certification for each person employed to handle mortar.

1.3 SUBMITTALS

A. Qualification Data: Qualification data for firm and personnel specified in “Quality Assurance” Article that demonstrates that both firm and personnel have capabilities and experience complying with requirements specified.

B. Product Data: Submit the manufacturer's technical data for each product indicated below including recommendations for their application and use. Include test reports and certifications substantiating that products comply with requirements.
1. Pre-Mixed Mortar

C. Samples:
Prior to commencement of construction, submit samples of the following:
1. Mortar Samples: Submit 4” x 4”x 1/2” dried samples, dated when sample was made along with a detailed description of the mortar or grout mix.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver other materials to the site in manufacturer's original and un-opened containers and packaging, bearing labels as to type and names of products and manufacturers.

B. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

C. Protect mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.5 PROJECT CONDITIONS

A. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, and surrounding buildings from injury resulting from masonry restoration work.

B. Do not repoint mortar joints or repair masonry unless air temperatures are between 40 degrees F and 80 degrees F and will remain so for at least 48 hours after completion work.

C. Prevent mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Remove immediately any mortar that comes in contact with exposed masonry and other surfaces.

1.6 SEQUENCING/SCHEDULING

A. Perform masonry restoration work in the following sequence:

1. Submit samples of mortar. **Allow 1-week for review and approval by the Maryland Historical Trust.**
2. Rake out existing mortar from joints indicated to be repointed.
3. Repoint existing mortar joints where indicated.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS

A. Heritage High Lime Hydrate Type 'O' Mortar, manufactured with white cement, premixed with lime and masonry sand, color to match existing mortar, as manufactured by US Heritage Group, 2900 North Kearsarge Ave, Chicago, Il 60641 or approved equal.

PART 3 – EXECUTION

3.1 ENVIRONMENTAL CONDITIONS

A. Do not perform any masonry application unless air temperatures are between 40 degrees Fahrenheit and 85 degrees Fahrenheit and will remain so for at least 14 days after completion of work. If at any time temperatures are not within this range for the installation (and 14 days after), provide protection by covering and heating (or cooling) the installation. Temperatures and moisture levels must be monitored daily throughout the area of installation for the full 14 days.

B. Wet Weather: Do not apply or mix mortar on outside surfaces with standing water or outside if there is a chance of rain eroding the installed mortar from the building. Masonry receiving mortar should be thoroughly damp but not wet. Provide protection from rain for 72 hours after completion of work, or until surface has hardened sufficiently to repel rain.

C. Cold Weather: Cold weather construction is not allowed when surface temperature of masonry is below 40 degrees F., unless air temperature is expected to be predominately above 40 degrees over the next 14 days.

D. Hot Weather: Mixing should be done in the shade. Cover the mix in hot weather to reduce evaporation. Wherever possible, follow the sun rather than be followed by it throughout the day so that the fresh work shall be shielded from direct sunlight to reduce evaporation. Work shall not be done in full sun at temperatures over 80 F., unless shading is provided.

E. Relative humidity shall be monitored to prevent flash drying, which can occur in hot dry conditions without occasional misting of installed mortar.

F. Wind: More rapid drying can occur at building corners. Hydration of corners must be attended to vigilantly, which may under some conditions require the corners to be protected from strong winds.

G. Spillage: Repair, clean and restore to original condition all materials and finishes that are damaged as a result of contract work to the Architect and Owner's satisfaction at no additional cost to Owner.

3.2 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site and store in manufacturer's original unopened containers and packaging bearing labels as to type and names of products and manufacturer, and which shall show grade, batch, and production data.

B. Deliver, store and handle products and materials to prevent damage, dilution, deterioration, or degradation and intrusion of foreign material. Protect lime products from frost (temperatures below 32 degrees Fahrenheit for more than 24 hours)

3.3 PREPARATION

A. General:

1. Apply protection as required to protect building and surrounding surfaces during masonry restoration operations. Measures include, but are not limited to: protection of building materials; pavement around building; parked cars; vegetation; and adjacent buildings.

3.4 REPOINTING EXISTING MASONRY

A. Joint Raking:

1. Rake out mortar from joints to depths equal to 2-1/2 times their widths but not less than 1/2" nor less than that required to expose sound, un-weathered mortar.
2. Remove mortar from masonry surfaces within raked out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace any masonry units which become damaged.
4. Cut old mortar by hand with chisel and mallet, unless otherwise indicated.

B. Joint Pointing:

1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
2. Point each mortar joint in strict compliance with the mortar manufacturer's written instructions and guidance.
4. When mortar is thumbprint hard, tool joints to a concave profile. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in a damp condition in strict compliance with the mortar manufacturer's instructions.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes:

1. Furnishing and installing rough carpentry, including rough hardware.
2. Rough carpentry consists of wood construction, both temporary and permanent that is not exposed to view in completed building. Rough carpentry work includes proper installation of grounds, wood or metal, nailing strips, blocking, etc., necessary or required to produce an adequate and substantial base for support of finishes, material, fittings and equipment.
3. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated. Types of work in this section include rough carpentry for:
   a. Wood grounds, nailers, blocking and sleepers, including that required for roofing.

1.2 SUBMITTALS

A. Wood Treatment Data:
Fire Retardant Treatment: Include certification by treating plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

1.3 PRODUCT HANDLING

A. Protection:

1. Deliver material to job site and store, in safe area, out of way of traffic and shored up off ground surface.
2. Identify framing lumber by grades and store each grade separately from other grades.
3. Protect metals with adequate waterproof outer wrapping.
4. Use extreme care in offloading lumber to prevent damage, splitting, and breaking of materials.
5. Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks. Do not store materials directly on the ground.

1.4 JOB CONDITIONS

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

PART 2 - PRODUCTS

2.1 LUMBER: GENERAL

A. Factory-mark each piece of lumber with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.

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

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

2.2 MISCELLANEOUS LUMBER

A. Provide Construction Grade light framing size lumber of any species for support or attachment of other work including cant strips, bucks, nails, blocking, furring, grounds, stripping and similar members. Provide kiln-dried lumber with 15% maximum moisture content.

B. Where rough carpentry work is exposed to the weather or, used as blocking or grounds in roofing, or in area of high relative humidity, provide stainless steel structural screw fasteners.

2.3 WOOD TREATMENT

A. Treatment Chemical Manufacturer's: Producer of chemical treatment products shall be recognized for production of wood fire retardant treatments.

B. Treatment Applicator: The fire-retardant treatment application plants shall be licensed and approved by the treatment chemical manufacturer.

C. Fire Retardant Treatment:
   1. Where fire retardant wood is specified provide materials which comply with AWPA Standards for pressure impregnation with fire retardant chemicals, and which have a flame spread rating of not more than 25 when tested in accordance with UL Test 723 of ASTM E 84, and show no increase in flame spread and significant progressive combustion upon continuation of test for additional 20 minutes.
   2. Provide materials which show no change in fire hazard classification when subjected to standard rain test (UL 790 of ASTM B 2898)
   3. Use fire retardant treatment which will not bleed through or adversely affect the type of finish indicated and which does not require brush treatment of field made end cuts to maintain fire hazard classification.
   4. Kiln-dry treated items to maximum moisture content of 19%
   5. Provide UL label on each piece of fire-retardant lumber of plywood.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. All fasteners shall be Type 304 stainless steel.

2.5 OTHER MATERIALS

A. Contractor selects other materials, not specifically described but required for a complete and proper installation, subject to Architect's approval.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
   2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

3. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
4. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

B. Wood Grounds, Nailers, Blocking, and Sleepers:
1. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise show.
3. Provide stainless steel fasteners when anchoring

END OF SECTION

SECTION 07 31 26

SLATE SHINGLES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

The extent of shingles is shown on the drawings and is hereby defined to include natural stone slate units employed as weather protection for roofs.

1.2 REFERENCES

A. Roofing Terminology: Refer to ASTM D-1079 latest edition, and the NRCA Roofing and Waterproofing Manual, latest editions for definitions of terms related to roofing.

1.3 SUBMITTALS

A. Product Data: Submit technical product data for all roofing slates and roofing accessories including underlayment material, nails, and snow guards. Include installation instructions and recommendations from manufacturer. Provide certifications that materials comply with requirements of the Contract Documents.

B. Shop Drawings: Provide details and flashing profiles for construction of roofing transitions and terminations including, but not limited to, hips, gables, ridges, valleys, and eaves as well as attachments of roofing accessories, and gutters.

C. Samples: Submit full range of full-size slate samples for color and texture. Samples shall be the same material, from the same source, as will be used in the work.

1.4 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's recommendations for job site storage and protection for each product used in the work.

B. Deliver slate shingles to the site and store as close as possible to the point of installation to minimize damage while handling.

C. Store and handle roofing materials in a manner that will prevent breakage.

1.5 JOB CONDITIONS

A. Substrate: Proceed with shingle work only after substrate construction and penetrating work have been completed.

B. Weather Conditions: Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommendations for each product being installed, and when substrate is completely dry.

1.6 QUALITY ASSURANCE

Obtain each color of slate from a single quarry capable of producing slate of consistent quality in appearance and physical properties.

1.7 WARRANTY

A. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Installer's Warranty:
   1. Provide Roofing Contractor's written warranty to repair or replace any component of the roofing system, including but not limited to, roofing slates, underlayment, metal flashing, and joint sealers, for a period of (7) years.
   2. Repairs during the warranty shall be made at no cost to the Owner within (48) hours of notification.

PART 2 – PRODUCT

A. General: Provide new, natural stone slate fabricated to shapes for use as roofing shingles. Slate shall be hard, dense, sound rock fabricated to shape with no cracks and no broken corners. Slates shall be punched with (2) nail holes (not drilled) by the manufacturer with a countersunk head on the top side of the shingle. Manufacturer shall cull slate shingles to remove all defective slates prior to shipping.

B. Natural Slate Shingles Materials:
   1. Physical Properties:
      a. Grade S1 in accordance with ASTM C406 latest edition, with breaking load rate at a minimum of 575 pounds, maximum absorption rate of 0.25% and service life rated at over 75 years. Hail Test rating Class 3.
      b. Slate shingles shall be dense and sound, with chamfered edges.
      c. The curvature of slates shall not exceed 1/8” in 12 inches. Shingles having knots or knurls exceeding 1/16” tall on the contact surfaces (top and bottom) shall not be used.
      d. Slate shall be free from ribbons.
      e. Slates with broken corners on the exposed ends shall not be installed.
   2. Color: Gray- Black
   3. Size and Exposure:
      Standard rough texture 1/4" to 3/8” thick, 9” wide by 18” long installed with 7-1/2”” exposure. Shingles shall not differ from these dimensions by more than 1/8” in width or height. Slates shall be trimmed with right angle corners, square to within 1/8” in 12 inches.
   4. Source of Supply:
      All slate shingles shall be from a single source, and from the same quarry, and same location within that quarry.
      a. Greenstone Slate Company: 325 Upper Road, Poultney, Vermont. “Vermont Gray Black” color.
      b. Evergreen Slate Company, 2027 County Route 23, Middle Granville, NY 12849; Color: “Buckingham Black”.
      c. Vermont Slate Company: 2720 Gregory Street, Suite 200, Savannah, Georgia 31404; “CUPA 14” color.

C. Slate Roof Accessories:
   1. Asphalt Saturated Roofing Felt Underlayment:
      No. 30, unperforated organic felt, complying with ASTM D 226, 36" wide.
   2. Waterproof Underlayment:
      Grace Ice and Water Shield roofing underlayment by GCP Technologies or equal.
   3. Nails:
      Large head slaters’ 10-gauge solid copper wire nails, sufficient length to adequately penetrate the roof deck boards, but not less than twice the thickness of the slate plus one inch.
   4. Snow Guards:

Individual cast metal, heavy duty guards, Sieger model 'C', bronze, or approved equal. Units are manufactured with an alloy copper head 3-1/4" high by 5-1/2" wide secured to the roof with an alloy bar strap 3/16" thick x 7/8" wide x 9-1/2" long.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of work.
   1. Examine roof sheathing to verify sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through roofing.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SALVAGING OF EXISTING SLATE SHINGLES :

1. Starting at the top of each roof slope, carefully remove all slate shingles and associated underlayments down to the roof deck and salvage slate for delivery to Owner:
   a. Carefully remove existing slate shingles, one at a time, without breaking or cracking to the maximum extent possible.
   b. Salvage only sound slate – slate that rings true when tapped with one's knuckles, a slate hammer, or other metal object, with nail holes intact, and possessing whole corners. Properly dispose of slate that cannot be salvaged.
   c. Stack salvaged slate at grade, on edge, in wooden slate pallets and cover to protect from the weather.
   d. Pull/remove (do not drive-in) all slating nails and fasteners associated with existing underlayments.

3.3 PREPARATION OF SUBSTRATE

A. Clean substrate of any projections and substances detrimental to shingling work. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with roofing nails.

B. Coordinate installation of shingles with flashing and other adjoining work to ensure proper sequencing. Do not install shingle roofing until all vent stacks and other penetrations through roofing have been installed and are securely fastened.

3.4 COPPER FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Copper Flashing and Trim".

B. Install metal flashings according to recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual".

C. Apron Flashing: Extend lower flange over and beyond each side of down slope slate shingles and up the vertical surface.

D. Step Flashings: Install with a 3-inch head lap extending over the underlying slate shingles and up the vertical surface. Install with lower edge of flashing just upslope of, and concealed by, butt of overlying slate shingle. Fasten to roof deck only.

E. Cricket Flashings: Install against the roof penetrating element, extending concealed flange beneath upslope slate shingles and beyond each side.

F. Hip Flashing: Install centrally over hip with lower edge of flashing concealed by butt of overlying slate shingle. Fasten to roof deck.

G. Open Valley Flashings: Install centrally in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.

H. Rake Drip Edges: Install over underlayment and fasten to roof deck.

I. Eave Drip Edges: Install beneath underlayment and fasten to roof deck.

3.5 INSTALLATION

A. General:
1. Comply with instructions and recommendations of shingle manufacturer, except to extent more stringent requirements are indicated.
2. Sequence construction of slate shingles to avoid traffic on shingles.

B. Roofing Slate Configuration:
Standard Roof: Rectangular shingles with side-to-side butt joints 1/8” wide, staggered minimum 3” from course to course.

C. Underlayment:
Provide one layer of waterproof underlayment 36" wide along the entire perimeter of the roof. Install asphalt felts starting at the upper edge of the waterproof membrane, with a 2” overlap over the waterproof membrane, and with 2” minimum lapping of succeeding courses of felts up to the ridge.

D. SLATE-SHINGLE INSTALLATION
1. Installation, General: Beginning at eaves, install slate shingles according to written recommendations of manufacturer and details and recommendations in NRCA’s “The NRCA Roofing and Waterproofing Manual”.
   a. Install 2-layer shingle starter course chamfered edge down.
2. Install first and remaining shingle courses with chamfered face up. Install full width first course at rake edge.
   a. Offset joint of uniform width slate a minimum of 3 inches in succeeding courses.
3. Maintain a 3-inch minimum head lap between succeeding shingle courses.
4. Extend shingle starter course and first course 2 inches over facia at eaves.
5. Extend shingle starter course and succeeding courses 1 inch over rake edge.
6. Cut and fit slate neatly around projections through roof.
7. Hang slate with two fasteners for each shingle with fasteners lightly touching slate. Do not drive fasteners home drawing slates downward or leave fastener head protruding enough to interfere with overlapping shingle above.
8. Ridges: Install prefabricated, continuous copper ridge with individual copper cleats spaced 24” on center on each side of the ridge. Install cleats with two (2) ring shank copper nails and secure the cleat to the ridge roll with one (exposed) copper rivet.
9. Install three (3) rows of snow guards spaced 18” apart along the row, and (2) courses apart from row to row, with staggered spacing.

3.6 ADJUSTING AND CLEANING

A. Remove and replace damaged or broken slates.

B. Remove excess slate and debris from project site.

END OF SECTION

SECTION 07 53 23

FLEXIBLE SHEET ROOFING
TPO MEMBRANE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of flexible sheet roofing (FSR) is indicated on the drawings and is hereby defined to include non-traffic bearing sheet membrane system intended for weather exposure as primary roofing.

B. Roof insulation related to flexible sheet roofing is specified in this section.

1.2 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 for definition of terms related to roofing work not otherwise defined in this Section.

1.3 QUALITY ASSURANCE

A. Manufacturer:
   1. Obtain primary flexible sheet roofing from a single manufacturer. Provide secondary materials as recommended by the manufacturer of primary materials.
   2. Roofing manufacturer shall be an established manufacturer of roofing materials specified, maintaining technically qualified personnel, in the project area, to review proposed construction, consult at the project site, make detailed recommendations concerning installation procedures, etc.

B. Installer:
   1. A firm with not less than 5 years of successful experience in the installation of roofing systems identical to those required for this project and which is licensed by the manufacturer of primary roofing materials.
   2. Provide written certification from manufacturer of roofing system that Installer is approved by manufacturer for installation of specified roofing system. Submit copy of certification to Architect.
   3. Installer shall maintain a full-time supervisor at the site of the work at all times when roofing work is in progress. Supervisor shall have a minimum of 3 years experience as a supervisor of roofing work.

C. Pre-Roofing Conference: Prior to installation of roofing and associated work, meet at project site with Installer, roofing manufacturer, installers of related work, and other entities concerned with roofing performance, including test agencies, Architect, and Owner.

D. UL Listing:
   1. Provide labeled materials which have been tested and listed by UL for application indicated, with the following rating for roof slopes shown:
      a. Class A rated materials/system

E. Inspection: Upon completion of the installation, a certified technical representative, unrelated to the sales department of the manufacturer or the contractor shall inspect the roofing system to determine that it has been installed according to the Manufacturer's published specifications and details. Upon approval of the project by Manufacturer, a warranty shall be written.

F. Changes or deviations from this Specification shall be approved in writing by Manufacturer, and be acceptable to the Architect.

1.4 SUBMITTALS

A. Product Data: Submit specifications, installation instructions and general recommendations from manufacturers of flexible sheet roofing system materials, for types of roofing required. Include data substantiating that materials comply with requirements.

B. Shop Drawings: Provide roof plan indicating slope direction and insulation layout. Provide details for all penetrations, transitions and terminations of the membrane.

C. Warranty:
1. Provide manufacturer's warranty stating obligations, remedies, limitations, and exclusions.
2. Provide Roofing Contractor's written warranty.

D. Pull-Out Tests (Wood Deck): Submit a complete listing of pull-out tests conducted and the corresponding pull-out values, signed by the representative conducting the test and the Roofing Applicator verifying the accuracy of the test.

E. Adhesion Test: Submit a complete listing of adhesion tests conducted and the corresponding adhesion values, signed by the representative conducting the test and the roofing applicator verifying the accuracy of the test.

F. Certifications:
1. Provide certification of installer by manufacturer.
2. Submit certification that installer is a Manufacturer Approved Applicator.
3. Submit U.L. Class A and FM I-90 references/ approvals for the assembly to be installed.
4. Submit testing or proof of resistance to chemicals or materials that may deteriorate the membrane.
5. Submit certification of ten years experience in the manufacturing of the membrane.
6. Submit proof of a minimum of 4,000,000 Langleys of Emmaqua testing per ASTM G-90.
7. Submit proof of ISO 9002 certification of membrane manufacturing facilities.

G. Manufacturer Certificates: Signed by roofing manufacturer certifying that the roofing system complies with requirements of warranty.

H. Inspection Report: Copy of roofing system manufacturer’s inspection report of completed roofing installation.

1.5 PRODUCT HANDLING, STORAGE AND DELIVERY

A. Deliver material in manufacturer's original containers with labels intact and legible.

B. Deliver bulk shipments with certification of compliance with specifications including melting point, flash point, application temperature, etc.

C. Select and operate material handling equipment and store materials to keep from damaging existing construction or applied roofing.

D. Store rolls of membrane, cartons and drums of adhesives, all cans and drums of cement, primers, and coatings on end.

E. Store materials on clean, raised platforms.

F. Store and handle materials to protect them from:
1. Moisture, whether due to rain, snow, or condensation
2. Damage by construction traffic
3. Temperatures over 110 degrees Fahrenheit
4. Temperatures below 40 degrees Fahrenheit
5. Direct sunlight
6. Mud, dust, sand, oil, grease, and dirt.

Note: Polyethylene is not acceptable as a cover, use opaque tarpaulins.

G. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

H. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

I. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

J. Damaged materials shall be replaced at the Contractor's expense.

K. Immediately remove and dispose of wet materials.

L. Comply with fire, safety, and environmental protection regulations.

M. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.6 WEATHER CONDITIONS

A. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.

B. Do not apply roofing when ambient temperature is below 40 degrees F and substrate, or when wind speed is over 20 miles per hour.

1.7 PROTECTION

A. Avoid heavy traffic on the work during all phases of installation.

B. Replace or restore to original condition any materials or work damaged during construction.

C. Protect exterior building and paving surface with tarpaulins in the area of the work during roofing work, including tear-off areas, hoists, dumpster, dump trucks, etc.

D. Lap protective materials at least 6 inches and secure protective coverings against wind.

E. Leave protective covering in place until roofing work is completed.

F. Protect the building interior from water infiltration at all times. Do not tear off more roofing than can be replaced by the end of the workday.

1.8 MISCELLANEOUS

A. Do not use bitumen base roof cement on FSR system.

B. Do not install FSR membrane directly onto low melting point asphalt.

C. Do not allow waste products, petroleum, grease, oil solvents, vegetable or mineral oil, animal fat, etc. or direct steam venting to come in contact with the membrane.

D. Roof surface shall be free of ponded water, ice, or snow.

1.9 WARRANTY

A. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Manufacturer's Warranty:
   1. The manufacturer of the roofing system shall issue the warranty for a twenty (20) year period with No Dollar Limit on replacement costs. This warranty shall insure that the roofing system installed remains watertight for twenty years after Substantial Completion and that the manufacturer guarantees to correct/repair all leaking roof systems during the warranty period free of charge.
   2. The cost of the manufacturer's warranty shall be included in the Base Bid of the Contract and shall be the sole responsibility of the Contractor to obtain.
   3. The work of the Contract will not be considered Substantially Complete until the manufacturer's warranty is issued, and the work is found to be acceptable to the Owner.
   4. The warranty shall contain no exclusion or limitation for improper installation; or damage from environmental contaminants; or damage from water that ponds, or does not drain freely.

C. Installer's Warranty:
   1. Provide Roofing Contractor's written warranty to repair or replace any component of the roofing system, including but not limited to, roof membrane, insulation, flashing, metal coping, metal fascia and metal flashing, for a period of 5 years.
   2. Repairs during the warranty shall be made at no cost to the Owner within (48) hours of notification.

PART 2 - PRODUCTS

2.1 GENERAL

A. Performance: Provide roofing materials recognized to be of generic type indicated and tested to show compliance with indicated performances, or provide other similar materials certified in writing by manufacturer to be equal or better than specified in every significant respect, and acceptable to the Architect.

B. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

2.2 ADHERED FSR SYSTEM

A. Thermoplastic Polyolefin

1. TPO Membrane: TPO (thermoplastic Polyolefin) w/ a 1000 denier polyester weft inserted reinforcement flexible sheet fully adhered roofing system.
2. Manufacturer's standard thickness but not less than .080 inches, 30% minimum elongation (ASTM D751), ultraviolet and ozone resistant, low temperature brittleness of -40 degrees F (ASTM D2137), in standard tan color, all in compliance with ASTM D 4637 Type I.
3. Radiative Properties for Energy Star, and LEED

	Test Method	Tan TPO
Energy Star – Initial solar reflectance	Solar Spectrum Reflectometer	0.71
Energy Star – Initial solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.64
CRRC – Initial solar reflectance	ASTM C1549	0.71
CRRC – Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.64
CRRC – Initial thermal emittance	ASTM C1371	0.86
CRRC – Thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.87
LEED – Thermal emittance	PASS	0.86
SRI – Initial (Solar Reflectance Index)		86
SRI – 3 year aged (Solar Reflectance Index)		77

4. Products: Subject to compliance with the specified requirements, provide flexible sheet roofing system; "UltraPly Platinum TPO" from Firestone Building Products, "Sure-Weld Adhered TPO" from Carlisle Syntec", (Basis of Design),and "VersiWeld Adhered TPO" from Versico or approved equal.
5. Membrane Color: Tan.

2.3 MISCELLANEOUS MATERIALS FOR FSR

A. General: Furnish auxiliary materials recommended by roofing system manufacturer for intended use and compatible with FSR membrane roofing, including color.

B. Flashing: 60 mil thick TPO, cured or un-cured according to application. For field fabricated vent stacks, pipes and corners provide unreinforced 55 mil thick Ethylene propylene. Color: Tan.

C. Sheet Seaming System: Manufacturer's heat welded standard for sealing lapped joints, including edge sealer to cover exposed spliced edges as recommended by manufacturer of FSR system.

D. Bonding Adhesive: Type recommended by manufacturer for FSR membrane for particular substrate and project conditions, and formulated to withstand minimum 60 psf uplift force.

E. All caps are to be heat welded.

F. Cut Edge Sealant: Manufacturer's standard single component sealant.

G. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

H. Metal Termination Bars: Manufacturer's standard aluminum bars, approximately 1 inch wide, roll formed and pre-punched.

I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, and other accessories recommended by roofing system manufacturer for intended use.

J. Molded Pipe Flashing: Provide factory fabricated molded pipe flashing compatible with FSR membrane and furnished by FSR manufacturer for each pipe penetration of the roofing system.

K. Walkway Pads: Provide roof material manufacturer's standard walkpad, 34" x 10' x 80 mil, thick rolls, for installation with splice adhesive to the roof membrane.

2.4 INSULATION

A. General: Provide preformed, roofing insulation boards that comply with requirements, selected from manufacturer's standard sizes and of thicknesses indicated. Insulation system shall include preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

B. Polyisocyanurate insulation shall be manufactured utilizing "Zero ODP" pentane blowing agents complying with ASTM C 1289-02, and classified by facer type as follows:
   1. Facer Type: Type II, felt or glass-fiber mat on both major surfaces.
   2. Flat Polyiso board Insulation: Where indicated on the drawings as flat insulation provide flat, rigid, cellular polyiso thermal insulation with a total LTTR R-Value of 32.7 and thickness of five-point-six-five (5.65") inches. Carlisle SecurShield POLYISO, or approved equal.
   3. Tapered Polyiso Board Insulation: Where indicated on the drawings as tapered insulation provide 1/8" slope, rigid, polyiso thermal insulation with a minimum LTTR R-Value of 32.7 and thickness of five-point-six-five (5.65") inches at low points.
   4. Tapered crickets as indicated on drawings or where needed for positive drainage shall be sloped to meet roof conditions with a minimum thickness of ½".

C. High-Density Cover Board: Where indicated as "high-density cover board" on the drawings, provide high-density, closed-cell polyiso foam core with coated fiberglass facer, and minimum LTTR R-Value of 2.5 with thickness of 1/2". Carlisle SecurShield HD Plus POLYISO, or approved equal.

D. Insulation and Overlay Board Adhesive: Manufacturer's recommended adhesives for non-penetrating system applications. Carlisle Flexible FAST, or approved equal.

2.5 INSULATION ACCESSORIES

A. General: Furnish roofing insulation accessories recommended by insulation manufacturer for intended use and compatible with sheet roofing material.

B. Fasteners:
   1. Wood Deck: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470, designed for fastening roofing insulation to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer. Provide fasteners with factory applied white finish.

PART 3 - EXECUTION

3.1 PRECAUTIONS AND PROTECTION OF STRUCTURE

A. Limitations of Roof Load:
The Contractor shall be responsible for limiting the imposed loads on the building structure. This includes dead loads and live loads resulting from, but not limited to:
1. the storage of materials, supplies, and equipment
2. personnel on the roof
3. impact loads from transport equipment

B. Restrictions on Equipment: The Contractor shall not use motorized vehicles or equipment on the roof that incorporate a cab for the operator; such as a Bobcat front end loader.

3.2 DEMOLITION OF EXISTING ROOFING

A. General:
1. Contractor shall comply with all requirements related to the removal of existing hazardous materials.
2. Cut existing roofing for demolition, do not use axes or impact tools.
3. Remove existing roofing and insulation material completely. Where indicated on the drawings remove existing metal flashing.
4. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.
5. Protect existing roof drains from being clogged with debris at all times.
6. Proceed with demolition in systematic manner. Do not remove more roofing than can be replaced before the end of daily operations.
7. Make the roof system weatherproof and waterproof at the end of each day's operations.
8. Conveyances: Contractor shall transport demolition debris across roof in vehicles that will not damage or overload the roof deck.
9. Clean all debris from decks.

B. Demolition Plan: The Contractor shall submit a detailed roofing demolition plan that describes the equipment and methods to be used, refuse storage and removal processes, and the proposed disposal methods. The plan shall also include methods for protecting the building interior and exterior, traffic control, occupant protection, and security of the construction site.

C. Demolition Equipment and Methods:
1. Scrape off existing roofing, do not use axes or impact tools.
2. Roof cutting power tools shall be equipped with operable blade depth setting mechanisms which shall control the cutting depth of the blade. The Contractor shall take every precaution to avoid cutting the decking. The Contractor shall repair all decking that is damaged by the demolition operation at the Contractor's expense.
3. The use of "bobcat" type removal equipment is prohibited.
4. The Contractor shall provide chutes for debris to be transferred to containers at grade. Protect the wall behind and adjacent to chute locations with tarpaulins.
5. Removed materials shall not be thrown freely from the roof but shall be lowered to the ground by mechanical devices or in an enclosed chute. Contractor shall minimize the spread of dust and debris.

D. Disposal of Demolished Materials:
1. Remove from site all debris, rubbish, and other materials resulting from demolition operations.

2. Transport materials removed from demolished structures and dispose of off-site in accordance with regulations and authorities having jurisdiction.
3. Contractor shall submit to the Owner for approval, all crane and refuse container locations. The Contractor shall repair any lawns or paving damaged during the Contract to original, or better, condition.

3.3 PREPARATION OF SUBSTRATE

A. Comply with manufacturer's instructions for preparation of substrate to receive system, except where more stringent requirements are indicated.

B. Clean substrate of dust, debris, and other substances detrimental to new work. Remove sharp projections.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

D. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of the roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Install flashings, and accessory items as shown, and as recommended by the manufacturer even though not specifically shown.

F. Verify that work requiring penetration of the deck, or that requires men and equipment to travel over the roof deck has been completed.

G. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.

H. Confirm that all surfaces are adequately anchored, even and free of any foreign material, moisture, or un-evenness.

I. Immediately notify the Architect of any defects. Do not apply the roofing system until these defects have been corrected.

J. Verify that curbs and nailers are in place and properly installed.

3.4 PULL OUT TESTS (Wood deck)

A. Conduct (6) pull-out tests in accordance with manufacturer’s instructions for every 10,000 square feet of roofing, but not less than (6) tests on each building.

3.5 ADHESION TESTS

A. Conduct (6) adhesion tests in accordance with manufacturer’s instructions for every 10,000 square feet of roofing, but not less than (6) tests on each building.

3.6 INSULATION INSTALLATION

A. General:
   1 Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
   2. Comply with roofing system manufacturer’s written instructions for installing roofing insulation.

3. Extend insulation full thickness over the entire surface to be insulated, cutting and fitting tightly around obstructions. Form crickets, saddles, and tapered areas with additional material as shown and as required for proper drainage of membrane.
4. Do not use any damaged or wet insulation boards.
5. Install insulation boards with not more than 1/4" gap between boards.
6. Poorly adhered boards and boards with more than 1/4" gap shall be removed and replaced.
7. Do not install more insulation each day than can be covered with membrane before end of day and before start of inclement weather.
8. Install tapered insulation under area of roofing to conform to slopes indicated and to Shop Drawings.
9. Install tapered crickets wherever required to provide positive drainage around roof top equipment and accessories, whether shown on the drawings or not.
10. Install multiple layers of insulation under area of roofing to achieve required thickness. Joints are to be staggered between rows and layers.
11. Trim surface of insulation where necessary at roof drains so completed surface is flush with ring of drain.
12. Install insulation with long joints of insulation in continuous straight lines with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding ¼ inch (6 mm) with insulation.
    a. Cut and fit insulation within ¼ inch (6 mm) of nailers, projections, and penetrations.

B. Wood Deck Installations:
1. Attached Insulation: Install the first layer of insulation by securing to the deck using mechanical fasteners specifically designed and sized by the manufacture for fastening specified board – type roofing insulation to the existing deck. Install the subsequent layers of insulation to the first layer of insulation using the two component urethane adhesive in accordance with the manufactures specification.
2. Install the overlay board to the top surface of the polyiso insulation using the two component urethane adhesive in accordance with the manufacturer’s specifications.

3.7 FSR INSTALLATION

A. General:
1. Comply with manufacturers' published instructions, except where more stringent requirements are indicated.
2. Prevent compounds from entering and clogging drains and conductors, and from spilling or migrating onto surfaces of other work.

B. Adhesive Adhered FSR:
1. Install membrane by unrolling over prepared substrate, lapping adjoining sheets as recommended by manufacturer. Apply adhesive to surfaces to be bonded and roll FSR into place when adhesive has properly cured. Cut edges are to be sealed after seams have been welded.
2. Install mechanical fasteners, flashings and counterflashings, and accessories at locations and as recommended by manufacturer.
3. Install FSR sheet over area to receive roofing according to roofing system manufacturer’s written instruction. Unroll sheet and allow to relax for minimum of 30 minutes.
4. Start installation of sheet in presence of roofing system manufacturer’s technical personnel.
5. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

6. Apply bonding adhesive to substrate and underside of sheet at rate required by manufacturer and allow to partially dry. Do not apply bonding adhesive to splice area of sheet.
7. Mechanically or adhesively fasten sheet securely at terminations and perimeter of roofing.
8. Apply roofing sheet with side laps shingled with slope of roof deck where possible.
9. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing sheet in place with clamping ring.

3.8 SEAM INSTALLATION

A. Clean both faces of splice areas, heat weld laps of overlapping sheets according to manufacturer's written instructions to ensure a watertight seam installation.

B. Repair tears, voids, and lapped seams in roofing that does not meet requirements.

3.9 FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of flashing sheet at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with FSR flashing as recommended by manufacturer.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top sheet flashings.

F. Mechanically anchor flashing to substrate through termination bars.

3.10 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
   1. Notify Architect or Owner 48 hours in advance of the date and time of inspection.

3.11 PROTECTION AND CLEANING

A. Protect sheet membrane roofing from damage and wear during remainder of construction period.
B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.
   1. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of each type of flashing and sheet metal work is indicated on the drawings and by provisions of this section.

B. The types of work specified in this section include the following:
   1. Metal wall flashing
   2. Prefabricated Roof Edge Fascia Units
   3. Reglets

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications, installation instructions and general recommendations for each specified sheet material and fabricated product.

B. Shop Drawings: Submit shop drawings showing layout, joining, profiles, and anchorages of fabricated work, including major counter flashings, trim/facia units, gutters, downspouts, scuppers and expansion joint systems; layouts at ¼" scale, details at 3" scale.

C. Samples: Submit two, 8" square samples of specified sheet materials to be exposed as finished surfaces.

D. Job Conditions: Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protect of materials and finishes.

PART 2 – PRODUCTS

2.1 FLASHING AND SHEET METAL MATERIALS

A. Stainless Steel: AISI Type 302/304, ASTM A 167, 2D annealed finish, soft except where harder temper required for forming or performance; 0.015" thick (28 gage) except as otherwise indicated.

B. TPO Coated Metal: Provide manufacturer's TPO coated metal with continuous 20-gauge metal wind cleat, as shown on details; color to match TPO membrane.

2.2 FORMED UNITS

A. General Metal Fabrication: Shop fabricate work to the greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder.

C. Expansion Provision: Where lapped or bayonet type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).

D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with industry standards.

E. Separation: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

F. Aluminum Extrusion Units:
   1. Fabricate extruded aluminum running units with formed or extruded aluminum joint covers, for installation behind main members.
   2. Fabricate mitered and welded corner units.

2.3 FABRICATED METAL ROOFING ACCESSORIES

A. Aluminum Fascia
   1. Manufacturer's standard sizes and profiles or as indicated on the drawings, Kynar 500 finish, 0.050 minimum thickness for primary legs of extrusions.
   2. Provide prefabricated system including preformed coping, 6" splice plates, and 24 gauge hold cleats with integral neoprene compression pads. Splice plates shall be treated with factory applied sealant beads. Provide "SecurEdge 2000" fascia system by Carlisle Syntec Systems or approved equal.
   3. Color: Color to be selected from manufacturer's standard colors to match existing stone coping.

B. Reglet:
   1. Surface Reglets: Stainless Steel, type "304-0.020" Fry Reglet 'SM' and spring lock flashing or approved equal.

2.4 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Fasteners: Stainless steel structural screw fasteners.

B. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.

PART 3 – EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

B. Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a course of paper slip sheet and a course of polyethylene underlayment.

C. Installation:
   1. Reglet

a. Install reglet and counter flashing in accordance with approved shop drawings and manufacturer's product data to comply with specified performance requirements. Reglet and counter flashing components shall be true to line, without buckling, creasing, warp or bin in finished surfaces.
b. Coordinate counter flashing at roof surfaces with roofing work to provide weather tight condition at roof terminations.
c. Isolate dissimilar materials to prevent electrolysis. Separate bituminous coating.
d. Secure reglets and counter flashing using continuous cleats, clips and fasteners in accordance with product data and as indicated.

2. Install counterflashing in reglets, by snap-in seal arrangement, as indicated by manufacturer.
3. Install parapet caps and metal edge details in accordance with manufacturers requirements and recommendations.
4. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6". Complete seams at joints between units, to form a continuous waterproof system.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

B. Contractor shall protect sheet metal and flashing work during construction to ensure that work will not be damaged.

END OF SECTION

SECTION 07 62 15

COPPER FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes shop and field formed copper accessories and trim, such as:
   1. Counterflashing and base flashing.
   2. Wall flashing.
   3. Exposed trim units.
   4. Miscellaneous accessories.

1.2 COORDINATION

A. Coordinate work of this section with interfacing and adjacent work for proper sequencing. Ensure weather resistance and durability of work and protection of materials and finishes.

1.3 PERFORMANCE REQUIREMENTS

A. Installation Requirements: Fabricator is responsible for installing system, including anchorage to substrate and necessary modifications to meet specified and drawn requirements and maintain visual design concepts in accordance with Contract Documents and following installation methods as stipulated in the "Copper in Architecture" handbook published by the Copper Development Association (CDA).
   1. Drawings are diagrammatic and are intended to establish basic dimension of units, sight lines, and profiles of units.
   2. Make modifications only to meet field conditions and to ensure fitting of system components.
   3. Obtain Architect's approval of modifications.
   4. Provide concealed fastening wherever possible.
   5. Attachment considerations: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between units and building structure or between components themselves.
   6. Obtain Architect's approval for connections to building elements at locations other than indicated in Drawings.
   7. Accommodate building structure deflections in system connections to structure.

B. Performance Requirements:
   1. System shall accommodate movement of components without buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects when subjected to seasonal temperature changes and live loads.
   2. Design system capable of withstanding building code requirements for negative wind pressure.

1.4 SUBMITTALS

A. Product data for flashing, metal, and accessories: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

1.5 QUALITY ASSURANCE

A. Fabricator's Qualifications: Company specializing in copper flashing and trim work with three years experience in similar size and type of installations.

B. Installer: A firm with 3 years of successful experience with installation of copper flashing and trim work of type and scope equivalent to Work of this Section.

C. Industry Standard: Except as otherwise shown or specified, comply with applicable recommendations and details of the "Copper in Architecture" handbook published by the Copper Development Association (CDA). Conform to dimensions and profiles shown.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing, Shipping, Handling, and Unloading: Protect finish metal faces.

B. Acceptance at Site: Examine each component and accessory as delivered and confirm that material and finish is undamaged. Do not accept or install damaged materials.

C. Storage and Protection:
   1. Stack pre-formed material to prevent twisting, bending, and abrasions.
   2. Provide ventilation.
   3. Prevent contact with materials which may cause discoloration or staining.

1.7 WARRANTY

A. Warrant installed flashing, copings, gravel stops, and trim components to be free from defects in material and workmanship for period of 2 years.

B. Include coverage against leakage and damages to finishes.

PART 2 - PRODUCTS

2.1 FLASHING AND TRIM MATERIALS

A. Copper Sheet: ASTM B370; temper H00 (cold-rolled) except where temper 060 is required for forming; 16 oz. per sq. ft. (0.0216-inch thick) (0.55 mm) except as otherwise indicated.

B. Prefabricated Ridge Roll Cap: 20 ounce copper prefabricated tubular round top with flanges both sides fabricated from 12" wide sheet; installed with 40 ounce copper cleats (separate cleats both sides of ridge).

2.2 ACCESSORIES

A. Solder: ASTM B32; Provide 50-50 tin/lead or lead free alternative of similar or greater strength solder.

B. Flux: Muriatic acid neutralized with zinc or approved brand of soldering flux.

C. Fasteners: Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

D. Bituminous Coating: SSPC - Paint 12, Cold-Applied Asphalt Mastic (Extra Thick Film), nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

E. Joint Sealant: One-part, copper compatible elastomeric polyurethane as tested by sealant manufacturer for copper substrates.

F. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of and compatibility with flashing sheet.

G. Paper Slip Sheet: Minimum 4-lb. red rosin-sized building paper.

2.3 FABRICATION

A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of Copper Development Association (CDA) "Copper in Architecture" handbook and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed copper work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
   1. Fabricate to allow for adjustments in field for proper anchoring and joining.
   2. Form sections true to shape, accurate in size, square, free from distortion and defects.

3. Cleats: Unless otherwise noted, fabricate cleats of same material as sheet, interlockable with sheet in accordance with CDA recommendations.
4. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; solder for rigidity if required; seal non-soldered weather joints with sealant.

B. Seams: Fabricate nonmoving seams with flat-lock seams where possible. Tin edges and cleats to be seamed, form seams, and solder. Where soldered flat-lock seams are not possible, use soldered riveted lap seams joints for additional strength.

C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1-inch (25 mm) deep, filled with mastic sealant (concealed within joints).

D. Sealant Joints: Where movable, nonexpansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with CDA standards.

E. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

F. Solder
1. Solder and seal metal joints except those indicated or required to be expansive type joints.
2. Tin edges of copper sheets and cleats at soldered joints.
3. After soldering, carefully remove flux and other residue from surfaces. Neutralize acid flux by washing with baking soda solution, and then flushing clear water rinse. Wipe and wash solder joints clean.

G. Seams:
1. Provide following seam types unless noted or detailed otherwise.
2. Flat: Flat lock.

H. Copper Thickness: Copper: ASTM B370; temper H00 (cold-rolled) except where temper 060 is required for forming;
1. 16 oz. per sq. ft. (0.0216-inch thick) (0.55 mm) except as otherwise indicated.

I. Flashing and Counter Flashing:
1. Fabricate as indicated on Drawings and in accordance with the CDA "Copper in Architecture" handbook.
2. Hem exposed flashings on underside 1/2 inch (13 mm); miter and seam corners.
3. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
4. Fabricate flashings to allow toe to extend minimum 2 inches (50 mm) over wall surfaces.
5. Fabricate metal flashings at open valleys with a minimum 1 inch (25 mm) high standing rib at center of valley to break force of water flow.

2.4 FINISHES

A. Natural weathering mill finished copper. No applied finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Examine conditions and proceed with work when substrates are ready.

B. Confirm that substrate system is even, smooth, sound, clean, dry, and free from defects.

3.2 INSTALLATION

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with the "Copper in Architecture" handbook published by the Copper Development Association (CDA). Anchor units of work securely in place by methods indicated, providing for thermal expansion of units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.
   1. Install units plumb, level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction.
   2. Apply asphalt mastic on copper surfaces of units in contact with dissimilar metals.
   3. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
   4. Miter, lap seam and close corner joints with solder. Seal seams and joints watertight.
   5. Install expansion joints at frequency recommended by CDA. Do not fasten moving seams such that movement is restricted.
   6. Coordinate with installation of roofing system and roof accessories.

B. Underlayment: Where installation is to be directly on cementitious or wood substrates, install red rosin paper slip sheet over layer of asphalt saturated felt.

C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

D. Counterflashing and Reglets:
   1. Fabricate counterflashings and reglets as 2 piece assemblies to permit installation of counterflashing after base flashings are in place.
   2. Fabricate reglets of same metal and thickness as counterflashings.
   3. Overlap roof base flashing 4 inches (100 mm) minimum.
   4. Install bottom edge tight against base flashing.
   5. Lap seam vertical joints 3 inches (75 mm) minimum and apply sealant.

E. Install counterflashing in reglets, either by snap-in seal arrangement, lock seal in accordance with the "Copper in Architecture" handbook published by the Copper Development Association (CDA), or by soldering in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.

F. Fasten flashing to curb nailers at maximum spacing of 3 inches (75 mm) O.C. Fabricate seams at joints between units with minimum 4-inch (100 mm) overlap, to form continuous, waterproof system in accordance with the "Copper in Architecture" handbook published by the Copper Development Association (CDA).

G. Ridge Cap: Install prefabricated ridge roll cap with individual cleats both sides of ridge, 12" on center. Install cleats with ring shank copper nails. Lap and seal ridge cap joints.

3.3 CLEANING

A. Remove protective film (if any) from exposed surfaces of copper promptly upon installation. Strip with care to avoid damage to finishes.

B. Clean exposed copper surfaces, removing substances that might cause abnormal discoloration of metal.

C. Upon completion of each area of soldering, carefully remove flux and other residue from surfaces. Neutralize acid flux by washing with baking soda solution, and then flushing with clear water rinse. Use special care to neutralize and clean crevices.

D. Clean exposed metal surfaces of substances that would interfere with normal oxidation and weathering.

3.4 PROTECTION

A. Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

END OF SECTION

SECTION 07 92 00

JOINT SEALERS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The applications for joint sealers as work of this section include the following:
   1. Exterior flashing and facia joints

1.3 GENERAL PERFORMANCE REQUIREMENTS

Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

1.3 JOB CONDITIONS

A. Weather Conditions: Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants when temperature is in lower third of temperature range recommended by the manufacturer for installation.

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this Section with a minimum of 20 continuous years of documented experience.

B. Installer: Company specializing in installation of work in this Section with a minimum 5 continuous years of documented experience and approved by sealant manufacturer.

C. Comply with Sealant and Waterproofers Institute requirements for materials and installation.

1.5 WARRANTY

A. Provide 20-year warranty.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. General: Manufacturers listed in this article include those known to produce the indicated category of prime joint sealer material, either as a nominally pure generic product or as an equivalent performance modification thereof or proprietary product.

B. Manufacturer:
   Subject to compliance with requirements, provide products of one of the following:
   1. Euclid Chemical
   2. W.R. Meadows
   3. Pecora Corp.
   4. Sonneborn/Contech
   5. Tremco, Inc.

2.2 SEALER MATERIALS

A. General Sealer Requirements: Provide colors indicated or, if not otherwise indicated, as selected by the Architect from the manufacturer's standard colors. Select materials for compatibility with joint surfaces and other indicated exposures, and except as otherwise indicated select modulus of elasticity and hardness or grade recommended by the manufacturer for each application indicated. Where exposed to foot traffic, select non-

tracking materials of sufficient strength and hardness to withstand stiletto heel traffic without damage or deterioration of sealer system.

B. Single Component Polyurethane: Single component, gun grade, modified polyurethane sealant for exterior exposures meeting Federal Sepcification TT-S-00230C, Type II, Class A; and ASTM C920, type S, Grade NS, Class 35, Use NT, M, A, and O. Provide Tremco "Dymonic FC Hybrid" or approved equal.

2.3 CELLULAR/FOAM JOINT FILLERS AND SEALANT BACKERS

A. Closed Cell Synthetic Rubber Joint Filler: Provide expanded synthetic rubber complying with ASTM D1056, class SC-E of 2 to 5 psi compression deflection; except provide 13 to 17 psi compression deflection where filler is applied under sealant exposed to traffic.

B. Fiber Expansion Joint: Preformed cellular fiber complying with ASTM D1751.

2.4 MASKING TAPE

For masking around joints, provide masking tape complying with Fed Spec UU-T-106C.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 JOINT PREPARATION

A. Clean joint surfaces immediately before installation of sealants. Remove dirt, insecure coatings, moisture and other substrates which could interfere with seal of the sealant.

B. Aluminum surfaces:
   1. Aluminum surfaces in contact with sealant:
      a. Remove temporary protective coatings, dirt, oil, and grease.
      b. When masking tape is used for protective cover, install tape just prior to applying sealant.
   2. Use only nonstaining solvents to remove protective cover, as recommended for that purpose by manufacturer of aluminum work.

3.3 INSTALLATION

A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

B. Set joint filler units at depth or position in joint as indicated to coordinate with other work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between ends of joint filler units.

C. Install sealant backer rod for liquid applied sealants, except where shown to be omitted or recommended to be omitted by the sealant manufacturer for application indicated.
   1. Use only backup material recommended by sealant manufacturer and approved by Architect for particular installation, compressing backup material 25% to 50% to achieve positive and secure fit
   2. When using backup of tube or rod stock, avoid lengthwise stretching of material. Do not twist or braid hose or rod backup stock.

D. Thoroughly and completely mask joints where appearance of sealant on adjacent surfaces would be objectionable.

E. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

F. Equipment:
   1. Apply sealant under pressure with power-actuated or hand gun or other appropriate means.
   2. Use guns with nozzle of proper size, providing sufficient pressure to completely fill joints as designed.

G. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.

H. Do not allow sealants or compounds to overflow from confines of joints, or to spill onto adjoining work, or to migrate into voids of exposed finishes. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

3.4 CLEANING UP

A. Remove masking tape immediately after joints have been tooled.

B. Clean Adjacent surfaces free from sealant as installation progresses, using solvent or cleaning agent sealant manufacturer recommends.

3.5 CURE AND PROTECTION

Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Replace or restore sealants which are damaged or deteriorated during construction period.

END OF SECTION