TOWN OF COHASSET

PAUL PRATT LIBRARY
ROOF REPLACEMENT
&
RESTORATION

TECHNICAL SPECIFICATIONS
ROOF REPLACEMENT, RESTORATION & RELATED WORK

TOWN OF COHASSET
PAUL PRATT LIBRARY
35 RIPLEY ROAD
COHASSET, MA 02025

August 2, 2022

Prepared For:
The Town of Cohasset
41 Highland Ave
Cohasset, MA 02025

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1A.00 PROJECT SITE

A. The physical/site address of the project is located at 35 Ripley Road, Cohasset, MA 02025.

1A.01 TIME FOR COMPLETION

A. In accordance with Section 00700, GENERAL CONDITIONS, the work shall be completed in the timeframe stipulated, following issuance of contract and completed by December 31, 2022.

1A.02 COMMUNICATIONS

A. All notices, demands, requests, instructions, approvals, and claims must be in writing.

B. Any such notice shall be deemed to have been given as of the time of delivery, or of actual receipt in the case of express deliveries, or in the case of mailing, when it should have been received in due course of post.

C. For communicating purposes, the office address of the Contractor shall be that stated on the signature page of the contract; that of the Owner shall be as stated in the Notice to Contractors. Any subsequent change in address of either party shall be communicated to the other in writing.

D. Project decisions shall be made by the appropriate staff at the Town of Cohasset Facilities Department.

1A.03 PLANS AND SPECIFICATIONS

A. The Owner will furnish to the Contractor, without charge, electronic-copies of technical plans/specifications. Reproduction, printing and plotting costs are to be borne by the Contractor.

1A.04 WORK BY THE OWNER (See Section 01010)

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1A.10 DRAWINGS AND SPECIFICATIONS

A. The drawings and specifications attached herein, and such drawings and specifications as may be issued by the Owner shall constitute an integral part of this section and shall serve as the working project documents.

B. Drawings shall not be scaled. Field verification, prior to the submission of Bids, is required to confirm actual locations, dimensions, roof construction/composition and levels. Verify that all existing conditions, as shown, are suitable to receive the work intended. Notify the Owner of any discrepancies before beginning the work that is in question. Renovation work requires careful examination before bidding. No compensation will be granted for additional work caused by unfamiliarity with site conditions that are visible or readily construed by experienced observers. Unless noted otherwise, new or patched work shall match prevailing adjacent existing work.

C. All items not specifically mentioned in the specifications or noted on the drawings, but which are obviously necessary to make a complete working installation, shall be included.

D. It is the intent of these Contract Documents to require a complete project, with all components complete, furnished in appearance, fully operational and suitable for its intended purpose. If the documents fail to carry out a part of the work required for a complete job, advise the Owner in writing before bid-submission. Otherwise, provide all work required to meet these requirements.

1A.11 MATERIALS

A. Whenever a manufacturer’s name or style number is used, it shall be indicative of a required component. Other products/supplies which are generically-referenced are to be carefully-reviewed and submitted to the Owner for approval. In all cases, approval must be obtained in writing from the Owner for final selection of any such materials and/or services. The Owner's decision shall be final with no appeal there from.

1A.12 WARRANTIES AND INDEMNIFICATION

A. In addition to other guarantees or warranties required under law or other sections of the specification, the Contractor warrants all materials furnished and labor performed under this Contract to be free from defects or errors in workmanship or installation for a period of two (2) years from the date of Substantial Completion of work, as certified by the Owner, except that for items of work not completed at the time of Substantial Completion, the warranty period shall be for two (2) years from completion of those items of work. The Contractor shall indemnify the Owner for the full cost of any damage to the property that may result by reason of such defects or errors and shall indemnify the Owner from and against any and all claims, demands, losses, costs, expenses, liabilities, and damages, including

reasonable attorney's fees and expenses, arising out of claims on account of this Contract, including but not limited to claims brought against the Owner for alleged infringement of patents based upon any methods of construction of application or upon materials furnished under the Contract.

1A.13 LICENSING

1A.14 OWNER COORDINATION

1A.15 AWARD OF CONTRACT

A. A Contract shall be awarded by the Owner, as it deems to be in its best interest, to the lowest eligible and responsible bidder.

The awarded bidder will be required to enter into a Construction Agreement with The Town of Cohasset. During the selection process, the Owner may provide the Contractor with their standard Construction Agreement template which includes The Town of Cohasset's standard terms & conditions and insurance requirements. It will be necessary for the Contractor to review the Terms and Conditions presented by the Owner prior to entering into the Contract with the Owner.

1A.16 COMPLETE COST

A. The Proposed Contract Price shall be complete costs, including overhead, profit, insurance, transportation, and all other costs connected with, or incidental to, the work described.

B. Submitted costs shall also include the price for all permits, fees and sales tax. The building permit is to be procured/obtained by the Contractor.

1A.17 HOURS OF OPERATION

A. Work hours on site are 7:00 AM to 5:30 PM Monday through Friday unless otherwise approved by the Owner in writing.

B. Specific restrictions and/or alterations to available work-hours may be generated by the Owner, based-on specific requirements of the Owner's operations. Any such modification of change in the available work-hours will be described to the Contractor in-advance. Specific requirements that mandate the execution of the work off-hours, on weekends or holidays, or other forms of premium time, will be discussed and negotiated with the Contractor.

C. There may be limited specific activates which require reduced noise. Coordinate activities with Owner or Owners Representative.

END OF SECTION

DIVISION 1

SECTION 010100 SUMMARY OF WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings to require that the specified construction be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 DESCRIPTION OF WORK - GENERAL

A. The work of the Contract generally consists of the restoration of the upper EPDM flat roof with an AlphaGuard Roof Restoration system, the lower flat roof will be removed and replaced with a 2-ply modified bitumen roof assembly. Ancillary and associated work involves miscellaneous carpentry, plumbing, rooftop accessories and sheet-metal fabrications.

1. The Town of Cohasset Paul Pratt Library is a multi-story structure located at 35 Ripley Road, Cohasset, MA 02025.

2. Access to the roof areas will be from the contractor provided ladders or stair tower staging adjacent to the Project Site. Coordinate access with Owner or Owner’s Representative. Except as specifically-identified above, no personnel are allowed to enter any portion of the building-interior, without an escort from the Owner’s designated representative.

3. The operations inside this facility will be in full and active service/use while roofing work is proceeding. Coordinate with the Owner or owner’s Representative each day.

B. The work of the project includes, but is not entirely limited to, the following:

1. Restore the upper flat roof section with an AlphaGuard Roof Restoration System.

2. Remove and replace the lower flat roof section with a 2-ply modified bitumen roof assembly.

3. Removal of obsolete/covered/abandoned rooftop curbs, supports and penetrations. Work entails the installation of steel plate or steel deck, properly-installed over openings created through the removal of obsolete items.

4. Removal and replacement of all layers of existing perimeter sheet-metal flashings and replacement of existing rotted perimeter wood blocking components on the lower flat roof.

5. Removal and replacement of two (2) internal drains on the upper roof and all existing scuppers and downspouts.

6. Installation of additional layers of new, pressure-treated wood blocking to match the maximum height of new thermal-insulation components.

7. Removal and replacement of existing sheet-metal projection flashings (sleeves/umbrellas).

8. Installation of new pressure-treated wood sleepers (embedded and above-roof) and protective pads to properly-support rooftop equipment.

9. Shop-fabrication and installation of new sheet-metal flashings at roof perimeters, curbs and related details, as required to provide a watertight assembly.

10. Execution of various, miscellaneous flashing details, terminations, rough-carpentry and related-items to deliver the roofing assembly into a long-term, leak-free and aesthetically-pleasing condition.

11. Installation of Fibergrate walkway panels as indicated on the plan set and/or as directed by the owner.

12. Installation of non-penetrating contractor safety rails around the existing skylight.

13. Procurement and delivery of a twenty (20) year manufacturer’s warranty and companion inspection/maintenance program, as stipulated in the project documents.

C. As outlined, the Contractor shall supply all material, labor, equipment, insurance, temporary protection, tools and expertise necessary for the proper and legal completion of the work as described in the Plans and Specifications, in accordance with the Contract Documents, good construction practice, all applicable codes and laws, and as required by the materials manufacturers.

D. Supply all protection necessary to protect workers, building occupants and adjacent personnel.

E. All means and methods are the responsibility of the Contractor.

F. The Contractor is solely responsible for safety on the job site.

1.03 UNIT PRICES

A. The Unit Prices are described on the Bid Form.

1.04 BID ALTERNATES

A. The Bid Alternates are described on the Bid Form.

1.05 TIME OF COMPLETION

A. The work shall commence upon issuance of contract as be completed by December 31, 2022.

1.06 LIQUIDATED DAMAGES

A. Not applicable.

1.07 INTENT OF THE PROJECT MANUAL

A. Whenever “furnish,” “install,” or “provide” is used in the Contract Documents, it shall mean to erect, install, connect, make operative, and supply all labor and materials, including miscellaneous fittings, hardware, blocking, and accessories necessary to complete the installation of the specified item.

B. The scope of work is indicated in the Project Manual. Areas of required work indicated on the drawings are for illustration and are not to be interpreted as representing quantities, exact locations, and/or the extent of work required. The Owner makes no representation of the exact quantities of work required. It shall be the responsibility of the Contractor to do all work to the complete fulfillment of the requirements of the Project Manual.

1.08 ERRORS, OMISSIONS, AND CONFLICTS IN THE PROJECT MANUAL

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

1.09 UNFORESEEN FIELD CONDITIONS

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

END OF SECTION

SECTION 010400 EXISTING CONDITIONS

1.01 GENERAL REQUIREMENTS

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings that the furnished construction be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 EXISTING CONDITIONS

A. Before submitting a Bid, the Contractor shall make a thorough examination of the conditions at the site, checking the requirements of the Plans and the Specifications with the existing conditions.

B. No claim for extra compensation or extension of time will be allowed on account of the Contractor’s failure to estimate properly the quantities, locations, and measurements of all items required to complete the work which could be discerned from visiting the site.

C. The Contractor shall report any discrepancies to the Owner and request an interpretation.

D. It shall be the Contractor’s responsibility to verify actual conditions and to make determinations as to the best possible method for performing the work indicated on the Drawings and Specifications.

END OF SECTION

SECTION 010410 OWNER COORDINATION

1.01 GENERAL REQUIREMENTS

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings that the furnished construction is complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 COORDINATION

A. Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

B. Where installation of one component depends on installation of other components before or after its own installation, schedule activities in the sequence required to obtain the best results.

C. Where space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.

D. Make provisions to accommodate items scheduled for later installation.

1.04 ADMINISTRATIVE PROCEDURES

A. Coordinate scheduling and timing of administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project closeout activities.

1.05 COMMUNICATIONS

A. The Contractor shall provide the Owner's designated representative with cellular phone numbers for all key Contractor staff. These phone numbers shall be in full-service, available for the Owner's use during normal work-hours and during off-hours, weekends.

1.06 INSPECTION OF CONDITIONS

A. The Contractor shall inspect all substrates and conditions under which Work is performed. Do not proceed until unsatisfactory conditions have been corrected. The Contractor shall field-verify all measurements and existing conditions/ constructions at each site; shall be responsible for their accuracy and shall perform the Work in conformity with same. No extra charge or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on any supplied Drawings.

1.07 MANUFACTURER'S INSTRUCTIONS

A. Comply with manufacturer's installation instructions and recommendations to the extent that they are more stringent than requirements in Contract Documents.

1.08 INSPECT

A. Inspect material immediately upon delivery and again prior to installation. Reject damaged and /or defective items.

1.09 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply temporary, protective coverings where required to ensure protection from damage or deterioration at Substantial Completion.

END OF SECTION

SECTION 010500 CONDUCT OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

1.02 Contractor's use of premises

A. The Contractor shall be granted limited-access to spaces, adjacent to the building, during the construction process. The Contractor shall coordinate and restrict their activities so as not to interfere with the Owner's operations.

B. Keep driveways, truck aprons and entrances clear at all times. Do not use unauthorized areas for parking or storage of materials. Schedule deliveries to minimize requirements for storage of materials.

1.03 PROJECT MANAGEMENT

A. Building spaces will be fully-occupied during construction by Owner personnel and/or outside Contractors. The Contractor shall take all necessary precautions to ensure the safety of any site-personnel throughout construction.

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

C. Damage to Person and Property

1. The buildings and premises are presently occupied with Owner operations, and will remain-so, throughout construction. All work shall be executed with as little inconvenience as reasonably possible and without danger to site personnel and/or permanent structures, within the project area. Any damage to buildings, roads, bituminous concrete areas, fences, lawn areas, trees, shrubbery, electric or telephone poles, underground utilities, etc., shall be repaired by the Contractor at his own expense. Damaged property shall be returned to its original condition prior to the damages within a reasonable time period, except all utility outages shall be repaired immediately.

D. Shutdown of Services

1. The Contractor's attention is especially called to the fact that continuous operation of services at this site is mandatory. During the period of construction of the new work and/or alterations to the existing work, the progress and sequence of installation shall be carefully planned and

approved by the Owner. If it is expected that the facility will be left without water, electricity, gas, sanitary facilities, or any other services, the Contractor shall provide immediate written notice to the Owner and not proceed until written authorization has been received from the Owner.

E. Protection of Persons and Property

1. The Contractor shall be aware that special consideration must be made to the fact that they are working in a complex, busy and fully-functioning facility. Tools, construction equipment, and construction materials are not to hinder the Owner's operations at any time, without prior permission from the Owner. Open areas left during the course of construction must be covered or otherwise made safe. Any considerations made for the safety of the building occupants shall be made to the Owner's approval.

2. The Contractor shall, at all times, leave an unobstructed way along the roadways and walks, and shall maintain barriers and lights for the protection of all persons and property in all locations where materials are stored, or where work is in-progress.

F. Care of Work

1. All work is to be carefully-protected so that no damage will come to it from water, accident, or any other cause, which may come to any of the work, shall be repaired immediately by the Contractor at his own expense and without additional cost to the Owner. This shall also apply to any abutting or adjoining work on the premises. The Contractor shall be responsible for any damage, and in the event of such damage, the Contractor shall repair the damage immediately at his own cost and without additional cost to the Owner.

G. Removal of Debris

1. Debris of any nature shall be completely-removed from the work-area at the end of each day and delivered into containers provided/supplied by the Contractor. The area of work must be left clean at the end of each work day to a standard acceptable to the Owner. Noise and pollution must be kept to a minimum.

H. Security

1. The Contractor is responsible for the security of all work until the Owner accepts the work.

I. Extermination

1. The Contractor is responsible for any extermination that may be required during the course of construction to

a. Allow construction workers to work in safe, sanitary conditions, or

b. Combat migration of pests disturbed by construction operations.

J. Egress

1. Required egress is to be maintained at all times.

K. Unless specifically authorized by the Owner, in writing, the work must be conducted between the hours of 7:00 AM and 5:30 PM on Monday through Friday. Work may be done on Saturdays, or Sundays after authorization by the Owner.

L. There shall be no storage of materials, tools, and/or equipment within any of the Owner's facilities. Any storage within the Owner's facilities must be authorized by the Owner, in-advance, in writing.

M. Only materials and/or equipment intended and necessary for immediate use shall be brought into the site. At the end of each work day and at the completion of each phase of work, equipment and leftover or unused materials shall be removed from the site.

N. Workers are not permitted to smoke on the Owner's property. Failure on the part of the Contractor to police/control their staff will result in a full-time, fire-department member being assigned to perform fire-control services. All such costs/expenses shall be absorbed by the Contractor.

1.04 COORDINATION

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

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

C. The Contractor shall supply to the Owner the name, cellular telephone number of the responsible person (both the Project Manager and the Site Supervisor) who may be contacted during off-hour emergencies on the project. The Contractor's Project Manager and/or Site Supervisor must be able to be contacted immediately during the hours of work and during non-work-hours for emergencies on the project via cellular telephone.

D. The Contractor shall cooperate at all times with the Owner, and ensure the cooperation of his key personnel and that of his Subcontractors.

1.05 OWNER'S COOPERATION

A. The Owner shall assist the Contractor to perform the Work in accordance with the approved operational plan by removing obstructions that may be in the Contractors way, upon proper notice from the Contractor.

B. The Owner may provide a Coordinator to act as liaison with building-occupants and to assist the Contractor in fulfilling project-related notifications.

END OF SECTION

SECTION 013000 SUBMITTALS: SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1.01 GENERAL REQUIREMENTS

A. This Section specifies requirements for handling submittals, samples, etc.

B. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.

C. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

F. It is the intent of the Specifications and the Drawings that the furnished construction be complete in every respect, and that this Contractor shall provide all equipment needed and usually-furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 GENERAL PROCEDURES FOR SUBMITTALS

A. Timeliness: The Contractor shall transmit each submittal to the Owner sufficiently in advance of performing related Work or other applicable activities so that the installation is not delayed by processing times, including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Owner in advance of the Work.

B. Sequence: The Contractor shall transmit each submittal in a sequence which will not result in the Owner's approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.

C. Contractor's Review and Approval: Only submittals received from and bearing the stamp of approval of the Contractor will be considered for review by the Owner. Submittals shall be accompanied by a transmittal notice stating name of Project, date of submittal, "To," "From" (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section, or Drawing No. to which the

submittal refers, purpose (first submittal, resubmittal), description, remarks, distribution record, and signature of transmitter.

D. Owner's Action: The Owner will review the Contractor's submittals and return them with one of the following actions recorded thereon by appropriate markings:

1. Final Unrestricted Release: Where marked "Approved" the Work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents.

2. Final-But-Restricted Release: When marked "Approved as Noted" the Work may proceed provided it complies with the Owner's notations or corrections on the submittal and complies with the requirements of the Contract Documents. Acceptance of the Work will depend on these compliances.

3. Returned for Re-submittal: When marked "Revise and Resubmit" or "Disapproved" the Work covered by the submittal (such as purchasing, fabrication, delivery, or other activity) should not proceed. The submittal should be revised or a new submittal resubmitted without delay, in accordance with the Owner's notations stating the reasons for returning the submittal.

E. Processing: All costs for printing, preparing, packaging, submitting, resubmitting, and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.

1.03 SUBMISSION OF SHOP DRAWINGS

A. Shop Drawings shall be complete, giving all information necessary or requested in the individual section of the specifications. They shall also show adjoining Work and details of connection thereto.

B. Shop Drawings shall be for whole systems. Partial submissions will not be accepted.

C. The Owner reserves the right to review and approve shop drawings only after approval of related product data and samples.

D. Shop drawings shall be properly identified and contain the name of the project, name of the firm submitting the shop drawings, shop drawing number, date of shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Owner's stamp.

E. The Contractor shall submit to the Owner two (2) black line prints of each shop drawing and one (1) digital copy. Prints shall be mailed or delivered in roll form. Each submittal shall be accompanied by a transmittal notice.

F. When the transparency is returned by the Owner with the stamp "Revise and Resubmit" or "Disapproved", the Contractor shall correct the original drawing or prepare a new drawing and resubmit a transparency and two prints thereof to the Owner for approval. This procedure shall be repeated until the Owner's approval is obtained.

G. When the transparency is returned by the Owner with the stamp "Approved" or "Approved as Corrected", the Contractor shall provide and distribute the prints for all Contractor and Subcontractors use, and in addition submit, within 10 calendar days after approval, 4 prints to the Owner.

H. The Contractor shall maintain one full set of approved shop drawings at the site.

1.04 SUBMISSION OF PRODUCT DATA

A. The Contractor shall submit one (1) digital copy and two (2) hard copies of Product Data to the Owner. All such data shall be specific and identification of material or equipment submitted shall be clearly marked in ink. Data of general nature will not be accepted.

B. Product Data shall be accompanied by a transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location, which will not impair legibility.

C. Product Data returned by the Owner as "Disapproved" shall be resubmitted in 2 copies until the Owners approval is obtained.

D. When the Product Data are acceptable, the Owner will stamp them "Approved" or "Approved as Corrected", retain 1 copy, and return 1 copy to the Contractor. The Contractor shall generate, provide and distribute additional copies as may be required to complete the Work.

E. The Contractor shall maintain one full set of approved, original, Product Data at the site.

1.05 SUBMISSION OF SAMPLES

A. Unless otherwise specified in the individual section, the Contractor shall submit two specimens of each sample.

B. Samples shall be of adequate size to permit proper evaluation of materials. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of approved samples will not be approved on the Work.

C. Samples of items of interior finishes shall be submitted all at once to permit a coordinated selection of colors and finishes.

D. Samples, which can be conveniently mailed, shall be sent directly to the Owner accompanied by a transmittal notice. All transmittals shall be stamped with the Contractor's approval stamp of the material submitted.

E. All other samples shall be delivered at the field office of the Project Representative with sample identification tag, attached and properly filled in. Transmittal notice of samples so delivered with the Contractor's stamp of approval shall be mailed to the Owner.

F. If a sample is rejected by the Owner, a new sample shall be resubmitted in the manner specified hereinabove. This procedure shall be repeated until the sample is approved by the Owner.

G. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of samples whether or not particular mention is made in the specifications, at no additional cost to the Owner.

END OF SECTION

SECTION 015000 TEMPORARY FACILITIES

1.01 GENERAL REQUIREMENTS

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

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

C. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

G. It is the intent of the Specifications and the Drawings that the furnished construction be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 FIELD OFFICES

A. Not applicable.

1.03 TEMPORARY TOILETS

A. The Contractor shall provide and service an adequate number of toilet booths with chemical type toilets. Owner’s sanitary facilities are not available for use by the Contractor.

B. The toilets shall be erected in a location approved by the Owner and shall be maintained by the Contractor in a clean and orderly condition in compliance with all local and state health requirements.

1.04 TEMPORARY CONSTRUCTION FENCE

A. The Contractor shall be responsible for providing and maintaining temporary fencing or barricades around any ground-based staging-areas, hoisting-equipment, materials and/or similar activities, as may be necessary to assure the safety of all persons authorized or unauthorized. Such protective measures shall be located and constructed as required by local, state, Owner and federal mandates, laws, codes, and/or regulations.

1.05 TEMPORARY STRUCTURES AND MATERIAL HANDLING

A. The Contractor shall provide heated storage containers, temporary buildings, or trailers as required for the performance of the Contract.

B. Materials shall be handled, stored, warmed, installed, cleaned, and protected in accordance with the best practice in the industry and, except where otherwise specified in the Contract Documents, in accordance with manufacturer's specifications and directions.

1.06 TEMPORARY STAGING, STAIRS, CHUTES

A. Debris shall not be allowed to fall freely from the building. Materials shall not be dropped from roof surfaces. Chutes will not be permitted. Stock and remove all debris by crane-mounted scale-pans.

B. Access to the project roof areas shall be from the Contractor provided ladders or stair tower staging adjacent to the project Site. Coordinate access with the Owner or Owners Representative. Except as may be specifically-outlined, no personnel are allowed to enter any portion of the building-interior, without an escort from the Owner's designated representative.

1.07 HOISTING FACILITIES

A. Except as may be otherwise specified, the Contractor shall provide, operate, and utilize hydraulic crane equipment to hoist materials/supplies to/from the roof surface.

1.08 TEMPORARY WATER

A. The Contractor may make use of the available water supply at the site for construction purposes, provided the permission of the Owner is obtained beforehand and only as long as the water is not used wastefully.

B. The Contractor shall provide all necessary piping and hoses to utilize the available sources of water.

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

1.09 TEMPORARY ELECTRICITY

A. The Contractor may make use of the electricity available at the site, metered and paid for by the Owner, provided that the Contractor shall supply proper adapters and extension cords.

1. Where heavy-duty electric equipment drawing current in excess of 15 amperes is involved, the Contractor shall provide temporary service to supply the power.

2. The temporary electric service shall include, but not be limited to labor, materials, and equipment necessary to supply temporary power of adequate capacity for the project.

3. Transformers and meters, when required by the power company, will be furnished by the power company and the contractor shall pay the costs therefore.

B. Temporary electrical Work shall be performed under the direct supervision of at least one master electrician, who will be present on the project at all times when such work is being performed.

C. All temporary work shall be provided in conformity with the National Electric Code, State laws, and requirements of the power company.

1.10 WEATHER PROTECTION

A. "Weather Protection" means the temporary protection of that Work adversely affected by moisture, wind, and cold by covering, enclosing, and/or heating.

B. The Contractor shall assume the entire responsibility for weather protection during, construction (until Substantial Completion), and shall be liable for any damage to any Work caused by failure to supply proper weather protection to installed or stored-components.

C. It is to be specifically understood that the Contractor shall do no work under any conditions deemed unsuitable by the Contractor or the full-time, jobsite inspector. This provision shall not constitute any waiver, release, or lessening of the Contractor's obligation to bring the Work to Substantial Completion within the period of time set forth in the Contract Documents.

END OF SECTION

SECTION 015100 PROTECTION

1.01 PROTECTION OF PERSONS AND PROPERTIES

A. All Owner facilities will be occupied during construction. The Contractor shall take all necessary precautions to ensure the safety and convenience of any/all personnel in, or near, the project site.

B. Any damage to buildings, roads, concrete and bituminous areas, fences, lawn areas, trees, shrubbery, poles, underground utilities, etc. shall be made good by and at the Contractor's own expense, all to the satisfaction of the Owner.

C. The Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged after the installation of new work at no expense to the Owner. All repair and replacement work shall match the existing in kind and appearance.

1.02 TEMPORARY PROTECTION

A. The Contractor shall:

1. Protect buildings and materials at all times from exposure to water, dust, debris and/or other construction related nuisances. Provide all necessary equipment, expertise and planning to keep newly-installed materials watertight throughout construction.

2. Provide temporary watertight enclosures for openings in roof decks when and as required to protect the Work from damage by inclement weather.

B. Completed roof surfaces shall not be subjected to traffic nor shall they be used for storage of materials. Where some activity must take place in order to carry out the Work, adequate protection must be provided.

C. After the installation of the Work is completed, the Contractor shall be responsible for its protection and for repairing, replacing, or cleaning any such Work which has been damaged by other trades or by any other cause, so that all Work is in first class condition at the time of Substantial Completion.

1.03 ACCESS

A. The Contractor shall, at all times, leave an unobstructed way along walks and roadways, and shall maintain proper barriers (not Snow Fences) and lights for the protection of all persons and property in all locations where materials are stored or work is in progress.

1.04 SECURITY

A. The Contractor shall be responsible for providing all security and safety precautions necessary to protect the Contractor's and Owner's interests.

1.05 NOISE AND DUST CONTROL

A. The Contractor shall take special measures to protect the building-occupants, neighbors, and all site-personnel from noise, dust and other disturbances by:

1. Keeping common pedestrian and vehicular circulation areas clean and unobstructed;

2. Insulate work areas from occupied portions as far as possible; and

3. Sealing dust and fumes from contaminating occupied spaces.

1.06 FIRE PROTECTION

A. The Contractor shall take necessary precautions to insure against fire during construction. The Contractor shall be responsible to insure that the area within contract limits is kept orderly and clean and that combustible rubbish and construction debris is promptly removed from the site.

B. Installation of equipment suitable for fire protection shall be done as soon as possible after commencement of the Work.

1.07 WIND PROTECTION

A. Should high-wind warnings be issued by the U.S. Weather Bureau, the Contractor shall take every precaution to minimize danger to persons, to the Work, and to the adjacent property.

END OF SECTION

SECTION 015200 CLEANING UP

1.01 GENERAL REQUIREMENTS

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings that the furnished construction be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 CLEANING DURING CONSTRUCTION

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

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

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

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

C. Do not allow materials and rubbish to drop free or be thrown from roof surfaces.

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

1.03 FINAL CLEANING

A. Prior to submitting a request to the Owner to certify Substantial Completion of the Work, the Contractor shall inspect all interior and exterior spaces (with the Owner) and verify that all waste materials, rubbish, tools, equipment, machinery, and surplus materials have been removed, and that all sight-exposed surfaces are clean.

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

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

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

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

F. Remove mastic, adhesive, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed exterior surfaces.

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

H. Broom-clean all exposed, paved surfaces. Rake clean other surfaces of grounds.

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

END OF SECTION

SECTION 017000 PROJECT CLOSEOUT

1.01 GENERAL REQUIREMENTS

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings that the furnished construction is complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SUBSTANTIAL COMPLETION

A. Prior to requesting Substantial Completion the Contractor shall make a thorough inspection of the Work. During this inspection the Contractor shall prepare a comprehensive list of all items remaining to be completed or corrected. This list shall include all remaining Contractor and Subcontractor items to be provided under the Contract Documents.

B. Upon completion of the items noted on the Contractor’s list the Contractor shall notify the Owner that the Work is Substantially Complete. The Owner shall then conduct a similar thorough inspection. If the Owner agrees that the Work is Substantially Complete, the Owner will promptly make a thorough inspection and prepare a punch list setting forth in accurate detail any items on the Contractor’s list and additional items that are not acceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.

C. The Contractor shall not be relieved of the responsibility to provide Contract items left off of the Owner’s punch list.

D. If the Owner determines that the Work is not Substantially Complete, the Owner shall inform the Contractor of those items that must be completed before the Owner will prepare a punch list. Upon completion of those items, the Contractor shall again request the Owner to prepare a punch list.

E. When the punch list has been prepared, the Owner will arrange a meeting, with the Contractor and Subcontractors to identify and explain all punch list items and answer questions on work, which must be done before final acceptance.

F. The Owner may revise the punch list from time to time, to ensure that all items of Work are properly completed.

1.03 RECORD DRAWINGS

A. Consult the individual sections of the Specifications for the specific requirements of those sections. In cases of inconsistency the more stringent requirement, as directed by the Owner, shall be required.

B. Prior to final payment and completion the Contractor shall provide all marked up As Built Drawings as required under other sections of the Specifications.

C. Copies of all Building and other construction-related Permits shall also be provided.

1.04 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Consult the individual sections of the specifications for the specific requirements for those sections and for further details and descriptions of the requirements

B. Prior to final payment and completion the Contractor shall provide all Maintenance Instructions for newly-installed construction components.

END OF SECTION

SECTION 017200 SURVEYS AND RECORD DRAWINGS

1.01 GENERAL REQUIREMENTS

A. As may exist, include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings that the furnished construction be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 SURVEYS

A. Upon completion of the Work, the Contractor shall provide the following As-Built drawings to the Owner, viz. one (1) set of paper copies and an electronic (PDF) version. The drawings shall be the same size as the Contract Document drawings in the Contract Documents.

1.03 RECORD DRAWINGS

A. Record Drawings shall consist of all the Contract Drawings.

B. From the sets of drawings furnished by the Owner, the Contractor shall reserve one set for record purposes.

C. All changes, including those issued by Addendum, Change Order, or instructions by the Owner shall be recorded. As Built drawings shall be prepared for all Work of the entire project.

D. At Substantial Completion the Contractor shall submit the complete set of marked up As Built drawings to the Owner. The Contractor shall check all marked up As-Builts prepared by subcontractors and certify in writing on the title sheet of the drawings that they are complete and correct, prior to submission to the Owner.

E. The Owner shall review the marked up As-Built drawings and verify by letter to the Contractor that the Work is complete.

F. The Contractor shall incorporate all changes onto original drawings.

G. Submission of accurate marked up As-Built drawings and their approval by the Owner shall be a condition precedent to final payment.

END OF SECTION

DIVISION 2 – 15: TECHNICAL SPECIFICATIONS
SECTION 020500 SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The work of this section consists of the selective demolition and legal disposal of all existing materials identified for removal.

B. Demolition work shall include but is not entirely limited to the following:

1. Removal and legal disposal of selective portions of existing asphalt roof shingles, and related underlayment, and gutter systems as indicated and related materials for the installation of new ice & water shielding underlayment and related siding, roofing and gutter and downspout systems as indicated in the contract documents.

2. Removal and legal disposal of selective portions of any damaged roof sheathing or wood blocking encountered during demolition, and replacement to match existing materials shall be by Unit Cost as noted in the Bid Form.

C. The Roofing Contractor is required to supply, erect and maintain extension-ladder and/or stair tower access to provide a safe means-of-access to the roof surfaces for their workforce. Extension-ladders or stair towers to various roof levels are to be removed or secured at the end of each working-day to help prevent unauthorized access. All extension ladders and stair towers shall be fully OSHA-compliant and maintained in proper working-order at all times.

D. The Contractor is made aware that the existing buildings will be fully occupied for the duration of construction. The Contractor is responsible for taking all necessary steps to keep the existing roofing systems in a watertight condition throughout the duration of the project. The Contractor shall exercise extreme caution during demolition activities so that internal spaces and the public are protected from damage and/or injury.

E. The Contractor shall have sole responsibility for accuracy of all measurements, estimates of material quantities, existing roof composition, sizes and other site conditions that will affect the work. Any existing roof composition information supplied to Bidders prior-to their bid-submission is provided as a courtesy, and is not guaranteed to be accurate.

F. The drawings indicate and show limits of construction for this project. The specifications specify material and work requirements for this

project. Both are complementary to each other and both shall be followed to complete the work.

1.02 RELATED WORK

A. All of the Project Documents, including any General and/or Supplementary Conditions and Project Manual Forms apply to the work of this Section.

B. Carefully examine all of the Project Documents for requirements which affect the Work of this Section. The exact scope of work of this Section cannot be fully-determined without a thorough review of all specification sections and other Project Documents.

Related Sections:

Section 061000 - Rough & Finish Carpentry

Section 070150 – Rehabilitation of Single Ply Roofing

Section 073110 - Asphalt Shingles

Section 074113 – Metal Standing Seam Roof Panels, Ventilated

Section 077100 – Gutters, Downspouts and Snow Guards

1.03 COORDINATION

A. The Roofing Contractor is designated as the General Contractor for this project. It is the responsibility of the Roofing Contractor to coordinate the work of this Section with all other work (including any Owner-provided sub-contractors).

B. Coordinate daily scheduled work with the Owner's designated representative each day prior to beginning work on site. Provide a weekly schedule of proposed schedule of work for review with the Owner's designated representative prior to the start of work each week.

1.04 JOB CONDITIONS

A. Work hours for the project will be between the hours of 7:00 a.m. and 5:30 p.m. Monday through Friday, Work may be done on Saturdays, or Sundays after authorization by the Owner..

B. The Contractor shall carefully-inspect the premises prior to the submittal of his proposal for conditions which may affect his work.

C. Demolition, storage of materials, removal of debris and construction operations shall be conducted to minimize interference with the Owner's operations. All demolition will be completed in-accordance with pre-defined schedules/windows, as provided by the Owner.

D. Owner shall provide power for lighting, small tools and similar items at no cost to the Contractor, but Contractor must employ a licensed electrician (satisfactory to the Owner) to make any required connections related to any temporary wiring. No electrical equipment larger than 1500 Watts shall be allowed to be connected to the Owner's lines unless Owner is reimbursed for utility company charges.

E. All hoisting, demolition and hauling equipment required for the proper completion of the work shall be furnished, installed, operated and maintained in safe condition by the Contractor. All crane costs associated with the delivery and/or disposal of materials to/from the roof surfaces is the responsibility of the Roofing Contractor.

F. The Contractor shall remove all debris from the project site and deliver all such debris into dumpster/dump-trailers supplied by the Contractor. The Contractor is responsible for handling/transporting/facilitating the legal disposal of all debris generated through the course of the project. The safe and controlled delivery of debris into dumpsters/dump-trailers shall be the complete-responsibility of the Contractor.

G. No mechanized demolition equipment shall be permitted on the various roof decks. All demolition equipment shall be approved by the Owner prior to the start of construction.

H. The Contractor bares sole responsibility for the protection of the interior and exterior portions of the structure (and its contents) from inclement weather throughout the completion of the project.

I. The Contractor is required to supply/provide the Owner with an accurate roof-plan drawing indicating the Contractor's planned-progress through each portion of the project. Incidental-debris (dust, minor-quantities-of-dirt, etc.) will be cleaned-up by the Owner.

J. The Contractor is fully-responsible for protecting all interior portions of the building during roof deck replacement, roof deck infill operations and/or the removal/replacement of roof drain assemblies. Carefully-protect interior building components throughout all phases of such work. All job-related debris shall be cleaned-up (immediately), to the satisfaction of the Owner.

K. It will be the responsibility of the Contractor to ensure that each Unit remains weather tight for the duration of the scope of work. Any cost for repairs for

damage caused by the failure of the ability to keep the Unit weather tight during construction operations will be paid for by the Contractor.

1.05 PERMITS

A. The Roofing Contractor, shall obtain all necessary authorizations, including Building Permits, licenses and other requirements necessary for the legal execution of the work. All costs associated with the purchase of the Building Permit shall be the financial responsibility of the Roofing Contractor.

B. The Roofing Contractor shall bear responsibility to provide all necessary notices and comply with all regulations of all authorities having jurisdiction, including State, County, and Town Building and Sanitary Laws, Rules, Ordinances, or Regulations, relating to the designated roof replacement Scope. The Roofing Contractor shall pay all inspection fees and costs imposed by the above.

C. The Contractor shall provide the Owner with evidence of the payment of any and all necessary permits, licenses, and other requirements (as outlined in the preceding paragraph). All such evidence shall be submitted with each Application for Payment.

1.06 SEQUENCE OF OPERATIONS

A. The Contractor shall submit for approval the complete sequence of operations for demolition and show how it is coordinated with all other aspects of the job. Work shall not begin until such a schedule has been approved by the Owner.

B. The Contractor shall include with his sequence schedule a description of all procedures and equipment to be utilized to perform the demolition work.

1.07 ASBESTOS

A. The flat roof areas have not been tested for the presence of asbestos or asbestos containing material. It is the Roofing Contractor's responsibility to observe demolition and notify the Tremco Representative of the possible presence of any ACM material. If additional ACM is present, it is the contractor's responsibility to properly handle and dispose of the ACM in accordance with Local, State and Federal regulations.

B. The Roofing Contractor is responsible for completing all roof removal/disposal activities, including asbestos-containing materials removal, in complete/full-compliance with all applicable rules and regulations. The Contractor will engage the appropriate technical resources and/or outside entities to assess and

handle/manage the removal/disposal of any hazardous material. The responsibility to secure notifications, procure permits, obtain licenses and other related, regulatory requirements shall be the sole responsibility of the Contractor.

C. If the Contractor (or a Subcontractor) disturbs, removes disposes, or encapsulates any hazardous material in a manner not in accordance with all required regulations/procedures, the Contractor shall indemnify, defend, and hold harmless the Owner, against any loss, damage, or liability arising, or resulting from, such unauthorized improper acts of the Contractor and/or Subcontractor; and further, the Owner, and any designated Consultants, Specifiers, Engineers and/or Project Managers shall be indemnified from for any such loss, damage or liability arising, or resulting from the Contractor's and/or Subcontractor's acts.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Notify the Owner, a minimum of forty-eight (48) hours in-advance, of the need to provide dumpsters/dump-trailers for the disposal of job-related demolition materials. Advance coordination with the Owner is the Roofing Contractor’s responsibility. Remove all dumpster/dump-trailers when full.

PART 3 - EXECUTION

3.01 PROTECTION

A. Before starting demolition, the Contractor shall be solely-responsible for making all necessary arrangements and for performing any necessary measures required to ensure the complete-safety of all building-occupants, the public, onsite personnel, associated trades-people and the Contractor’s workforce.

B. Adequate protection of persons and property shall be provided at all times. The work shall be executed in a manner to avoid interference with the use of adjacent buildings, areas or properties, and to avoid interruption of free passage to or from such buildings, areas or properties, except as agreed-to in-advance with the Owner.

C. Investigate and comply with any/all rules, regulations, guidelines and other safety provisions required by the Owner. All personnel are to fully-comply with any Owner-mandated and/or OSHA-mandated, personal-protection guidelines through the course of the Work.

D. Furnish signs, lights, protective-staging, barricades and other equipment as may be necessary for the safe execution of the work.

E. If necessary for the safe execution of the work, provide ground-based personnel to direct pedestrian and vehicle traffic away from areas presenting a particular hazard.

3.02 POLLUTION CONTROL

A. The Contractor shall be aware that portions of these facilities will be in active use and open to the public throughout the course of construction and that any disruption or inconvenience sustained by the Owner (or others) must be kept to a reasonable minimum. The Contractor shall select equipment and procedures to mitigate noise, airborne dust and other forms of discomfort.

B. All demolished materials shall be delivered into dumpsters/dump-trailers (supplied by the Roofing Contractor) in a safe, neat and controlled fashion. No debris shall be 'thrown' or 'tossed' from the various roof surfaces. Deliver all debris into dumpsters/dump-trailers in a controlled and precise fashion.

C. The Contractor shall supply all necessary protection at building perimeters to accommodate the delivery of debris into dumpsters or dump-trailers. All tarps, staging and other means of protection are the sole responsibility of the Contractor.

D. The Contractor shall, at all times, keep debris from migrating to adjacent portions of the property. All debris shall be properly-secured from high winds (at all times) to limit the spread of debris onto adjacent property, vehicles, streets, parking-areas and/or other restricted areas. If the control of debris cannot be properly-handled, the Owner reserves the right to stop the work (without compensation to the Contractor) until the Contractor is able to properly-control the existing conditions.

3.03 ON-SITE STORAGE & STAGING-AREAS

A. The Owner is able to provide limited quantities of ground-level areas for the storage of materials and project-staging areas. All ground-based access and staging-areas are to be organized and arranged-for by the Roofing Contractor, through the Town, with prior-approval and coordination with the Owner.

B. The Owner reserves the right to limit/restrict various staging/storage areas, if it's believed to represent a hardship or substantial inconvenience to the Owner's operations.

C. A central dumpster location will be designated by the Owner for use for the duration of the project. It will be expected that all demolition and construction debris will be cleaned up daily and brought to the central dumpster location.

3.04 REPAIR OF DAMAGES

A. The Roofing Contractor shall be responsible for conducting a careful inspection of the building exterior prior to the commencement of the work. All damaged, stained or deteriorated elements of the building shall be documented and submitted to the Owner prior to the start of the work. Any damaged or deteriorated elements of the building (or adjacent sidewalks and/or staging/storage areas) identified after the completion of the work and not found to be included on the original documentation will become the responsibility of the Roofing Contractor. All repairs and/or replacement of such damage will be conducted (at no additional expense to the Owner) to the satisfaction of the Owner. Failure on the part of the Contractor to perform this pre-inspection, documentation leaves the Contractor vulnerable to the repair of damages, not-caused through the course of the project.

B. Damage to any portion of the building which results in the disruption-of, or inconvenience-to the Owner or his employees shall be immediately repaired or replaced by the Contractor. If such restitution is not promptly made, the Owner shall have the necessary work performed by an outside entity at the Contractor's expense.

3.05 CLEAN-UP

A. The building and adjacent areas (including landscaping, sidewalks and staging/storage areas) shall be left in a broom-clean condition at the end of each day. All dumpsters or dump trailers shall be covered at the end of each day to prevent the migration of debris through high-winds.

B. On completion of the work of this section and after removal of all debris, the site shall be left in a clean condition satisfactory to the Owner.

END OF SECTION

SECTION 061000 ROUGH & FINISH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The work of this Section consists of furnishing and installing all rough carpentry, finish carpentry, and related items as depicted on the drawings and/or specified herein, or such materials required to successfully-complete the required work.

B. All materials shall be verified by the Contractor to be proper for each intended use, and the entire work of this Section shall be done in such a manner that each installation will perform its intended purpose as applicable, in the finished work.

C. Provide all wood blocking, nailers and/or plywood, as specified herein and indicated on drawings, or as otherwise might be required, for the proper installation of the new roofing, siding, gutters and downspouts and related work.

D. Provide all building wrap underlayment, 1x pressure treated trim boards for fascia at new gutters, and standing and running trim as specified herein and indicated on drawings, or as otherwise might be required, for the proper installation of the new roofing, gutters and downspouts and related work.

E. Removal and legal disposal of selective portions of any damaged roof sheathing or wood blocking encountered during demolition, and replacement to match existing materials shall be by Unit Cost as noted in the Bid Form.

F. The drawings indicate and show limits of construction for this project. The specifications specify materials and work requirements for this project. Both are complementary to each other and both shall be followed to complete the work.

1.02 RELATED WORK UNDER OTHER SECTIONS

A. Carefully examine all of the Project Documents for requirements that affect the work of this Section. The exact scope of work of this Section cannot be fully determined without a thorough review of all specification sections and other Project Documents. The Project Manual/Bid Form and General Notes to the Bidding Contractors apply to the work of this section.

1. Related Sections (include but are not limited to the following):

a. Section 020500 - Selective Demolition

b. Section 070150 – Rehabilitation of Single Ply Roofing

c. Section 073110 - Asphalt Shingles

d. Section 074113 – Metal Standing Seam Roof Panels, Ventilated

e. Section 077100 – Gutters, Downspouts and Snow Guards

1.03 DELIVERY AND STORAGE

A. All materials when delivered to site shall be stacked and stored above the ground under protective coverings in such a manner as to insure proper drainage, ventilation, and protection from the weather.

B. Store all materials is areas designated as acceptable to the Owner. The contractor shall be fully responsible for all materials stored on site, and shall take appropriate measures to protect stored materials from damage and theft.

1.04 SUBMITTALS

A. Submit the following data:

1. Manufacturer's or applicator's specification for wood preservative treatment and treatment procedure to be sure that a satisfactory treatment will be obtained.

2. Manufacturer's specification data sheets for all fasteners to be used, clearly identifying such as their intended use.

3. Samples of all clapboards and standing and running trim, including back priming and finishing to exhibit match to existing.

PART 2 - PRODUCTS

2.01 DIMENSIONAL AND FINISH LUMBER

A. All blocking and framing materials shall be of sound, new, straight, and consistent sized stock, free of stains and mildew. All exposed or semi-exposed wood members shall be selected for their best possible appearance from the grade and stock specified.

B. All blocking and framing materials shall be surfaced on four (4) sides and shall bear the grade and trademark of the association under whose rules it is produced and a mark of mill identification. All materials shall be construction grade Douglas Fir, Hem-Fir, West Coat Hemlock, West Coast Fir, or Southern Yellow Pine.

C. Blocking shall be furnished in the longest practicable length with respect to each intended use - at least ten (10) feet unless shorter lengths are required. Single length pieces shall be used whenever possible.

D. All new wood blocking shall be pressure-treated with waterborne salt preservatives that will have no deteriorating effects on the proposed roofing materials. The treatment shall be 0.40 lbs. per cubic foot of retention. The treatment shall leave a noticeable tint to the wood so that the treated wood can be visually differentiated from all untreated wood. No oil-based pentachlorophenol or creosote treatments will be permitted.

2.02 PLYWOOD

A. All roof sheathing for replacement areas shall be minimum exterior grade of Group 1 or 2 species, Type CDX or better, unless otherwise noted. All plywood shall have an APA stamp on it and shall meet the requirements of Product Standard PS 1-83 for Construction and Industrial Plywood.

1. 5/8" thick for general uses at roof sheathing.

2. Refer to Unit Costs in Bid Form for related work.

2.03 FASTENERS

A. All roof sheathing for replacement areas shall be minimum 5/8” plywood sheathing w/ 8d nails at 6” o.c. at edges and 6” o.c. in field unless otherwise noted. Roof sheathing within 4’ of eaves or gable ends to be fastened with 8d nails at 4” o.c. at edges and 6” o.c. in field.

B. All fasteners must be certified to be compatible with all pressure treated materials found on the project.

C. Powder-actuated type fasteners ARE NOT to be used to fasten plywood and/or wood blocking.

PART 3 - EXECUTION

3.01 GENERAL

A. Construct all indicated rough carpentry work plumb, level, and true with tight and close-fitting joints. All carpentry work shall be executed in a first-class workmanship manner and shall be securely attached and/or braced to the surrounding construction.

B. New wood blocking shall be installed to the same thickness as the insulation to the maximum extent possible, within 1/16" plus or minus. New wood blocking shall be a minimum of four (4”) inches in width (nominal) unless detailed otherwise.

C. New 1 x (nominal) pressure treated trim board for gutter replacement areas shall be sized to match height of existing wood gutter to be removed, and shall be fastened securely to the existing structural rafters and related soffit framing prior to the installation of new gutters.

3.02 FASTENING - GENERAL

A. All wood blocking shall be fastened in compliance with the guidelines set-forth in the latest FM Global (Factory Mutual) publications.

B. The fasteners used for wood blocking at the perimeters shall be staggered and spaced twelve (12) inches on center. The staggered fastening pattern shall be increased within eight (8) feet from outside corners to six (6) inches on center. Smaller pieces of wood blocking such as at penetrations, shall have a minimum of four (4) fasteners per piece. A fastener shall be located no more than four (4) inches from the end of each piece of wood blocking.

C. Counter bore the wood blocking at all bolt heads, nuts, and washers as/if required to provide a flush surface for the installation of new roofing materials.

D. When plywood sheathing is installed as an underlayment for flashing membranes, it shall be securely fastened at the top, the middle, and the bottom with approved fasteners spaced eighteen (18) inches on center. When plywood is used in layers, each layer of plywood shall be secured equally, with the fastener spacing as specified previously herein.

END OF SECTION 061000

SECTION 070150 REHABILITATION OF SINGLE PLY ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Roof membrane coating preparation.
2. Application of reinforced fluid-applied roof membrane and flashings over existing fully adhered EPDM membrane roof.

1.2 ROOFING CONFERENCES

A. Roofing Rehabilitation Preinstallation Conference: Conduct conference at Project site to review methods and procedures related to roofing system.

1. Meet with Owner; Architect; roofing coating materials manufacturer's representative; roofing rehabilitation Installer including project manager and foreman; and installers whose work interfaces with or affects rehabilitation including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
2. Review temporary protection requirements for existing roofing system that is to remain uncoated, during and after installation.
3. Review methods and procedures related to re-coating preparation, including coating manufacturer's written instructions.
4. Review roof drainage during each stage of coating and review roof drain plugging and plug removal procedures.
5. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
6. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect coating.
7. Review HVAC shutdown and sealing of air intakes.
8. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
9. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.

10. Review governing regulations and requirements for insurance and certificates if applicable.

11. Review existing conditions that may require notification of Owner before proceeding.

1.3 MATERIALS OWNERSHIP

A. Demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

B. Roofing Coating Preparation: Existing roofing that is to remain and be prepared to accept restorative coating application.

C. Patching: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system and replacement with similar materials.

D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.

E. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product specified.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

1. Provide manufacturer's UL listing certificate for roofing system.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing rehabilitation system.

C. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.

1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.

D. Warranties: Unexecuted sample copies of special warranties.

E. Photographs or Video Recordings: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by rehabilitation operations. Submit before Work begins.

F. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, and for dust control. Indicate proposed locations and construction of barriers.

G. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.

1. Submit report within 48 hours after inspection.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

B. Warranties: Executed copies of approved warranty forms.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of three years' experience installing products similar to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:

1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Primary product manufacturer that is UL listed for roofing system identical to that specified for this Project with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

2. An independent party certified as a Registered Roof Observer by the International Institute of Building Enclosure Consultants (formerly the Roof Consultants Institute) retained by the Contractor or the Manufacturer and approved by the Manufacturer.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with rehabilitation work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

1. Store all materials prior to application at temperatures recommended by manufacturer.

2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer.

3. Do not apply roofing in snow, rain, fog, or mist.

B. Protect building to be rehabilitated, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from rehabilitation operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

E. Owner will occupy portions of building immediately below re-coating area. Conduct re-coating so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1.10 WARRANTY

A. Manufacturer's Warranty: In which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.

1. Form of Warranty: Tremco "Plain and Simple" warranty form.

2. Scope of Warranty: Work of this Section.

3. Warranty Period: 30 years from date of completion.

4. Inspections by Manufacturer: To occur every five years following completion.

B. Installer Warranty: Installer's warranty signed by Installer, as follows.

1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.

2. Scope of Warranty: Work of this Section.

3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: The roof system specified in this Section is based upon products of Tremco CPG Inc, Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.

1. a. Sika Corp. Sikalastic RoofPro 641 Low-VOC System.

2. b. Kemper Systems, Inc. Kemperol 2K-PUR System.

B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Rehabilitated roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.

1. Accelerated Weathering: Roofing system shall withstand 5000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Exterior Fire-Test Exposure: Roofing system exterior fire-test exposure performance following application of rehabilitation coating shall be not be less than that of the prerehabilitated roof performance when tested in accordance with ASTM E108, based upon manufacturer's tests of identical applications.

2.3 MATERIALS, GENERAL

A. General: Rehabilitation materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.

B. Infill Materials: Where required to replace test cores and to patch existing roofing, use infill materials matching existing membrane roofing system materials, unless otherwise indicated.

C. Temporary Roof Drainage: Design and selection of materials for temporary roof drainage are responsibilities of the Contractor.

2.4 FLUID-APPLIED ROOFING MEMBRANE COATING

A. Polyurethane Elastomeric Fluid-Applied System: Two-coat fluid-applied roofing membrane formulated for application over prepared existing roofing substrate.

1. Polyurethane Roof Coating System Base Coat: Single-part moisture-curing, for use with a compatible top coat.

a. Basis of design product: Tremco, AlphaGuard MTS Base Coat.

b. Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system.

c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 42 g/L.

d. Accelerated Weathering, 5000 hours, ASTM G154: Pass.

e. Hardness, Shore A, minimum, ASTM D2240: 85.

f. Solids, by volume, ASTM D2697, minimum: 87 percent.

g. Minimum Thickness, Base Coat on Smooth Surface: 48 mils (1.22 mm) wet.

2. Polyurethane roof coating system top coat, low odor low VOC single-part, for application over compatible base coat.

a. Basis of design product: Tremco, AlphaGuard MTS Top Coat.

b. Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system.

c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 44 g/L.

d. Solar Reflectance Index (SRI), ASTM E1980: For white, not less than 108.

e. Accelerated Weathering, 5000 hours, ASTM G154: Pass.

f. Hardness, Shore A, minimum, ASTM D2240: 85.

g. Solids, by volume, ASTM D2697: 87.

h. Minimum Thickness: 48 mils (1.22 mm) wet over cured base coat.

i. Minimum Thickness, Slip-Resistant Coat: 20 mils (0.50 mm) wet.

j. Color: White.

B. Primers:

1. Primer for Asphaltic and Single-Ply Membranes: Water-based, polymer-modified quick-dry low odor primer.

a. Basis of design product: Tremco, AlphaGuard WB Primer.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 1 g/L.

c. Solids, by weight: 70 percent.

2. Primer for Masonry Surfaces: Two-part high-solids epoxy-penetrating low-odor primer for masonry and concrete surfaces.

a. Basis of design product: Tremco, AlphaGuard C-Prime.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.

c. Solids, by weight: 100 percent.

3. Primer for Non-Porous Surfaces: Single-part, water based primer to promote adhesion of urethanes to metals, PVC and other non-porous surfaces.

a. Basis of design product: Tremco, AlphaGuard M-Prime.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 22 g/L.

c. Nonvolatile Content, minimum, ASTM D2369: 5 percent.

d. Density at 77 deg F (25 deg C): 8.3 lb/gal (1kg/L).

4. Primer for Intercoat and Substrate Adhesion: Single-part, quick-drying primer to promote adhesion of urethane products to previous urethane coats and to other approved surfaces.

a. Basis of design product: Tremco, Geogard Primer.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 100 g/L.

c. Coverage Rate, 400 sq. ft/ gal. (10 m2/ L): 4 mils (0.10 mm) wet.

C. Fluid-Applied Roofing Reinforcing Fabric:

1. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.

a. Basis of design product: Tremco, Permafab.

b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..

c. Elongation, Minimum, ASTM D1682: 60 percent.

d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..

e. Weight: 3 oz./sq. yd (102 g/sq. m).

2.5 AUXILIARY ROOFING REHABILITATION MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system and roofing coating system.

B. Seam Sealer: Waterproof seam and patching material compatible with applied coating.

1. Seam Sealer: Aromatic polyurethane sealer, single-component, high solids, moisture curing, formulated for compatibility and use with a variety of roofing and flashing substrates.

a. Basis of design product: Tremco, GEOGARD Seam Sealer.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 189 g/L.

c. Tensile Strength, ASTM D412: 270 psi (1860 kPa).

d. Tear Strength, ASTM D412: 35 pli (6.13 kNm).

e. Elongation, ASTM D412: 220 percent.

f. Color: Gray.

C. Joint Sealant: Elastomeric joint sealant compatible with applied coating, with movement capability appropriate for application.

1. Joint Sealant, Polyurethane: ASTM C920, Type S, Grade NS, Class 50 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints; paintable.

a. Basis of design product: Tremco, TremSEAL Pro.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 40 g/L.

c. Hardness, Shore A, ASTM C661: 40.

d. Adhesion to Concrete, ASTM C794: 35 pli.

e. Tensile Strength, ASTM D412: 350 psi (2410 kPa).

f. Color: Closest match to substrate.

D. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.6 WALKWAYS

A. Slip Resistant Product for Fluid-Applied Walkways:

1. Aggregate, Slip Resistant Silica Sand: Silica sand, broadcast into fluid-applied roof coating products for use as aggregate fill for slip-resistant, abrasion-resistant coating applications.

a. Basis of design product: Aggregate, Slip Resistant Silica Sand.

b. Size: 20 - 40 mesh.

c. Application Rate: Minimum 20 - 30 lb/100 sq ft (1 - 1.5 k/m2).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine existing roofing substrates, with Installer present, for compliance with requirements and for other conditions affecting application and performance of roof coatings

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.

2. Verify compatibility with and suitability of substrates.

3. Verify that substrates are visibly dry and free of moisture.

4. Verify that roofing membrane surfaces have adequately aged to enable proper bond with base coat.

5. Verify that roofing membrane is free of blisters, splits, open laps, indications of shrinkage, and puncture damage or other indications of impending roof system failure.

6. Commencing application of coatings indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Protect existing roofing system that is indicated not to be rehabilitated, and adjacent portions of building and building equipment.

1. Mask surfaces to be protected. Seal joints subject to infiltration by coating materials.

2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.

3. Maintain temporary protection and leave in place until replacement roofing has been completed.

B. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with coating work that could affect indoor air quality or activate smoke detectors in the ductwork.

1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.

C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

3.3 ROOFING COATING PREPARATION

A. Roofing Partial Tear-off and Patching: Refer to requirements of Division 07 Section "Preparation for Re-roofing."

B. Removal of Wet Insulation: Remove portions of roofing membrane with underlying wet insulation. Remove wet insulation, fill in tear-off areas to match existing insulation and membrane, and prepare patched membrane for application of roof coating as specified below.

C. Repair of Ponding Areas: Repair areas indicated as ponding areas or areas of inadequate drainage by removing roof membrane, adding additional insulation as required to provide minimum slopes to drain required by roofing rehabilitation coating manufacturer, and replace membrane with material matching existing. Submit photographic report indicating compliance.

D. Membrane Surface Preparation:

1. Remove walkway pads and pavers from roofing membrane. Discard damaged pavers.

2. Remove blisters, ridges, buckles, roofing membrane fastener buttons projecting above the membrane, and other substrate irregularities from existing roofing membrane that would inhibit application of uniform, waterproof coating.

3. Broom clean existing substrate.

4. Substrate Cleaning: Clean substrate of contaminants such as dirt, debris, oil, and grease that can affect adhesion of coating by power washing at maximum 2,000 psi (13,800 kPa).

    a. Dispose of waste water in accordance with requirements of authorities having jurisdiction.

5. Verify that existing substrate is dry before proceeding with application of coating. Spot check substrates with an electrical capacitance moisture-detection meter.

6. Verify adhesion of new products.

E. Existing Flashing and Detail Preparation: Repair flashings, gravel stops, copings, and other roof-related sheet metal and trim elements. Reseal joints, replace loose or missing fasteners, and replace components where required to leave in a watertight condition.

1. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings as detailed of same metal, weight or thickness, and finish.

F. Surface Priming: Prime surfaces to receive fluid-applied coating using coating manufacturer's recommended product for surface material. Apply at application rate recommended by manufacturer.

1. Ensure primer does not puddle and substrate has complete coverage.

2. Allow to cure completely prior to application of coating.

3.4 FLUID-APPLIED FLASHING APPLICATION

A. Fluid-Applied Flashing and Detail Base Coat Application: Complete base coat and fabric reinforcement at parapets, curbs, penetrations, and drains prior to application of field of fluid-applied membrane. Apply base coat in accordance with manufacturer's written instructions.

1. Apply base coat on prepared and primed surfaces and spread coating evenly. Extend coating minimum of 8 inches (200 mm) up vertical surfaces and 4 inches (100 mm) onto horizontal surfaces.

2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.

3. Reinforcing Fabric: Embed fabric reinforcement into wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.

    a. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.

3.5 FLUID-APPLIED MEMBRANE APPLICATION

A. Fluid-Applied Membrane Base Coat: Apply base coat to field of membrane in accordance with manufacturer's written instructions.

1. Apply base coat on prepared and primed surfaces and spread coating evenly.

2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.

3. Fabric Reinforcement: Embed fabric reinforcement into wet base coat. Lap adjacent pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.

    a. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.

B. Fluid-Applied Membrane Top Coat: Apply top coat to field of membrane and flashings uniformly in a complete, continuous installation.

1. Allow base coat to cure prior to application of top coat.

2. Following curing of base coat and prior to application of top coat, sand raised or exposed edges of fabric reinforcement.

3. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.

4. Apply top coat extending coating up vertical surfaces and out onto horizontal surfaces. Install top coat over field base coat and spread coating evenly.

5. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.

6. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

3.6 WALKWAY INSTALLATION

A. Install walkways following application of coating. Locate as indicated, or as directed by Owner.

B. Slip-Resistant Walkway Topcoat: Apply walkway second topcoat following application and curing of top coat. Locate as indicated on Drawings.

1. Mask walkway location with tape.

2. Prime first top coat prior to application of walkway top coat if walkway top coat is not applied within 72 hours of the first top coat application, using manufacturer's recommended primer.

3. Apply walkway topcoat and back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.

4. Broadcast Slip-Resistant Top Coat Aggregate in wet top coat at rate indicated in Part 2 product listing or as otherwise recommended by coating manufacturer.

    a. Back roll aggregate and top coat creating even dispersal of aggregate. Remove masking immediately.

3.7 FIELD QUALITY CONTROL

A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.

B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 2 full-time days on site, per 40-hour crew week, to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in Quality Control and Quality-assurance Guidelines for the Application of Membrane Roof Systems."

C. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation, and submit report. Notify Architect 48 hours in advance of dates and times of inspections. Inspect work as follows:

1. Upon completion of preparation of first component of work, prior to application of re-coating materials.

2. Following application of re-coating to flashings and application of base coat to field of roof.

3. Upon completion of re-coating but prior to re-installation of other roofing components.

D. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.

E. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

3.8 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 070150

SECTION 075216 SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing system on cementitious wood fiber deck and wood deck, including but not limited to:

a. Mechanically attached base sheet.

b. Vapor retarder / temp roof.

c. Thermal barrier where indicated.

d. Roof insulation.

e. Roof insulation cover board.

f. SBS-modified bituminous membrane roofing.

g. Membrane base flashings, and fluid applied flashings where indicated.

B. Related Sections:

1. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, wood cants, curbs, and blocking.

2. Division 07 Section "Roof Specialties" for manufactured copings and roof edge flashings.

C. Alternates: Refer to Division 01 Section "Alternates" for description of Work in this Section affected by alternates.

D. Allowances: Refer to Division 01 Section "Allowances" for description of Work in this Section affected by allowances.

E. Unit Prices: Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

1.2 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site

1. Meet with Owner, Owner's Consultant, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review drawings and specifications.

3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.

6. Review structural loading limitations of roof deck during and after roofing.

7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

8. Review governing regulations and requirements for insurance and certificates if applicable.

9. Review temporary protection requirements for roofing system during and after installation.

10. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacings and patterns for mechanically fastened components.

1. Base flashings and built-up terminations.

    a. Indicate details meet requirements of NRCA and FMG required by this Section.

2. Tapered insulation, including slopes.

3. Crickets, saddles, and tapered edge strips, including slopes.

4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

5. Membrane fastening or adhesion requirements.

C. Samples for Verification: For the following products:

1. Sheet roofing materials, of color specified for exposed material.

2. Metal termination bars.

3. Walkway materials.

D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers? names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.

1. Include letter from Manufacturer written for this Project indicating approval of Installer.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of compliance with performance requirements.

2. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing membrane, flashing sheets, adhesives and sealants.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.

E. Warranties: Unexecuted sample copies of special warranties.

F. Field Quality Control Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.

1. Submit reports within 48 hours after inspection.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

B. Warranties: Executed copies of warranties.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Owner's Consultant, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Approved manufacturer with UL listed and FM Global approved roofing systems comparable to those specified for this Project, with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.

1. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

2. Approved manufacturers must also meet separate requirements of Part 2 Products.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

2. An independent party certified as a Registered Roof Observer by the International Institute of Building Enclosure Consultants (formerly the Roof Consultants Institute) retained by the Contractor or the Manufacturer and approved by the Manufacturer.

D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. 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.

C. 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.

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

1.9 PROJECT / FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.

3. Remove temporary plugs from roof drains at end of each day.

4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.

1. Form of Warranty: Manufacturer's standard warranty form.

2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.

3. Warranty Period: 20 years from date of completion.

B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.

1. Inspections to occur in following years: 2, 5, 10, 15 following completion.

C. Installer Warranty: Installer's warranty signed by Installer, as follows.

1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.

2. Scope of Warranty: Work of this Section.

3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturer/Product: To establish an acceptable, minimum standard of quality, design and function, specifications and drawings have been based on the following Tremco Inc., Cold Process Modified Bitumen Roofing Systems, with products named in other Part 2 articles. Subject to compliance with requirements, provide the named product or comparable product system, meeting all specified performance criteria, by one of the following.

1. Garland Roofing.
2. SR Products.

B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing, or from a manufacturer approved by the membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Roofing System Design: Provide roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures calculated in accordance with ASCE-7 and the Massachusetts State Building Code, 780 CMR – 9th Edition (IBC 2015 with MA Amendments), and as follows:

1. Exposure Category: Exposure C.
2. Importance Factor: III.

3. Basic Wind Speed: 150 mph (Basic Wind Speed - V ult.)

C. The typical Low Slope Roofs (wood and steel decks) shall be designed and constructed to withstand the following minimum loading requirements as noted below, which have accounted for the Allowable Stress Design (ASD) Design Wind Load x Safety factor of 2 per ASCE 7-10:

1. Zone 1 (Field-of-Roof) Uplift Pressure: 62.7 psf.

2. Zone 2 (Perimeter) Uplift Pressure: 105.1 psf, located within 5 ft. of roof perimeter.

3. Zone 3 (Corners) Uplift Pressure: 158.2 psf, located within 5 ft. of roof outside corner.

D. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to ANSI/SPRI ES-1.

1. Minimum Design Pressure: 70 psf.

E. Flashings and Fastening: Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:

1. FM Global 1-49: Loss Prevention Data Sheet for Perimeter Flashings.

2. FM Global 1-29: Loss Prevention Data Sheet for Above Deck Roof Components.

3. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.

4. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.

5. Comply with requirements of Division 07 Section "Roof Specialties".

F. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

2.3 MATERIALS, GENERAL

A. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

2.4 ROOFING MEMBRANE MATERIALS

A. SBS Modified Bituminous Membrane Smooth-Surfaced Base Sheet, Ply Sheets and Vapor Retarder:

1. SBS-modified asphalt coated composite polyester / fiberglass/fiberglass mat reinforced high tensile strength base sheet, ASTM D4601 Type II.

a. Basis of design product: Tremco, BURmastic Composite Ply HT.

b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 165 lbf/in (725 N); Cross machine direction, 150 lbf/in (660 N).

c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 260 lbf (1150 N); Cross machine direction, 230 lbf (1120 N).

d. Thickness, minimum, ASTM D5147: 0.060 inch (1.5 mm).

B. SBS Modified Bituminous Membrane Granular-Surfaced Cap Sheet:

1. SBS/RET/Urethane-modified asphalt-coated composite polyester and glass-fiber-reinforced high-tensile strength sheet, white granular surfaced; ASTM D6162 Grade G Type III.

a. Basis of design product: Tremco, POWERply Endure 300 FR.

b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction 345 lbf/in (60 kN/m); Cross machine direction 340 lbf/in (60 kN/m).

c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 600 lbf (2665 N); Cross machine direction 580 lbf (2575 N).

d. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction 12 percent; Cross machine direction 8 percent.

e. Low Temperature Flex, maximum, ASTM D5147: -40 deg. F (-40 deg. C).

f. Thickness, minimum, ASTM D5147: 0.145 inch (3.7 mm) .

C. Flashing Sheet:

1. Thermoplastic PVC/TPA sheet, internally fabric reinforced, Energy Star qualified, CRRC listed, and California Title 24 Energy Code compliant, ASTM D4434 Type IV.

a. Basis of design product: Tremco, TPA Single Ply Roof Membrane.

b. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D751: 300 lbf/in (1330 N).

c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D751: 100 lbf (440 N).

d. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D751: 25 percent machine direction, 25 percent cross-machine direction.

e. Minimum Thickness, nominal, ASTM D751: 0.045 in (1.1 mm).

f. Color: White.

g. Solar Reflectance Index (SRI), ASTM E1980: 108 (White, initial) 84 (White, 3-year aged).

h. Recycled Content, minimum: 25 percent pre-consumer.

D. Fluid-Applied Flashing Material:

1. Polyurethane Roof Coating System Base Coat: Bio-based, low-odor low-VOC two-part, for use with a compatible top coat.

a. Basis of design product: Tremco, AlphaGuard BIO Base Coat.

b. Combustion Characteristics, UL 790: Maintains combustion characteristics of existing roof system.

c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 1 g/L.

d. Accelerated Weathering, 5000 hours, ASTM G154: Pass.

e. Hardness, Shore A, minimum, ASTM D2240: 80.

f. Solids, by volume, ASTM D2697: 100 percent.

g. Bio-Based Content, Minimum: 70 percent.

h. Minimum Thickness, Base Coat reinforced over Smooth BUR, MB, Concrete, Single-Ply: 48 mils (1.22 mm) wet.

2. Polyurethane roof coating system top coat, bio-based low-odor low-VOC two-part, for application over compatible base coat.

a. Basis of design product: Tremco, AlphaGuard BIO Top Coat.

b. Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system.

c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 6 g/L.

d. Solar Reflectance Index (SRI), ASTM E1980: For white, not less than 103.

e. Accelerated Weathering, 5000 hours, ASTM G 154: Pass.

f. Hardness, Shore A, minimum, ASTM D2240: 81.

g. Solids, by volume, ASTM D2697: 100 percent.

h. Bio-Based Content, Minimum: 60 percent.

i. Minimum Thickness, reinforced system: 32 mils (0.81 mm) wet.

j. Color: White.

3. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.

a. Basis of design product: Tremco, Permafab.

b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..

c. Elongation, Minimum, ASTM D1682: 60 percent.

d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..

e. Weight: 3 oz./sq. yd (102 g/sq. m).

E. Detail Fabric:

1. Woven Glass Fiber Mesh, Vinyl-Coated: Non-shrinking, non-rotting, vinyl-coated woven glass mesh for reinforcing flashing seams, membrane laps, and other roof system detailing and stripping.

a. Basis of design product: Tremco, BURmesh.

b. Tensile strength, 70 deg. F, min ASTM D146: Warp, 65 lbf/in (285 N); fill, 75 lbf/in (310 N).

c. Color: Aqua green.

2.5 COLD-APPLIED ADHESIVE MATERIALS

A. General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Modified Bituminous Adhesive for Vapor Retarder, Base-Ply, Interply and Cap Sheet:

1. Cold-applied low-odor low-VOC, two-part urethane roofing adhesive, formulated for compatibility and use with specified roofing membranes and flashings.

a. Basis of design product: Tremco, POWERply Endure BIO Adhesive TF.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3690: 0 g/L.

c. Low Temperature Flexibility, ASTM D2240: Pass at -30 deg F (-34 deg C).

d. Solids, by Volume, ASTM D2697: 100 percent.

C. Flashing Sheet Adhesive:

1. Bonding and Flashing Adhesive, SEBS/SIS modified asphalt, for elastomeric flashing membranes.

a. Basis of design product: Tremco, Sheeting Bond.

b. VOC, maximum, ASTM D3960: 250 g/L.

c. Adhesion in peel, minimum, ASTM D1876: 3 lbf/in (0.5 N/mm).

d. Lap shear adhesion, minimum, ASTM D816: 18 psi (124 kPa).

e. Color: White.

2.6 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

B. Stripping Adhesive / Sealer:

1. Seam Sealer: Aromatic polyurethane sealer, single-component, high solids, moisture curing, formulated for compatibility and use with a variety of roofing and flashing substrates.

a. Basis of design product: Tremco, GEOGARD Seam Sealer.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 189 g/L.

c. Tensile Strength, ASTM D412: 270 psi (1860 kPa).

d. Tear Strength, ASTM D412: 35 pli (6.13 kNm).

e. Elongation, ASTM D412: 220 percent.

f. Color: Gray.

2. Cold-applied roofing surfacing adhesive, one-part white solar reflective low-VOC polymeric water-based, formulated for compatibility and use with specified roofing membranes, and approved for stripping-in manufacturer's elastomeric flashing.

a. Basis of design product: Tremco, Rock-It-Adhesive WB.

b. Volatile Organic Compounds (VOC), maximum, ASTM D6511: 46 g/L.

c. Nonvolatile content, minimum ASTM D6511: 40 percent.

C. Stripping Reinforcing Fabric:

1. Woven Glass Fiber Mesh, Vinyl-Coated: Non-shrinking, non-rotting, vinyl-coated woven glass mesh for reinforcing flashing seams, membrane laps, and other roof system detailing.

a. Basis of design product: Tremco, BURmesh.

b. Tensile strength, 70 deg. F, min ASTM D146: Warp, 65 lbf/in (285 N); fill, 75 lbf/in (310 N).

c. Color: Aqua green.

D. Joint Sealant: Elastomeric joint sealant compatible with roofing materials, with movement capability appropriate for application.

1. Joint Sealant, Polyurethane: ASTM C920, Type S, Grade NS, Class 50 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints; paintable.

    a. Basis of design product: Tremco, TremSEAL Pro.

    b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 40 g/L.

    c. Hardness, Shore A, ASTM C661: 40.

    d. Adhesion to Concrete, ASTM C794: 35 pli.

    e. Tensile Strength, ASTM D412: 350 psi (2410 kPa).

    f. Color: Closest match to substrate.

E. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

F. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Roof Specialties"

G. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.7 ROOF INSULATION MATERIALS

A. Roof Insulation, General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

1. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.

2. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated, not less than two times the roof slope.

B. Roof Insulation:

1. Board Insulation, Polyisocyanurate: CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces, ASTM C1289 Type II Class 1.

a. Basis of design products: Tremco, Trisotech Insulation; Atlas, ACFoam II; Johns Manville, ENRGY 3, or other manufacturer approved and tested roof insulation.

b. Compressive Strength, ASTM D1621: Grade 2: 20 psi (138 kPa).

c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.

2.8 ROOF INSULATION ACCESSORIES

A. Insulation Cover Board / Thermal Barrier:

1. Gypsum panel, cellulosic fiber reinforced, water-resistant, ASTM C1278/C1278M.

a. Basis of design product: USG Securock, or other manufacturer approved and tested gypsum cover board / thermal barrier.

b. Thickness: 1/2 inch (13 mm).

B. Roof Insulation Adhesive:

1. Urethane adhesive, bead-applied, low-rise two-component solvent-free low odor, formulated to adhere roof insulation to substrate.

a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive, or other manufacturer approved and tested roof insulation adhesive.

b. Flame Spread Index, ASTM E84: 10.

c. Smoke Developed Index, ASTM E84: 30.

d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.

e. Tensile Strength, minimum, ASTM D412: 250 psi (1720 kPa).

f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.50 kN/m).

g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.

C. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.

D. Wood Cant Strips: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."

E. Tapered Edge Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.

F. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass fiber.

G. Base Sheet Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening of base sheet to substrate, and acceptable to roofing system manufacturer.

1. Basis of Design Product for Cementitious Wood Fiber Roof Deck: Trufast Twin Loc-Nails, formed from coated steel with integral 2.7" diameter plate and stainless steel locking staples, or other manufacturer approved and tested base sheet fasteners and plates.

1. Basis of Design Product for Wood Roof Deck: Simplex MAXX Cap Fasteners, with dual-nail and integral 3" diameter, perforated, flexible polymer stress plate, or other manufacturer approved and tested base sheet fasteners and plates.

2.9 WALKWAYS

A. Walkway Material:

1. Walkway pads, ceramic-granule-surfaced reinforced asphaltic composition slip-resisting pads, manufactured as a traffic pad for foot traffic, 1/2 inch (13 mm) thick minimum.

a. Basis of design product: Tremco, Trem-Tred.

b. Flexural Strength at max. load, minimum, ASTM C203: 218 psi (1.5 kPa).

c. Granule adhesion (weight loss), maximum, ASTM D4977: 1.1 gram.

d. Impact Resistance at 77 deg. F (25 deg. C), ASTM D3746: No Damage to Roof.

e. Pad Size: 36 by 48 inch (914 by 1220 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.

2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. Cementitious Wood Fiber and Wood Roof Decks: Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6mm) out of plane relative to adjoining deck.

B. Verify that substrate is sound and dry.

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

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. 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.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s written instructions, approved shop drawings, and Contract Documents.

B. Install wood cants, blocking, curbs, and nailers in accordance with requirements of Division 06 Section "Miscellaneous Rough Carpentry."

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

3.4 ROOFING INSTALLATION DETAILS

A. FM Installation Details: Install roofing membrane, base flashings, wood cants, blocking, curbs and nailers and component materials in compliance with requirements in FMG 4470 as part of a

membrane roofing system as listed in FMG's "Approval Guide" for fire/windstorm classification indicated. Comply with recommendations in FMG Loss Prevention Data Sheet 1-49.

B. NRCA Installation Details: Install roofing system in accordance with applicable NRCA Manual Plates and NRCA recommendations; modify as required to comply with manufacturer's approved details and perimeter fastening requirements of FM Global references if applicable.

3.5 BASE SHEET INSTALLATION

A. At Cementitious Wood Fiber and Wood Roof Decks install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Mechanically fasten to substrate to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

2. At Cementitious Wood Fiber Roof Deck: Base sheet fasteners and plates spaced at 6” o.c. in 4” side laps with 4 equally spaced center rows spaced at 12” o.c., or as required by the manufacturer to meet performance requirements.

3. At Wood Roof Deck: Base sheet fasteners and plates spaced at 12” o.c. in 2” side laps with 2 equally spaced and staggered center rows spaced at 12” o.c. Decrease spacing in corners to 6” o.c., or as required by the manufacturer to meet performance requirements.

3.6 VAPOR RETARDER INSTALLATION

A. Vapor Retarder / Temp Roof Installation, General: Completely seal vapor retarder/air barrier/temp roof at terminations, obstructions, and penetrations to prevent air movement into roofing system. Seal vapor retarder/air barrier to air barrier in adjacent construction at perimeter of roofing system.

B. SBS Modified Sheet Vapor Retarder: Install one lapped vapor retarder course over mechanically attached base sheet and adhere in a uniform application of cold-applied adhesive, according to roofing system manufacturer's written instructions.

3.7 SUBSTRATE BOARD / THERMAL BARRIER INSTALLATION

A. Where indicated, install substrate board / thermal barrier with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

1. Adhere gypsum substrate board / thermal barrier to mechanically attached base sheet and fully adhered vapor retarder using approved low-rise foam adhesive to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

2. Using approved battery-operated applicator apply 3/4”-1” wide adhesive beads to the substrate or insulation board in ribbons uniformly spaced a minimum of 6 inches on center, or as required by the manufacturer to meet performance requirements.

3.8 INSULATION INSTALLATION

A. Comply with roofing manufacturer's written instructions for installing roof insulation.

B. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday

C. Cant Strips: Install and secure preformed 45-degree cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

D. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated.

1. Where crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of two times the roof slope, not less than 1/4 inch in 12 inches (1:48).

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

F. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (70 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

1. Tapered Insulation System on Flat Roof Deck: Install insulation at minimum thickness as follows:

a. Minimum total thickness of Continuous Insulation: 5.2 inches.

b. Continuous Insulation R-value: Not less than LTTR-30.

2. Insulation Drain Sumps: Tapered insulation sumps, not less than 2 by 2 ft. (600 by 600 mm), sloped to roof drain; sump to maximum depth of not more than 1 inch (25 mm) less than the Project-stipulated continuous insulation thickness based upon code requirements.

G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

H. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

I. Adhered Insulation Application Method: Install each layer of insulation and adhere to substrate as follows:

1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

2. Using approved battery-operated applicator apply 3/4”-1” wide adhesive beads to the substrate or insulation board in ribbons uniformly spaced a minimum of 6 inches on center, or as required by the manufacturer to meet performance requirements.

J. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together. Tape joints if required by roofing manufacturer.

1. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover in place.

2. Using approved battery-operated applicator apply 3/4”-1” wide adhesive beads to the substrate or insulation board in ribbons uniformly spaced a minimum of 6 inches on center, or as required by the manufacturer to meet performance requirements.

3.9 COLD-APPLIED ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in NRCA's "Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing" and as follows:

1. Number of Smooth-Surfaced SBS-Modified Asphalt Sheets: Two.

a. Adhering Method: Cold-adhesive applied.

2. Granular-Surfaced SBS-Modified Asphalt Cap Sheet:

a. Adhering Method: Cold-adhesive applied.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing agencies engaged or required to perform services for installing roofing system.

D. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new roofing.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.

3. Remove temporary plugs from roof drains at end of each day.

4. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.10 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane base-ply sheet, ply sheet(s) and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

2. Embed each sheet in cold-applied membrane adhesive applied at rate required by roofing manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Install roofing membrane sheets so side and end laps shed water. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.

3.11 HEAT-WELDING CAP SHEET SEAMS

A. Cap Sheet Seam Heat-Welding: Prepare and weld seams according to roofing manufacturer's written instructions.

1. Clean minimum 4 inch (102 mm) wide seam area on both surfaces to be joined. Remove debris and contaminants. Allow seam to thoroughly dry prior to performing welding.

2. Continuously weld 4 inch (102 mm) wide seam using roofing manufacturer's recommended automatic heat welding machine or hand-held heat gun. Roll seam with minimum 75 lb. (34 kg) steel roller.

3.12 FLASHING AND STRIPPING INSTALLATION

A. Base Flashing Installation, General: Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Extend base flashing up walls or parapets a minimum of 12 inches (300 mm) above modified bituminous roofing and 6 inches (150 mm) onto field of built-up roofing.

2. Prime substrates with primer if required by roofing system manufacturer.

B. Flashing Sheet Installation: Adhere flashing sheet to substrate in cold-applied adhesive. Apply cold-applied flashing sheet adhesive to back of flashing sheet if recommended by roofing manufacturer.

1. Flashing Sheet Top Termination: Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

   a. Seal top termination of base flashing with a metal termination bar and a continuous bead of joint sealant.

2. Flashing Sheet Bottom Termination: Adhere flashing sheet to roofing membrane and in continuous bed of cold-applied flashing adhesive.

   a. Elastomeric Flashing Sheet: Heat weld vertical flashing joints. Seal bottom termination of base flashing by adhering to roofing membrane with cold-applied adhesive and sealing flashing-to-membrane joint with approved stripping.

C. Fluid-Applied Flashing Application: Apply base coat with embedded fabric reinforcement and top coat at parapets, curbs, penetrations, and drains in accordance with manufacturer's written instructions.

1. Prepare and prime all substrates with compatible primer in accordance with manufacturer's written instructions.

2. Apply fully reinforced base coat to achieve minimum wet mil coating thickness indicated in Part 2 product listing, unless greater thickness is recommended by manufacturer.

3. Apply top coat over flashing base coat and spread coating evenly to achieve minimum wet mil coating thickness indicated in Part 2 product listing, unless greater thickness is recommended by manufacturer.

4. Seal top termination of base flashing with a continuous bead of joint sealant.

D. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

E. Install stripping, according to roofing manufacturer's written instructions, where metal flanges and edgings are set on modified bituminous membrane roofing.

F. Flashing-Sheet Stripping: Install flashing-sheet stripping in a continuous coating of compatible mastic/adhesive sealer and reinforcing fabric, as recommended by roofing manufacturer, and extend onto roofing membrane. Apply number of courses recommended by manufacturer. Neatly top-dress with UV stable surfacing adhesive and embedded granules to match cap sheet.

G. Roof Drains: Set 30 by 30 inch (760 by 760 mm) square metal flashing in bed of compatible mastic/adhesive sealer on completed roofing membrane. Cover metal flashing with roofing membrane cap sheet stripping and extend a minimum of 6 inches (150 mm) beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

1. Install stripping according to roofing system manufacturer's written instructions.

3.13 WALKWAY INSTALLATION

A. Walkways, General: Install walkways according to roofing manufacturer's written instructions.

1. Install walkways at following locations:

a. Where indicated on Drawings.

B. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.

1. Sweep away loose aggregate surfacing.

2. Set walkway pads in cold-applied adhesive.

3.14 FIELD QUALITY CONTROL

A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.

B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 2 full-time days on site, per 40-hour crew week, to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in NRCA's "Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing Systems."

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation at commencement and upon completion.

1. Notify Owner's Consultant and Owner 48 hours in advance of date and time of inspection.

D. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.15 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Owner's Consultant and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 076000 FLASHINGS AND SHEET METAL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01000 as part of this Section.

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

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

D. It is the intent of the Specifications and the Drawings to require that the construction be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

A. Furnish and install metal flashings required to complete the roofing application according to details and specified herein. This includes but is not limited to the following:

1. Remove and replace all existing metal flashings, including all fascia, gutters, roof penetrations, counter-flashings, expansion joints and all other metal flashings as indicated herein.
2. Furnish and install new concealed fastener interlocking aluminum flat seam panels and related self-adhering high temperature waterproof membrane on rising walls as indicated on the drawings.

B. The drawings indicate and show limits of construction for this project. The specifications specify material and work requirements for this project. Both are complementary to each other and both shall be followed to complete the work.

1.03 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Section 02 05 00 - Selective Demolition

2. Section 06 10 00 – Rough Carpentry and Wood Blocking

3. Section 07 52 16 – SBS Modified Bituminous Membrane Roofing

1.04 SUBMITTALS

A. Submit complete shop drawings of all sheet metal flashing and trim in accordance, including but not limited to:

1. New perimeter fascia & gutter details all roof areas.

2. New roof area divider-expansion joint flashing details.

3. New concealed fastener interlocking aluminum flat seam panels.

4. Other detailing that may be requested by the Owner, or their designated representative.

B. Do not commence fabrication of any work or begin installation until approval has been obtained from the Owner.

1.05 PROJECT CONDITIONS

A. Work shall be performed only during dry weather and applied to dry surfaces with all materials entirely free of moisture.

1.06 CODES AND STANDARDS

A. Except as modified by the requirements of other governing codes and by this specification, work shall conform to the provisions and recommendations of the following codes and standards:

1. All copper work shall be in accordance with the latest published literature of Revere Copper Company (Copper & Common Sense).

2. Metal installation shall be in accordance with the Architectural Sheet Metal Manual published by the Sheet Metal and Air Conditioning Contractor National Association, Inc. (SMACNA).

3. Comply with all requirements and recommendations of Factory Mutual's Loss Prevention Data 1-49 for FM Approved Perimeter Flashing system, flashing material thickness, fastener types, sizes, and spacing.

1.07 QUALITY ASSURANCE

A. All personnel concerned with the shop fabrication and field installation of sheet metal work must be qualified sheet metal journeymen who may be assisted by sheet metal apprentices qualifying for their journeyman status. The foreman of the crew must have at least five (5) years experience in sheet metal work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Four (4) lb. sheet lead for roof drain flashings, soldered flanges and other miscellaneous conditions, applications.

B. Sixteen (16) oz. zinc coated copper for plumbing-vent sleeves, cylindrical sleeve/umbrella flashings, pitch-pockets, slip-flashings, thru-wall scupper sleeves and other flashing details in-contact with copper or lead-coated copper components.

C. Prefabricated fascia with a continuous extruded aluminum anchor bar with pre-punched fastener holes, and a 24 Ga. Galvanized Steel or .040" Aluminum high performance coated fascia cover. Tremlock 215 Fascia MB by Tremco Inc. or other equivalent FM Approved, ANSI/SPRI ES1 tested and approved fascia system:

1. Fabricate to size and profile indicated from manufacturer's standard profile dimensions and as indicated in the project details.

2. Provide all related splice plates, fasteners, sealants and accessories compatible with manufacturer's elastomeric membrane flashing sheet for a complete system sections with minimum length of 144 IN , but not exceeding 12 FT .

3. Joint Style:
   a. 1/4 IN Butt Joint with 12 IN wide, exposed cover plate.

D. Prefabricated parapet coping with 20 Ga. sloped galvanized steel cleats with pre-punched fastener holes, spaced per manufacturers installation specifications, and a 24 Ga. Galvanized Steel or .040" Aluminum high performance coated fascia cover. Tremlock Infinity Flush Coping by Tremco Inc. or other equivalent FM Approved, ANSI/SPRI ES1 tested and approved fascia system:

1. Fabricate to size and profile indicated from manufacturer's standard profile dimensions and as indicated in the project details.

2. Provide all related splice plates, fasteners, sealants and accessories compatible with manufacturer's elastomeric membrane flashing sheet for a complete system sections with minimum length of 144 IN , but not exceeding 12 FT .

3. Joint Style:
   a. 1/4 IN Butt Joint with 12 IN wide, exposed cover plate.

E. Prefabricated fascia drip edge with a continuous 22 Ga. Galvanized Steel cleat with pre-punched fastener holes, and a 24 Ga. Galvanized Steel or .040" Aluminum high performance coated fascia cover, and 24 Ga. Galvanized Steel formed gutter where indicated. Tremlock Drip Edge & Gutter by Tremco Inc. or other equivalent FM Approved, ANSI/SPRI ES1 tested and approved fascia system:

1. Fabricate to size and profile indicated from manufacturer's standard profile dimensions and as indicated in the project details.

2. Provide all related splice plates, fasteners, sealants and accessories compatible with manufacturer's elastomeric membrane flashing sheet for a complete system sections with minimum length of 96 IN , but not exceeding 12 FT .

3. Provide stainless steel gutter brackets and related fasteners at gutter for a complete installed gutter system per manufacturer's specifications.

F. Forty (40) mil. (.050 in.), aluminum sheet-metal with Kynar-500 / Hylar 500 high performance finish for use at concealed fastener interlocking wall panels, surface-mounted counterflashings, and other flashing details in-contact with aluminum components.

1. Finish: All aluminum sheet metal is to be coated with a 2-coat system using a combination of Kynar 500® / Hylar 5000 High Performance, two coat system consisting of a fluorocarbon base top coat over a quality matched primer, with the same primer on the back side for additional protection.

2. Warrantee: All aluminum sheet metal is to be warranted for A 20-yeaar, non-prorated warranty covering color, fade, chalking and film integrity

3. Color: Standard/stock color choices are to be provided to the Owner for selection by the Owner.

G. Solder for lead coated copper shall be 60% block tin and 40% pig lead conforming to ASTM Specification B32, Sn 40.

H. Flux shall be non-acid type flux manufactured specifically for use with sheet copper.

2.02 FASTENERS

A. For attaching sheet metal to masonry, use 3/16" diameter mushroom-head, stainless-steel anchors.

B. For attaching sheet metal to wood, use twelve (12) gauge copper wire slating nails, sufficient length to provide 1.5" embedment into the substrate.

C. Fasteners for attaching aluminum sheet-metal to wood blocking, use flat-head, diamond-point, round barbed-shank roofing nails:

1. Gauge: 6061-T913 alloy wire.
2. Length: Sufficient to penetrate underlying wood blocking 1-1/4 inches, minimum.
3. Pop-rivets used for the attachment of sheet metal components shall be fabricated from compatible components as required to avoid galvanic reactions. Match fasteners with sheet metal as follows:

Sheet Metal Type	Fasteners Type and Material		
	Nails	**Screws**	**Rivets**
Aluminum	Aluminum or Zinc	Aluminum or Zinc	Aluminum or Zinc
Copper	Copper	Bronze	Copper

D. For attaching stainless-steel sheet-metal to wood blocking, use FS FF-N-105B, Type II, Style 20, roofing nails; galvanized steel wire, flat-head, diamond-point, round, barbed shank.

E. For attaching termination bar/metal to masonry, use 3/16" x 2" zinc plated flat head screw type masonry fastener.

F. Provide bituminous coating or EPDM gaskets to isolate dissimilar materials as shown on the drawings.

PART 3 - EXECUTION

3.01 WORKMANSHIP

A. Workmanship for sheet metal shall be as follows:

1. Surfaces to be covered with sheet metal shall be free from defects of every description and clean of dirt and other foreign matter before sheet metal work is started.

2. Lines, arises and angles shall be sharp and true. Plane surfaces shall be free from waves and buckles. Joints and seams in plain surfaces shall be avoided as far as possible.

3. Sheet metal work exposed to the weather shall be permanently watertight and weather tight, with suitable provisions made for free expansion and contraction without causing leaks.

4. Exposed edges shall be doubled back 1/2 inch in such a manner as to conceal them and provide stiffness.

5. No nails shall be exposed on the face of the finished work except as approved by the Owner or except as directed herein.

6. Solder all lock seams at pipe vent and rail posts sleeves.

3.02 INSTALLATION (GENERAL)

A. Install metal flashing in accordance with manufacturer's recommendations.

B. Finish work to be free from water leakage under all weather conditions.

C. Sheet metal panel lines, brakes, and angles are to be sharp and true, and surfaces free from objectionable wave, warp, or buckle. Fold exposed edges of sheet metal back 1/2 inch to form an inside hem.

D. Install electrolytic insulation or coating materials between dissimilar metals. Avoid to the greatest extent practical, using dissimilar metals in contact with each other.

E. All exposed new sheet metal work shall be cleaned at completion of installation. Grease and oil films, handling marks, contamination from steel wool, fitting and drilling debris shall be removed and the work scrubbed clean.

F. Prime all exposed sheet metal surfaces that come into contact with new built-up roofing and flashing

G. Proceed with flashing work concurrently to membrane installation to prevent water intrusion into the roof assembly.

H. Fasteners exposed to weather shall utilize EPDM washers between the fastener head and the metal flashing.

I. All new exposed metal surfaces shall be free of dents, creases, waves, scratch marks, and solder or weld marks. Daily cleanup and removal from the site of all shavings, clippings, shearing, rivets, fasteners, and whatever other debris resulting from these operations are required.

J. Prime all exposed sheet metal surfaces that come into contact with new built-up roofing and flashing.

K. Clean and protect flashing system from damage and wear during remainder of construction period.

END OF SECTION

SECTION 077100 GUTTERS, DOWNSPOUTS AND SNOW GUARDS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Fabrication and installation of new gutter and downspout work indicated, including hangers, brackets, end caps, prefabricated mitered corners, and tie into existing decorative downspouts and related collector boxes to remain.

1. The roofing contractor shall furnish and install new Gutters at roofing areas indicated for a complete system as specified.

2. The roofing contractor shall furnish and install new snow guards at areas indicated for a complete pan style snow guard system as specified.

3. Provide new leaf diverter cap on all new gutters as specified.

4. See Bid Form Alternates and Unit Costs for additional requirements.

1.02 RELATED WORK

A. Carefully examine all of the Project Documents for requirements that affect the work of this Section. The exact scope of work of this Section cannot be fully-determined without a thorough review of all specification sections and other Project Documents. The Project Manual/Bid Form and General Notes to the Bidding Contractors apply to the work of this section.

1. Related Sections (include but are not limited to the following):

   a. Section 02050 - Selective Demolition

   b. Section 06100 - Rough Carpentry

   c. Section 070150 – Rehabilitation of Single Ply Roofing

   d. Section 073110 - Asphalt Shingles

   e. Section 074113 – Metal Standing Seam Roof Panels, Ventilated

1.03 SUBMITTALS

A. Shop Drawing: Submit plans indicating location of gutters and downspouts.

B. Product Data: Submit catalog cuts of all products and materials proposed for use.

C. Full size sample of snow guard, gutter and bracket showing finish and profiles for approval of the Owner.

PART 2 – PRODUCTS

2.01 RAIN DRAINAGE COMPONENTS

A. Prefinished metal for gutters and downspouts shall be prefinished aluminum .032" minimum thickness with Kynar coating system. – Color: Match existing.

B. Gutters: Pre-finished aluminum .032" minimum thickness, 5 inch, K-Style profile to match existing gutters to remain.

C. End Caps: Pre-finished aluminum .032" minimum thickness, end caps.

D. Hanger Units: Stainless steel concealed gutter hangar system, complete with rods and nuts. Spacing 18" o.c. maximum.

E. Snow Guards: Pan style snow guards shall be Alpine Snowguard PD10 Zinc or approved equal. Install in areas indicated in standard three (3) row pattern per manufacturer's specifications.

F. Leaf Diverters: To fit existing and new gutter sizes; "Gutter Solution" top mount high velocity screen hybrid system or approved equal. "Gutter Solution" information available at guttersupply.com. See "Add Alternates".

PART 3 – EXECUTION

3.01 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 18" inches apart, unless indicated otherwise. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 20 feet apart. Install expansion joint caps.

2. Install top mount high velocity screen hybrid leaf diverter cap on both new gutters and existing gutters to be removed and re-installed per manufacturer's specifications.

C. Downspouts: Existing decorative downspouts and collector boxes are to remain. Join sections with manufacturer's standard telescoping joints. Align new gutter drainage inserts with existing downspout locations and connect securely to existing downspout.

3.02 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 15400 CAST IRON ROOF DRAINS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The work under this Section consists of work related to the replacement of all existing, in place roof drain assemblies. Work includes, but is not entirely limited to the following:

1. Roof Drain Replacement Work:

a. The Contractor shall provide any required modifications to the existing concrete or steel roof deck openings to facilitate the proper installation of the new cast iron roof drains, insulation, galvanized sump pan receivers and any/all related hardware.
b. The Contractor shall provide and install new cast iron roof drain assemblies to replace existing drain assemblies. The new drains are to be sized to match the existing drain components. The new components include cast iron drain bowls, cast iron strainers, cast iron clamping rings, under deck clamps, galvanized sump pan receivers, and stainless-steel drain bolts.
c. Provide new "no-hub" clamps at all pipe joints and connections.
d. Ensure that all plumbing work related to this project is installed in strict compliance with all aspects of applicable building/plumbing codes.

B. All roof drain lines are to be mechanically-cleaned for a distance of fifty (50) feet at the completion of the work. Leave all roof drains in a free-flowing condition, immediately after the installation/completion of the drain/plumbing work.

1.02 RELATED WORK

A. Carefully examine all of the Contract Documents for requirements that affect the work of this Section. The exact scope of work of this Section cannot be fully-determined without a thorough review of all specification sections and other Contract Documents.

1. Related Sections (include but are not limited to the following):

a. Section 02050 - Selective Demolition
b. Section 06100 - Rough Carpentry
c. Section 07220 – Thermal Insulation Components
d. Section 07600 – Flashings & Sheet Metal

1.03 SUBMITTALS

A. Provide the following required product/material data:

1. Roof drain assemblies (cast iron bowls, cast iron strainers, cast iron clamping rings, stainless steel drain bolts, and related items).
2. No hub clamps.
3. Pipe clamps.
4. Sump pan receivers.
5. Pipe insulation and hard wrap PVC coverings.
6. Pipe hanger components.
7. Miscellaneous plumbing accessories and related items.

1.04 DELIVERY, HANDLING AND STORAGE

A. Contractor shall comply with all recommendations of the pipe manufacturer and of applicable Technical Reports of the Cast Iron Soil Pipe Institute for handling and installation.

B. All work and materials shall be protected at all times. The Contractor shall make good all damage caused by his workmen either directly or indirectly.

C. All work shall be installed and completed by a licensed plumber. All work shall be in accordance with the State Plumbing Code and the best trade practices.

D. The Contractor shall do all carting, handling, and hoisting for his materials and equipment in a safe and satisfactory manner. Any damage resulting from the work of this section shall be repaired or paid-for by the Contractor, and at no additional cost to the Owner.

1.05 CODES AND STANDARDS

A. Perform all plumbing work in strict compliance with the current publication of the applicable building/plumbing Code.

1.06 COORDINATION

A. Work related to the installation of new roof drains shall be performed prior to or in conjunction with the actual removal and replacement of the surrounding roofing system.

B. The Contractor will not be permitted to install new roof drains after the installation of the new roofing system. All new roofing work shall be installed onto the drain rims of the new roof drains, not cut-into the roof after the new roofing system has been installed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Roof drains shall be Smith #1010 as manufactured by the Smith Manufacturing Co., Montgomery, Alabama or approved equivalent product. Provide all necessary companion accessories, including, but not limited to the following:

1. Cast iron drain bodies.
2. Cast iron domes.
3. Under deck clamps.
4. Galvanized, sump-pan receivers (as required).
5. Bolted clamping rings.
6. Stainless-steel drain bolts.

B. Pipe Joints: Provide “no hub” clamps as manufactured by Ideal Inc.

PART 3 - EXECUTION

3.01 DRAIN INSTALLATION

A. Provide and install new roof drains flush with the height of the surrounding roof decking.

B. Provide and install new galvanized sump pans at the location of all new roof drains located through the roof deck.

C. Provide and install all required roof drain supports at drain locations.

D. Provide new “no hub” connections at junctures at pipe joints. Ensure a watertight connection between the roof drain bowls and drainage piping.

E. Install new roof drains in accordance with the manufacturer's recommendations, ensuring the flange is flush with the roof deck and all compression seal connections are proper to create a positive watertight connection with the drain leader piping.

F. At the completion of the Work, and in the presence of the Owner (or their designated representative) mechanically-clean all roof drains for a distance of at least fifty (50) feet. Ensure that all new drains are free flowing, without accumulated debris or other impediments.

END OF SECTION