Exhibit B-1

NEW JERSEY WATER SUPPLY AUTHORITY

HUNTERDON COUNTY, NEW JERSEY

ROOF REPLACEMENT AT THE ROUND VALLEY RESERVOIR WHITEHOUSE RELEASE STRUCTURE

WSA-B27003

AUGUST 2026
FINAL

JOHN RUSCHKE
Professional Engineer - NJ Lic. No. 37148

MOTT MACDONALD

497

102005-NF

TABLE OF CONTENTS

DIVISION **SECTION TITLE**

DIVISION 1 – GENERAL REQUIREMENTS
01000 GENERAL REQUIREMENTS
01010 ADDITIONAL INFORMATION
01020 SPECIAL PROJECT PROCEDURES
01030 COORDINATION
01040 FIELD ENGINEERING
01050 REGULATIONS
01060 ALTERNATES
01080 PROJECT MEETINGS
01090 SUBMITTALS
01100 QUALITY CONTROL
01110 CONSTRUCTION FACILITIES AND TEMPORARY UTILITIES
01120 MATERIAL AND EQUIPMENT
01130 SPECIAL CONDITIONS

DIVISION 2 – EXISTING CONDITIONS
02070 SELECTIVE DEMOLITION

DIVISION 6 – WOOD AND PLASTICS
06100 ROUGH CARPENTRY

DIVISION 7 – THERMAL AND MOISTURE PROTECTION
07015.19 PREPARATION FOR REROOFING
07521 STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING
07620 SHEET METAL FLASHING AND TRIM
07710 ROOF SPECIALTIES
07920 JOINT SEALANTS

SECTION 01000
GENERAL REQUIREMENTS

PART 1: GENERAL

1.01 CONTRACT DOCUMENTS

The Contract Documents for this work are identified in the Article of the Contract entitled Definitions

The Detailed Specifications consist of four (4) Divisions as follows:

Division 1 - General Requirements
Division 2 - Existing Conditions
Division 6 - Wood and Plastics
Division 7 - Thermal and Moisture Protection

1.02 WORK INCLUDED

The following information is part of this Division:

01000 - General Requirements
01010 - Additional Information
01020 - Special Projects Procedures
01030 - Coordination
01040 - Field Engineering
01050 - Regulations
01060 - Alternates
01070 - Measurement and Payment
01080 - Project Meetings
01090 - Submittals
01100 - Quality Control
01120 - Material and Equipment
01130 - Special Conditions

1.03 PROJECT DESCRIPTION

The Contractor is to furnish all labor, materials and equipment required for the project and related construction for the bid price. The work is to be coordinated by the Contractor.

The Contractor is to provide administrative and scheduling personnel as well as provide all the labor, superintendence, materials, plant, tools, and equipment necessary and required for properly performing and completing the work as described and more particularly specified within the time stipulated. The Contractor is to furnish all material, equipment, and labor necessary to complete his work in accordance with the terms of this Contract and the requirements thereunder, including all general and detailed Specifications hereinafter outlined.

The description of the work is:
Demolition Scope of Work

- Removal of the existing roofing system down to the concrete roof deck.
- Remove existing base flashings, roof edge flashings, accessories, wood blocking, curbs, nailers, and fasteners associated with the existing roof system.
- Provide temporary roofing and weather protection during demolition and replacement operations.
- Protect existing facilities and maintain operations during construction.
- Remove and dispose of all demolished roofing materials off-site.

Scope of Work

- Prepare and inspect the existing concrete roof deck following roof removal.
- Furnish and install SBS modified bituminous roofing system consisting of:
    - Torch-applied SBS-modified bitumen base ply.
    - SBS-modified bitumen interply suitable for receiving the liquid-applied membrane.
    - Seamless, fully reinforced PMMA liquid-applied membrane system, including flashing and accessories.
    - Associated roofing accessories and sealants.
- Furnish and install wood blocking and nailers as required.
- Furnish and install sheet metal flashing and trim, including counterflashings, penetration flashings, and related accessories.
- Furnish and install roof edge fascia and roof specialty components.
- Furnish and install all required joint sealants for a complete watertight system.
- Provide manufacturer inspections, testing, submittals, warranties, and closeout documentation for a complete roofing system.

This description generally defines the work to be undertaken on this project and is to be supplemented by the remaining Contract Documents.

The construction schedule is to be coordinated with the Owner and the Engineer. Regularly scheduled job meetings are to occur at least monthly during the full contract period and thereafter as may be necessary.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

Not Used

* * * * *

SECTION 01010
ADDITIONAL INFORMATION

PART 1: GENERAL

1.01 INSURANCE AND TIME LIMITS

The Contractor is to refer to the appropriate sections of the Contract pages for insurance requirements and time limits relating to project completion.

1.01 PATENTS AND COPYRIGHTS

NOT IN CONTRACT.

1.03 GUARANTEES

SEE THE ARTICLE OF THE CONTRACT ENTITLED “GUARANTEE”.

1.04 SECURITY

SEE THE ARTICLE OF THE BID INFORMATION ENTITLED “SECURITY REQUIREMENTS”.

1.05 OTHER CONTRACTS

The Owner may have other contracts with work related to the work of the Contractor. The Contractor is to cooperate with other contractors with regard to storage of materials and execution of the work. It is the Contractor's responsibility to inspect all work by other contractors affecting his work and to report to the Owner any irregularities which will not permit him to complete his work in a satisfactory and timely manner. His failure to notify the Owner of such irregularities indicates the work of other contractors has been satisfactorily completed to receive his work. The Contractor is not responsible for defects of which he could not have known, which develop in the work of others after the work is completed. Where work under this Contract is to be connected to work under other contracts, it is the responsibility of the Contractor to measure the completed work in place and report to the Owner immediately any difference between completed work by others and the provisions of the Contract Documents.

1.06 WITNESS TESTING

All testing of materials and equipment specified under the various sections of these Contract Documents is to be witnessed by the Engineer or the Owner. Contractor will give the Engineer and Owner reasonable advance notice of such testing and will make reasonable accommodations for the Engineer to witness such testing.

1.07 RIGHT TO KNOW LABELING

All containers are required to provide New Jersey Right-to-Know labeling.

All containers, including shipping cartons, shall bear a label indicating the chemical name(s) and Chemical Abstracts Service number(s) of all hazardous substances in the container, and all other substances which are among the five most predominant substances in the container, or their trade secret registry number(s). (NJAC 8:59-5).

"Container" means a receptacle used to hold a liquid, solid or gaseous substance such as bottles, bags, barrels, boxes, cans, cylinders, drums and shipping cartons. (NJAC 8:59-1.3).

1.08 EXTRA MATERIAL ON HAND

Existing facilities which are to be expanded or modified are sized and located in accordance with the best information available. The Contractor shall be prepared to accommodate changes in the size or location by maintaining at the job site additional pipe, fittings and valves in the ranges of sizes being dealt with. This additional material shall be available to prevent delays in construction.

PART 2: PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

* * * * *

SECTION 01020
SPECIAL PROJECT PROCEDURES

PART 1: GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, equipment, materials and means necessary to provide and maintain facilities required by the engineer and regulatory agencies for the project. The cost for all equipment and services provided under this section shall be included in the lump sum prices bid and no additional payments will be considered by the Owner.

PART 2: PRODUCTS

2.01 PHOTOGRAPHS

The Contractor is to refer to the appropriate section of the Information for Bidders for requirements on monthly progress photographs.

PART 3: EXECUTION

3.01 EMERGENCY TELEPHONE

The Contractor is to maintain telephones at all times after regular working hours, including weekends and holidays, where he or his representatives can be reached on an emergency basis. The Contractor or his representatives are to be prepared to act to correct conditions on the site deemed to constitute an emergency by either the Owner, his agent, the Engineer, or local authority, but he is not to wait for instructions before proceeding to properly protect both life and property. If a condition on the site requires attention after working hours, either the Owner, agent, Engineer, or local authority may call the Contractor or his representatives at the emergency telephone number, identify himself and describe the emergency condition. The Contractor is expected to dispatch men and equipment to adequately institute corrective measures within two (2) hours. If, for some reason, the Contractor or his agent cannot be reached at the emergency number after a reasonable time (½-hour), the Owner will have the right to immediately initiate corrective measures in accordance with the Article which follows, covering Emergency Services to Correct Hazardous Conditions, and the Contractor will be considered to have waived any right to perform emergency service.

3.02 EMERGENCY SERVICES TO CORRECT HAZARDOUS CONDITIONS

In the event that the Contractor fails to maintain safe job conditions or traffic conditions, including, but not limited to, trench settlement and hazardous piling or storage of backfill or construction materials, the Owner, after failure of the Contractor to commence substantial steps at the job site to rectify the situation within two (2) hours of the time the contractor has been notified, pursuant to the preceding paragraph, of the unsafe conditions, may hire guards, take such precautions, make such repairs and take any other steps which the Owner or the Owner's agent, in its discretion, considers necessary to protect the property, persons, or the Owner. The cost of any of these precautions, guards, or steps will be deducted from the payments due the Contractor, and the Contractor will be billed for these services, work, and materials at prevailing rates.

3.03 NOTIFICATION TO UTILITY COMPANIES AND OWNERS OF BURIED PIPELINES

The Contractor is to comply with all provisions of the “Underground Facility Protection Act” (Public Law 1994, Chapter 118). The Contractor is to give notice at least three (3) business days and not more than ten (10) business days prior to the start of any work in the vicinity of existing utilities or appurtenances to the Garden State Underground Plant Location Service (N.J. One-Call System at 1-800-272-1000). The Engineer is to be furnished, in writing, with the date such notice was given and the Garden State Underground Plant Location Service "Markout Confirmation Number", prior to the start of any work. In addition, it is the responsibility of the Contractor to notify the Owner of any utility which is not a member of the “N.J. One-Call System”.

3.04 WORK IN BAD WEATHER

During freezing, stormy or inclement weather, no work is to be done except such as can be done satisfactorily and in a manner to secure first-class construction throughout.

When required, protection is to be provided by use of tarpaulins, wood and building paper shelters, or other acceptable means.

During cold weather, materials are to be preheated, if required, and the materials and adjacent structure into which they are to be incorporated are to be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging or drying will result. Protected spaces are to be artificially heated by approved means which will result in a moist or dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar are to be sufficiently heated so that the mixture will be warm throughout when used.

The Contractor shall also take measures to prevent run-off from entering the work area.

* * * * *

SECTION 01030
COORDINATION

PART 1: GENERAL

1.01 WORK INCLUDED

The review and coordination of shop drawings, actual execution of the work, and testing between general construction work, equipment and piping installation, pertinent instrumentation and electrical work is the responsibility of the Contractor.

The Engineer will check each shop drawing submitted to determine whether it complies with the intent of the Contract Documents and the design. This same requirement is placed on the Contractor and his supplier.

It is the intention of the Contract Documents to place various materials of construction and related requirements in their proper place both on the Drawings and in the specifications. However, no guarantee is made that such locations are, in every instance, where the Contractor might expect to find them.

The Contractor is required to provide, or make available, all of the Contract Documents to each vendor and subcontractor, both prior to bid to ensure proper Proposals, and during construction to insure compliance with the intent of the Contract Documents. This is the sole responsibility of the Contractor.

The Engineer is not responsible for project coordination between various subcontractors, which is the responsibility of the Contractor. The Engineer will observe, by attendance at regularly scheduled job meetings, the orderly flow and progress of the work. The various subcontractors and those people responsible to them are required to interact with each other to insure that the work progresses in an orderly fashion and without exceeding the time allotted in the Contract.

The Contractor is to refer to the appropriate section of the Contract Documents which defines the limitations of the Engineer's responsibilities.

The Contractor is responsible for reading all the Specifications and following the various Contract Drawings. His review of all the Contract Documents as well as shop drawings, coordination drawings and other information required to complete the project is his sole responsibility. He is to request clarification on any matters where ambiguities might exist, in order to receive instruction as to the proper documents to follow.

All products or materials which require the selection of color finishes are to be submitted early and with sufficient lead time to permit the Owner or his Engineer or Architect to develop an overall color coordination system for use by the Contractor in the final installation. Delays in submitting such product or material samples or color charts at one time may delay the selection process and prevent the Contractor from granting suppliers final releases for fabrication.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

3.01 WORKING HOURS

The Contractor should generally limit on-site construction operations and activities between the hours of 7:00 am to 3:30 p.m. unless stricter limitations are established by the Owner. The Contractor shall notify the project Engineers/Inspectors by 1:00 pm if they need to work past 3:30 pm that day. The Owner will not guarantee access outside normal business hours but will consider all reasonable requests on a case by case basis.

Contractor work on State Holidays shall be at the discretion of the Authority. If work is to be proposed by the Contractor on a weekend or Holiday, the request shall be made with sufficient time for review and to schedule staffing if approved.

* * * * *

SECTION 01040
FIELD ENGINEERING

PART 1: GENERAL

1.01 METHOD OF CONSTRUCTION

Before starting the work and from time to time during its progress, the Engineer may request the Contractor to outline to the Engineer the methods he plans to use in performing the work and the various steps he intends to take.

1.02 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Engineer may furnish the Contractor with additional instructions and detailed drawings as may, in the opinion of the Engineer, be required to clarify the work included in the Contract. The additional drawings and instructions, thus supplied to the Contractor, will be coordinated with the Contract Documents and will be so prepared that they can be reasonably interpreted as a part thereof. The Contractor is to carry out the work in accordance with any additional detailed drawings and instructions. Additional instructions and detail drawings are not to be considered extra work.

1.03 CHANGES IN DESIGN

If, during construction, it is found expedient by the Contractor to modify or change the design of any part of the facility, including the equipment or any part thereof, completely detailed and checked working drawings showing the proposed changes are to be submitted to the Engineer for his review. Any permitted modification or change of design as set forth above is to be at the sole discretion of the Engineer. Approval of such changes does not release the Contractor from his obligation or guarantees, nor are any of the conditions of the Contract abrogated thereby. Any additional costs, including redesign costs to this Contract resulting from these changes, are to be borne by the Contractor. The Contractor is further to note the Contract Article entitled “Changes and Extra Work”.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

Not Used

* * * * *

SECTION 01050
REGULATIONS

PART 1: GENERAL

1.01 WORK INCLUDED

All work under this Contract is to comply with all applicable requirements of Federal, State and local statutes, regulations, and codes, and especially the safety provisions contained therein.

Certain work to be done within the scope of this Contract may be required to meet the specification of persons, municipalities or bodies other than the Owner. The Contractor is to be responsible for obtaining the approval and acceptance of his completed work by such persons, municipalities, counties and similar bodies. Such work may include, but is not to be restricted to installation of sidewalks, curbs, pavement or utilities; plumbing, electrical and building construction work or other incidental work required to complete the Contract.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

3.01 ENVIRONMENTAL PROTECTION

The Contractor is to minimize environmental impact due to his construction operations during all phases of his work. This shall include, but is not limited to, **prohibition** of the following construction procedures.

1. Dumping of spoil material into any stream corridor, any wetlands, any vernal habitats, any surface waters, any sites listed or eligible for listing on the New Jersey or National Registers of Historic Places or any unspecified locations.
2. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, wetlands, vernal habitats, or surface waters.
3. Pumping of silt-laden water from trenches or other excavations into surface waters, stream corridors, wetlands or vernal habitats.
4. Damaging vegetation adjacent to or outside of the access road or the right of way.
5. Disposal of trees, brush, and other debris in any stream corridors, wetlands, vernal habitats, surface waters, or at unspecified locations.
6. Permanent or unspecified alteration of any flow line of any stream.
7. Open burning of project debris.
8. Use of calcium chloride, petroleum products, or other chemicals for dust control.
9. Use of asphaltic mulch binder.
10. Any unpermitted discharge of sewage.
11. Discharge of test waters with high chemical disinfectants or other pollutant concentrations.

3.02 LABOR, SAFETY, HEALTH AND SECURITY REGULATIONS

The Contractor is to refer to the appropriate portions of Information for Bidders regarding Labor, Safety, Health and Security Regulations.

The Contractor shall provide to the Owner and the Engineer, in writing, prior to beginning any work, the names and emergency telephone numbers of the Contractor's "competent person" or "competent persons" as defined in 29 CFR Section 1926.32 (f), one or more of whom shall be present at the construction site at all times, whenever construction activities are taking place. Prior to beginning any work, the Contractor shall also submit emergency action plans, where applicable and as required by OSHA, Title 29 CFR, Part 1910 and Part 1926.

The Contractor is to keep on proper lights each night between the hours of sunset and sunrise at and upon all portions of his work; upon all sites in connection with the work, when required by law or regulations, or when deemed necessary by the Owner or by the proper authorities, or when required by the liability insurance coverers, and is to be solely responsible for all injuries and damages resulting from neglect or failure to comply with the provisions of the Contract in this respect. Night lighting must be so sized, concentrated and located so as to cast sufficient illumination around new construction and excavations. All excavations and obstructions must be properly marked, lighted and provided with railing and other guards. Openings in the floor must be secured at the end of each day.

The Contractor is to maintain sufficient guards by day and night to prevent accidents of any kind or character whatsoever, and will be solely liable for any damage which may arise from any negligence on his part or that of his agents and employees.

If, at any time, in the opinion of the Owner or the Engineer, the work is not properly lighted, barricaded, and in all respects safe in respect to public travel, persons on or about the work, or public or private property, the Owner and the Engineer will have the right, but not the obligation, to order such safeguards to be erected and such precautions to be taken as he deems advisable, and the Contractor is to promptly comply with such orders. If, under such circumstances, the Contractor does not or cannot immediately put the same into proper and approved condition or if the Contractor or his representative is not upon the grounds so that he can be immediately notified of this insufficiency of safety precautions in accordance with the procedures for notification of the Contractor specified under "Emergency Telephone", then the Owner may put the work into such a condition that it shall be, in his opinion, safe and the Contractor is to pay all expenses of such labor and materials as may have been used for this purpose by him or by the Owner. Such action of the Owner and/or Engineer, or their failure to take such action, will in no way relieve the Contractor of the entire responsibility for any cost, loss, or damage by any party sustained on account of the insufficiency of the safety precautions taken by the Contractor or by the Owner acting under authority of this Section.

3.03 SANITATION

Sanitary conveniences, properly screened from public observation, for the use of all persons employed on the work and beginning with the first persons engaged in preliminary operations, are to be provided and maintained by the Contractor in sufficient numbers, in such a manner and at such locations as will be approved. Sanitary facilities are to be completely self-contained, chemically treated and regularly serviced.

3.04 SALES TAX EXEMPTION

The Contractor is to refer to the Information for Bidders regarding sales tax exemptions.

3.05 FIRE SAFETY

The Contractor is held responsible and is to maintain conditions which promote fire safety in his operations at all times. Materials which could constitute a fire hazard such as gasoline, paints, wood and paper products are to be safely stored.

* * * * *

SECTION 01060
ALTERNATES

PART 1: GENERAL

1.01 WORK INCLUDED

In order to establish standards of quality, the Engineer, in the detailed Specifications, may have referred to certain “Brand Name” products by name and/or catalog number. This procedure is not to be construed as eliminating from competition other products of equivalent or better quality by other suppliers or manufacturers where fully suitable in design and manufacture.

The Contractor's bid must be based upon the materials and equipment named in the Specifications, or materials and equipment of equivalent quality and effectiveness. The first named supplier shall be considered as the standard of reference, for the Engineers design and for the equivalency determination to be made by the Engineer.

A. Proprietary Goods and Services

Engineer may require Contractor to provide certain specified goods and services that are proprietary in nature. In such cases, the goods and services may be purchased by stipulating the proprietary goods and services in the bid specification in any case in which the resolution authorizing the contract so indicates, and the special need for such proprietary goods or services is directly related the performance, completion or undertaking of the purpose for which the contract is awarded.

B. Equivalent Materials and Equipment

Following execution of the Contract with the successful bidder, the Contractor may then submit to the Engineer for consideration the use of materials and equipment which the Contractor believes to be equivalent to or better than those specified. Requests for review of equivalent items of material and equipment will not be accepted by the Engineer from anyone other than the Contractor.

To be considered an equivalent, the materials and equipment must be shown by the Contractor to meet all requirements of the Specifications herein; be of similar type, function and quality; be cost effective, as compared to the materials and equipment named, in all respects, including first costs, operating costs and maintenance costs; and must perform satisfactorily.

C. Substitution of Materials and Equipment

The procedure to be followed for review of proposed substitutions for the materials and equipment not equivalent to those specified is as follows:

Requests for review of substitute items of material and equipment will not be accepted by the Engineer from anyone other than the Contractor. If the Contractor wishes to furnish or use a substitute item of material or equipment, the Contractor shall make a written application to the Engineer for acceptance thereof, certifying that the proposed substitute will be similar and of equal or better substance and quality to that specified, will be suited to the same use and will perform properly the same functions as that specified.

The application will state whether or not acceptance of the substitute for use in the work will require a change in the Drawings or Specifications to adapt the design to the substitute and whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified shall be identified

in the application and available warranties, maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such a substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the Engineer in evaluating the proposed substitute.

The Engineer may require the Contractor to furnish, at the Contractor's expense, additional data about the proposed substitute. The Engineer will be the sole judge of acceptability and no substitute will be ordered or installed without the Engineer's prior written acceptance. The Owner may require the Contractor to furnish, at the Contractor's expense, a special performance guarantee or other surety with respect to any substitute including without limitations the anticipated reduction of the Contract Price.

D. Furnishing of Different Materials or Equipment: Substitute and Equal

The following provisions shall apply to the furnishing of materials or equipment that are substitutes for or that are to be considered as equals to those called for in the specifications.

As used herein, “equivalent” or “equal” materials or equipment refers to materials or equipment that are essentially the same as those which were specified, but come from a different manufacturer, and may therefore have minor differences but do not require any redesign, or construction changes to accommodate.

It shall be the responsibility of the Contractor to ensure that materials and equipment to be furnished, including any substitute or any equal materials or equipment, fit the space available. The Contractor shall make necessary measurements to ascertain space requirements, including those for connections.

All redesign and other additional costs incurred by the Owner as a result of the Contractor's furnishing substitute or equal materials or equipment shall be borne by the Contractor.

All materials and equipment must be new unless expressly stated otherwise in the Contract Documents.

The Contractor is responsible for providing documentation for review by the Engineer of any proposed substitute materials or equipment and any proposed equal materials or equipment so as to enable the Engineer to determine if the proposed materials or equipment are acceptable. For any proposed substitute materials or equipment, the Engineer will record the time required by the Engineer and the Engineer's consultants in evaluating the Contractor's proposals for any substitutions for items named in the specifications and in making changes in the Drawings or Specifications occasioned thereby.

Whether or not the Engineer accepts a proposed substitute, the Contractor shall reimburse the Owner for the charges of the Engineer and the Engineer's consultants for evaluating any proposed substitution for named items. All redesign and other additional costs incurred by the Owner as a result of the Contractor’s furnishing substitute materials or equipment shall be borne by the Contractor. The owner shall bear the cost of reviewing “proposed equivalent or equal” materials and equipment.

Following review and written acceptance by the Engineer and Owner, the Contractor may proceed with ordering and installing the substitute materials and equipment, or the equivalent or equal materials and equipment, as the case may be.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

Not Used

* * * * *

SECTION 01070
MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.01 DESCRIPTION

A. The items listed below beginning with Article 1.04, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, Contractor's field office, layout surveys, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, heat, maintaining traffic, removal of waste, watchmen, bonds, insurance, mobilization and demobilization, environmental protection and erosion control, and all other requirements of the General Conditions, Supplementary Conditions, General Requirements and other sections of the Contract Documents, or which can be reasonably inferred therefrom. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and extra work unit price pay items listed herein.

B. Each lump sum and supplemental unit bid price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item, unless otherwise specifically noted.

1.02 ESTIMATE OF QUANTITIES

A. Estimated quantities for extra work unit price pay items, as listed in the Form of Bid, are approximate only and are included solely for the purpose of comparison of Bids. Owner does not expressly or by implication agree that the nature of the materials encountered or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as Owner may deem necessary. Contractor will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work ordered by Engineer in writing.

1.03 RELATED PROVISIONS

A. Payments to Contractor: Refer to Contract.

B. Changes in Contract Price: Refer to Contract.

1.04 BASE BID ITEMS

Item 1 – Whitehouse Release Structure Roof Improvements, Complete

Measurement and Payment: The lump sum payment for Item 1 will be full compensation for completing the Work, as shown on the Drawings, indicated in the Specifications, or which can be reasonably inferred therefrom, including mobilization of equipment and materials necessary to complete the Contract work to the project site.

Base Bid shall include 100 SF of deck patching, per detail in Contract Drawings. Submit a unit price per square foot for the specified decking work. The Contract Sum shall be adjusted based on actual field-verified quantities. Quantities exceeding 100 SF shall be added to the Contract Sum using the submitted unit price, and quantities less than 100 SF shall be deducted from the Contract Sum using the same unit price.

* * * * *

SECTION 01080
PROJECT MEETINGS

PART 1: GENERAL

1.01 PRECONSTRUCTION CONFERENCE

Before construction is started, preconstruction conferences shall be held. During the first conference the Owner, his Engineer, and the Contractor will discuss the procedures to be followed by the Contractor during the construction process.

1.02 JOB MEETINGS

The Engineer may schedule regular job meetings at least monthly during the life of the Contract. The time and location of meetings is to be set by the Engineer. The Contractor, unless otherwise notified by the Engineer, is to have authorized representatives attend each meeting. Additional meetings may be called as progress of work on the project requires.

The purpose of these meetings is for maintaining communication between the Owner, Engineer and Contractor, including the Contractor's subcontractors and suppliers. The meetings are to be used to coordinate various parts of the work, update construction schedules, prepare progress estimates and respond to questions which may be raised by the various participants.

The Engineer will preside over the job meetings and will be responsible for recording minutes of the meetings. The Engineer will distribute minutes of the meetings to meeting participants.

Attendants at job meetings shall include the Owner, Engineer, the Contractor and subcontractors (as may be required or specifically requested by the Owner/Engineer).

Meeting agendas shall be established by the Engineer and shall include the following general items:

a. Review/approve minutes of prior meeting;
b. Review work completed since the prior meeting;
c. Review compliance with construction and shop drawing submittal schedules;
d. Identify problem areas of the construction and shop drawing submission schedules and develop responses to resolve the problems;
e. Establish detailed short-term construction schedule to identify work to be completed prior to the next job meeting;
f. Identify special building shut-downs or Owner interaction required to complete the planned work;
g. Review construction site procedures and safety measures;
h. Establish date(s) for upcoming meetings and special agenda items;

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

Not Used

* * * * *

SECTION 01090
SUBMITTALS

PART 1: GENERAL

1.01 WORK INCLUDED

This section covers a variety of different types of documents, drawings, and material which the Contractor is to provide to the Engineer or Owner for his approval, information, or use. Submittals will include, but not be limited to: bonds, bid price breakdown, construction schedule, shop drawing schedule, shop drawings, samples, color charts, operating and maintenance manuals, parts lists, spare parts and materials, special tools and guarantees.

These items are to be submitted as specified in this Division and other Divisions of the Specifications, in the proper quantities, and in a timely manner.

1.02 SUBMITTALS

A. Shop, Coordination, Setting and Installation Drawings and Samples

The Contractor shall promptly submit to the Engineer with notification provided to the Owner, digital copies of detailed shop drawings, guaranteed test curves, and manufacturer's specifications for all equipment, tools and furnishings to be supplied under this Contract.

The Contractor shall submit these data with such promptness as to avoid delay in the work. In no case shall shop drawings be submitted later than 90 days after Contract signing. Mechanical items, electrical items, instrumentation, reinforcing steel, and other items requiring long lead times and extensive review time shall be submitted first. Items requiring a lesser degree of lead time or review time may be submitted toward the end of this 90 day period. In order for the Contractor to be deemed to have fulfilled this requirement, his individual submissions must be complete in every respect so that a logical and orderly review might follow. Piecemeal submissions are not acceptable. Final submissions for approval must be complete in all respects.

When dimensions are of particular importance, the drawing must be certified by the manufacturer as correct for this project.

The Engineer will review submitted data within a reasonable time after receipt of such data considering the complexity and completeness of such submissions. He shall determine at his sole discretion whether the data submitted are sufficient to render a decision. Resubmission of drawings by the Contractor for the Engineer's approval must be completed within thirty (30) days of the return of the previous submission by the Engineer, unless the Engineer specifically agrees to the contrary.

No materials, equipment or specialties are to be purchased, fabricated or released until the Engineer has approved the shop or working drawings as conforming to the contract requirements. All materials and work involved in the construction shall then be as represented by such drawings.

Shop drawings are to be not smaller in size than 8-½″ x 11″ nor larger than 30″ x 42″. Reproductions of the Engineer's drawings will not be acceptable as shop drawings. Before submitting shop drawings, the Contractor must check and sign all drawings, noting thereon any deviation from the Contract Drawings and Specifications.

Digital copies of shop drawings, test curves, or other material are to be submitted for approval.

Following his review, the Engineer will return the shop drawing to the Contractor. If shop drawings are checked “Amend and Resubmit” by the Engineer, the Contractor must resubmit digital copies of the revised shop drawings, which will be returned to the Contractor by the Engineer.

The Contractor is to be responsible for furnishing subcontractors with approved shop drawings as required. No shop drawings are to be used for construction, ordering, fabrication or other reasons unless marked “No Exceptions Taken” or “Make Corrections Noted” by the Engineer.

The Contractor is to note the difference in action expected by the Engineer with regard to Engineer required drawings such as shop, coordination and installation drawings, and those which are presented by the Contractor, by his own choice, and for his convenience. Engineer required drawings are to be construed as those which define shop systems work, parts drawings, fabrication drawings, test reports, certifications, and manufacturer's installation requirements. These will be reviewed and stamped appropriately by the Engineer after detailed review.

Contractor's coordination and/or installation drawings which are presented at his option are to be construed as those which assist the Contractor in his orderly execution of the work. Such drawings will be reviewed by the Engineer only as a convenience afforded the Contractor and shall not be stamped by the Engineer.

All Engineer required drawings are to be stamped by the Contractor certifying his review and approval thereof. The stamp is to bear the following information:

APPROVED FOR CONTRACT REQUIREMENTS

The Contractor's signature below indicates that he has checked the drawing with the Contract Drawings and Specifications and found it to meet all requirements of same including dimensions, and that the Contractor's guarantee fully applies to the specified material or equipment.

RE: Specification Section _____ Page No._____ Paragraph No.

Drawing Sheet_____ By:_____
Signature/Contractor

Approval of any shop drawings, manufacturer's specifications, or other material by the Engineer does not relieve the Contractor of the responsibility for:

a) Errors of any sort in shop or setting drawings or schedules.
b) Deviations from Contract Drawings or Specifications unless the Contractor has given written notice to the Engineer of any such deviations at the time of submission.
c) Responsibility for proper performance of his work.
d) Coordination with other trades.
e) Safety and security on the job site.

Data must include dimensions, detailed drawings, and manufacturer's specifications for all items. Specific data required are set forth under the various Specifications items, but in general, are to include characteristics and efficiency curves for all motors and pumps, as well as weights of equipment to be delivered.

When required by the specifications, the Contractor is to furnish duplicate samples of materials, finishes or other items proposed to be used in the work. All materials, finishes and workmanship incorporated in the work are to be similar and equal to the approved samples. The Engineer shall retain such samples until final acceptance of the project and return only those samples specifically

requested.

The Contractor is to prepare and submit to the Engineer for approval, a schedule fixing the respective dates for the submission of shop or setting drawings; the beginning of manufacture, testing and installation of materials, supplies and equipment; and the completion of the various parts of the work. Such schedules will be subject to change from time to time in accordance with the progress of the work. Major emphasis will be placed on the submission of the shop drawing schedule which is to include submittal dates, time of starting manufacture, time of testing at place of manufacture where applicable and date of delivery.

B. Operating and Maintenance Instructions

The Contractor is to furnish six (6) sets of approved operating and maintenance instructions, completely covering the operation and maintenance of all process equipment; heating, ventilating and air conditioning equipment; plumbing and electrical work; automatic controls and instrumentation. In addition, he is to neatly frame one (l) set of concise operating and maintenance instructions and control diagrams for each trade and deliver them to the Owner. Manuals are to be bound in hard covers and include, as a minimum, the following for each piece of equipment and device:

l. Manufacturer's descriptive literature.

2. Maintenance instructions, including recommended lubricants and lubrication schedule, spare parts, parts lists and assembly drawings.

3. Troubleshooting and repair information and charts.

4. As-installed control diagrams, including color coded wiring diagrams for all electrical motor controller connections and interlock connections with other mechanical equipment.

5. Step by step operating instructions for each piece of equipment and system, including preparation for starting, shutdown and draining, and emergency operation.

6. Performance data.

7. Copies of all approved Shop Drawings.

8. Recommended spare parts lists, including part numbers.

9. Provided spare parts listing, including part numbers.

Each item of equipment is to be identified by a permanently attached nameplate made of brass or other corrosion-resistant metal with incised letters and bearing the following information:

l. Manufacturer's name and address

2. Serial and model numbers

3. Rated Capacity

4. Temperature, pressure or other limitations

All operating and maintenance instructions are to be submitted prior to the Contract reaching fifty (50%) percent of completion.

C. Coordination/Composite Drawings

As soon as practical, but in no case later than 60 days after the award of the Contract, the Contractor shall prepare layout drawings of all process piping and electrical systems for the areas being constructed and or modified at an appropriate scale to depict the work to be undertaken.

The coordination/composite drawings shall show process piping and similar features as well as the locations of all valves and valve operations that will require access for regular service and maintenance. Also included on the coordination/composite drawings shall be valve operators, instrumentation, electrical panels and similar features as may be required to determine potential interferences with other plant equipment and systems. The coordination/composite drawings shall be prepared to determine potential conflicts in the routing of new facilities and shall be submitted to the Engineer for review. Following review by the Engineer, the Engineer will advise the Contractor of the basis for resolving conflicts, should they exist. The Engineer shall provide mark-ups of the coordination/ composite drawings to the Contractor, who shall be responsible to coordinate with the various subcontractors/disciplines. The Contractor shall make revisions to the coordination/composite drawings for distribution to subcontractors and the Owner/Engineer for as-built purposes.

Record copies of final composite drawings shall be retained by the Contractor, Owner and Engineer for reference during construction. All shop drawings shall be compared by the Contractor to the coordination/composite drawings prior to submittal of the shop drawings for review to determine if conflicts exist. Revisions to the drawings that may become necessary during the progress of construction shall be made by the Contractor and revised copies of the drawings shall be distributed for record purposes.

D. Payment Schedule and Cost Breakdown

Prior to submission of first invoice, the Contractor is to have submitted and received approval on a cost breakdown which may be used in preparing the monthly requisition for payment. The breakdown is to be in sufficient detail to facilitate a meaningful and fair estimate of work in place as evaluated by the Engineer. Any unrealistic breakdown of work which is anticipated early in the construction period may be cause for rejection of the breakdown and require resubmittal prior to payment of first invoice.

The cost breakdown is to define costs associated with individual subcontracts by key elements.

PART 2: PRODUCTS

2.01 SPECIAL TOOLS

The Contractor is to furnish with each equipment item furnished, all special tools required and recommended by the manufacturer. This requirement is in no way intended to cover the furnishing of readily available tools for mechanical work.

PART 3: EXECUTION

3.01 CERTIFIED TEST REPORTS

Any materials for which specific performance standards are established shall be tested prior to shipment to the field by the manufacturer in order to demonstrate compliance with the specified standards. Compliance with the specified standards shall also include compliance with applicable codes and standards as outlined in the Contract Documents and as customarily required by industry standards. The Contractor shall advise the Engineer a minimum of two weeks in advance of shop testing and the Engineer may elect to witness the testing procedures.

The equipment manufacturer shall prepare and submit for review, digital copies of actual test data and summary reports on the testing performed. The reports shall summarize the test data, provide detailed interpretation of the test data; provide test data curves that demonstrate compliance with applicable standards. The test reports shall be certified to be true and accurate by an authorized representative of the manufacturer and shall bear the manufacturers notarized signature.

Certified test reports shall be forwarded to the Engineer for review and equipment shall not be shipped to the project site until the Engineer notifies the Contractor in writing that the test reports are acceptable.

3.02 RECORD DRAWINGS

The Contractor is to keep accurate records of all deviations of his work from that shown on the Drawings, and indicate the actual construction with colored lines on a set of white drawings.

During the course of construction, the Engineer reserves the right to examine the Contractor's record drawings to ascertain whether adequate effort is being afforded to the record drawings. The Contractor's failure to properly maintain accurate record drawings may result, at the option of the Owner, in sufficient monies being retained from the Contractor's progress pay estimates to cover the costs of maintaining proper records.

After completion of the project, the Contractor is to turn over to the Engineer one (l) set of white drawings and one PDF file indicating thereon a complete record of any changes or revisions which exist in the completed work. These drawings are to be used to assist and supplement the Engineer in his preparation of “Record Drawings”.

* * * * *

SECTION 01100
QUALITY CONTROL

PART 1: GENERAL

1.01 CONFORMANCE TO DRAWINGS AND SPECIFICATIONS

All work is to conform during its progress and upon its completion truly to the lines, levels and grades indicated on the Drawings or given by the Engineer and is to be built in a thoroughly substantial and workmanlike manner, in accordance with the Drawings, Specifications and directions given from time to time by him. In no case will any work in excess of Drawing requirements and Specifications be paid for, unless ordered in writing by said Engineer.

1.02 DIMENSIONS OF EXISTING STRUCTURES

The Contractor is to verify in the field, the dimensions and locations of existing structures, where an error or incomplete information relative to the location or dimension of existing structures would affect the construction to be done under this Contract. The Contractor is to verify such dimensions and locations before continuing with the construction work to the point where it would be affected.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

3.0 CLEAN-UP

During the course of construction all efforts must be made to maintain a neat and orderly project. Clean-up is to be pursued on a regular basis and in conjunction with the construction. The Contractor is to be responsible for clean-up during the life of this Contract with the full cooperation of all subcontractors. Upon completion of all construction, final clean-up is to include removal of all excess materials, equipment, backfill, etc., and the site is to be restored to a condition equal to or better than that existing prior to construction. Should the Contractor fail to remove such material, equipment and supplies, the Owner has the right to remove them at the expense of the Contractor.

* * * * *

SECTION 01120
MATERIAL AND EQUIPMENT

PART 1: GENERAL

1.01 CONSTRUCTION EQUIPMENT

Bidders are to familiarize themselves thoroughly with the type and nature of the equipment required in the proper execution of the work, and are to use and employ only first class equipment. Previously used equipment must be in safe, first-class working order and condition. Sufficient equipment must be furnished and used by the contractor to permit the completion of the work within the time specified. The equipment used on any portion of the work is to be such that no injury or damage to the streets, adjacent property, or utilities will result from its use.

PART 2: PRODUCTS

2.01 MATERIALS

Unless otherwise indicated on the Drawings or specified, only new materials are to be incorporated into the work. All materials furnished by the Contractor, to be incorporated into the work, may be subjected to the inspection and approval of the Engineer. No material is to be processed, fabricated, or delivered to the work without the prior approval of the Engineer, except at the risk of the Contractor.

As soon as possible after the Contract has been executed, the Contractor is to submit, to the Engineer, data relating to materials he proposes to furnish for the work. Such data are to be in sufficient detail to enable the Engineer to identify the particular product in question and to form an opinion as to its conformity to the Contract requirements.

Facilities and labor for the handling and inspection of all materials are to be furnished by the Contractor. Defective materials must immediately be removed from the site of the work.

If the Engineer so requires, either prior to beginning, or during the progress of the work, the Contractor is to submit samples of materials for such specific tests as may be necessary to demonstrate that the materials conform to the Specifications. Such samples are to be furnished, taken, stored, packed, and shipped as directed, at the expense of the Contractor. Except as otherwise noted, the Owner will make arrangements for and pay for tests.

All samples are to be packed so as to reach their destination in good condition and are to be so labeled as to indicate the materials represented, the name of the building or work and location for which the material is intended, and the name of the Contractor submitting the sample. To ensure consideration of samples, the Contractor is to notify the Engineer by letter that the samples have been shipped and is to properly describe the samples in the letter. In no case is the letter of notification to be enclosed with the samples.

The Contractor is to submit data and samples, or place his orders, sufficiently early to permit consideration, inspection, testing, and approval before the materials are necessary for incorporation in the work. Any delay resulting from his failure to do so is not to be used as the basis of a claim against the Owner or the Engineer.

When required, the Contractor is to furnish to the Engineer, in quadruplicate, sworn copies of manufacturer's shop or mill tests, or reports from independent testing laboratories relative to material data.

PART 3: EXECUTION

3.01 CUTTING AND PATCHING

The Contractor is to do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as may be required by the Drawings and Specifications to complete the structures. He is to restore all such cut or patched work to a condition which receives the approval of the Engineer. Cutting of structures that may endanger the work, adjacent property, workers or the public is not to be done.

3.02 DELIVERY AND STORAGE

The Contractor is to deliver equipment and materials to the site and store them in original containers suitably sheltered from the elements, but readily accessible for inspection until installed. He is to store all items subject to moisture damage (such as controls and electrical equipment) in dry, heated spaces. All excavated materials, construction equipment and materials to be incorporated in the new work are to be so placed as not to damage the work and so placed that free access may be had at any time to all parts of the work and to all public utility installations in the vicinity of the work. If insufficient area is available, the Contractor is to provide off-site areas at his own expense. Materials are to be kept neatly piled and compacted and conveniently stored so as to inconvenience, as little as possible, public travel and adjoining tenants.

3.03 SERVICE OF MANUFACTURER'S REPRESENTATIVES

The Contractor is to provide the services of a skilled and experienced representative of each manufacturer supplying equipment under this Contract, for such periods as, are satisfactory to the Engineer, are essential for the proper and satisfactory installation and testing of the equipment, and training of the Owner's personnel in its use. In certain instances, particular specification sections may indicate the minimum number of visits and/or hours required to comply with the intent of the specifications regarding services of manufacturer's representatives.

3.04 MATERIALS AND EQUIPMENT TO SUIT DESIGN

The Contractor is to be responsible for ensuring that all materials and equipment furnished by him fit the spaces provided in the construction. He is to make all necessary field measurements and is to order only those materials and equipment which can be accommodated in the spaces provided.
Where materials or equipment are approved which occupy more or less space than is shown on the Drawing or is available, and which require different arrangements from those shown on the Drawings, or which require any modifications of the structures or other equipment or connections, the Contractor is to install the equipment so as to operate properly and in harmony with the intended design and is to provide all labor, materials and equipment necessitated by such rearrangements or modifications at his own expense. Should any such changes cause the Owner to incur redesign costs, the actual redesign costs for said changes are to be deducted from the total contract amount due the Contractor.

Except as noted above, materials and equipment which do not conform to the requirements of the Contract Documents; do not fit the space requirements and arrangements shown; are not equal to samples reviewed by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended, are not to be furnished nor installed by the Contractor and will not be paid for by the Owner.

For the purpose of avoiding conflicts with other trades and adjoining work, where more than one article, device, product, material, fixture, form or type of construction is referred to by proprietary name, manufacturer, make or catalog number, the FIRST NAMED has generally been used as the basis of design and detail.

Any and all additional costs to other trades resulting from the installation of any equipment other than the FIRST NAMED, including equivalents and substitutions, are to be paid for by the Contractor without any

additional compensation whatsoever.

It is also the responsibility of the Contractor requesting the use of equivalent or substitution materials and equipment other than that specified for the basic design to verify that it meets all indicated space requirements.

3.08 TEMPLATES AND FOUNDATION BOLTS

In order to insure the proper setting of all foundation bolts or fastenings, the Contractor is to furnish all templates for the equipment or fastenings, and furnish and set all bolts, guides, and fastenings required for the installation of the materials/equipment at such times as the progress of the Contract work requires. All fastening bolts and nuts shall be of stainless steel.

If bolts or fastenings must be reset, or if drilling is required in the final installation, such work is to be done without further payment than is included in the lump sum price bid for the work of this Contract.

* * * * *

SECTION 01130
SPECIAL CONDITIONS

PART 1: GENERAL

1.01 WORK INCLUDED

The Contractor is to review the Drawings and Specifications to determine the extent of the work. **The Contractor shall review all existing conditions related to the location, configuration, and connections of any existing equipment which may be impacted by the required work. The Contractor shall identify methods necessary to remove and replace equipment.**

Contractors may request and arrange a site visit with the Owner prior to bid, if they choose to do so (refer to Invitation for BIds). Questions regarding the bid will not be answered during the site visit.

Before proceeding with any work, the Contractor is to confirm methods of construction, obtain field measurements and verify all dimensions on the Drawings as required.

Failure of the Contractor to familiarize themself with all drawings relating to the work and conditions existing at the site of construction will not relieve them of their obligation to furnish all material and labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated work for the consideration set forth in his bid.

The Contractor is cautioned that existing utilities and Owner's water supply infrastructure/equipment at the site are to be kept in operation during the period of the Contract.

The Contractor is alerted to the fact that the Owner assumes no responsibility for actual conditions of the areas affected by work indicated or called for by the Contract Documents.

PART 2: PRODUCTS

Not Used

PART 3: EXECUTION

Not Used

* * * * *

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Removal and disposal of existing roof system materials and related accessory items.

1.3 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.

B. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, otherwise indicated to remain the Owner's property or otherwise specified, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might later be misconstrued as damage caused by the Contractor during the course of the project.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of the building immediately below and adjacent to selective demolition area. Conduct selective demolition so that Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Owner assumes no responsibility for actual condition of buildings to be selectively demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Storage or sale of removed items or materials on-site will not be permitted.

1.8 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials or as otherwise specified.

1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

B. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Engineer.

C. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 PREPARATION

A. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
2. Protect existing site improvements, appurtenances, and landscaping to remain.

3.3 ROOFING REMOVAL

A. Remove only as much roofing as can be replaced with new roofing system, including related flashings, the same day or before the onset of precipitation, whichever is sooner.

B. Promptly remove all removed materials from the roof. Do not overload the structural capacity of the roof deck with excessive debris.

3.4 PATCHING AND REPAIRS

A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

C. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 02070

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Wood blocking and nailers.

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

   1. NeLMA: Northeastern Lumber Manufacturers' Association.
   2. NLGA: National Lumber Grades Authority.
   3. SPIB: The Southern Pine Inspection Bureau.
   4. WCLIB: West Coast Lumber Inspection Bureau.
   5. WWPA: Western Wood Products Association.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

B. Blocking attachments to existing construction shall comply with ANSI/SPRI/FM 4435/ES1, Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.

B. For items of dimension lumber size, provide Construction or No. 2 and the following species:

1. Douglas fir- larch; NLGA.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Power-Driven Fasteners: NES NER-272.

C. Wood Screws: ASME B18.6.1.

D. Lag Bolts: ASME B18.2.1.

E. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06100

SECTION 07015.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Full tear-off of entire roof.
2. Temporary roofing.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

B. Full Roof Tear-Off: Removal of existing roofing system from deck.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1. Include certificate that Installer is approved by warrantor of roofing system.
2. Include certificate that Installer is licensed to perform asbestos abatement.

B. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

C. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: licensed to perform asbestos abatement in the state or jurisdiction where Project is located.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Reroofing Conference: Conduct conference at Project site.

1. Meet with Owner; Engineer; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; roofing Installer, including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing, including installers of roof deck, roof accessories, and roof-mounted equipment.
2. Review methods and procedures related to roofing system tear-off and replacement, including, but not limited to, the following:

    a. Reroofing preparation, including roofing system manufacturer's written instructions.
    b. Temporary protection requirements for existing roofing system components that are to remain.
    c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
    d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
    e. Existing roof deck conditions requiring notification of Engineer.
    f. Existing roof deck removal procedures and Owner notifications.
    g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
    h. Structural loading limitations of roof deck during reroofing.
    i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
    j. HVAC shutdown and sealing of air intakes.
    k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
    l. Asbestos removal and discovery of asbestos-containing materials.
    m. Governing regulations and requirements for insurance and certificates if applicable.
    n. Existing conditions that may require notification of Engineer before proceeding.

1.7 FIELD CONDITIONS

A. Existing Roofing System: See drawings for existing roofing systems.

B. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations are not disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1. Coordinate work activities daily with Owner so Owner can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.

C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

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

E. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

F. Hazardous Materials: It is not expected that hazardous materials such as asbestos-containing materials will be encountered in the Work.
1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

A. Expanded Polystyrene (EPS) Insulation: ASTM C 578.

B. Plywood: DOC PS1, Grade CD Exposure 1.

C. OSB: DOC PS2, Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are Contractor's responsibilities.

B. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet.

C. Glass-Fiber Felts: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt.

D. Asphalt Primer: ASTM D 41/D 41M.

E. Roofing Asphalt: ASTM D 312, Type III or IV.

F. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Global's "Approval Guide."

2.3 INFILL AND REPLACEMENT MATERIALS

A. Wood blocking, curbs, and nailers are specified in Section 06100 "Rough Carpentry."

2.4 AUXILIARY REROOFING MATERIALS

A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

A. Shut off rooftop utilities and service piping before beginning the Work.

B. Test existing roof drains to verify that they are not blocked or restricted. Immediately notify Engineer of any blockages or restrictions.

C. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

D. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

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

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Remove aggregate ballast from roofing.

C. Full Roof Tear-Off: Remove existing roofing and other roofing system components down to the deck.
   1. Remove wood blocking, curbs, and nailers.
   2. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263. Do not proceed with roofing work if moisture condenses under plastic sheet.

C. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Engineer. Do not proceed with installation until directed by Engineer.

D. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Engineer. Do not proceed with installation until directed by Engineer.

3.4 TEMPORARY ROOFING

A. Install approved temporary roofing to protect existing areas during reroofing operations

B. All temporary roofing must be removed prior to the new roofing installation.

3.5 BASE FLASHING REMOVAL

A. Remove existing base flashings. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

3.6 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

   1. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 07015.19

SECTION 07521 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
2. PMMA Liquid applied flashing.
3. Vapor Barrier.
4. Roof insulation.

B. Related Requirements:

1. Section 07620 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
2. Section 07710 “Roof Specialties” for roof edge facias.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Engineer, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
1. Base flashings and membrane terminations.
2. Insulation fastening/ adhesive patterns for corner, perimeter, and field-of-roof locations.

C. RoofNav Data: Provide the “Roofing System Contractor Package and Roof Manufacturer’s System Letter” for verification of wind uplift ratings and component assembly data or a letter from the roofing system manufacturer stating the following:
1. RoofNav assembly numbers.
2. Lists ALL roofing components including but not limited to the membranes, insulation, coverboard, flashing, adhesives, fasteners, fascia/ edge metal and the deck.
3. States that the system and its components listed above meet the following:
   a. Wind speed: 100 MPH Wind Warranty
   b. Modified Bitumen at Concrete Decks: 100 MPH Wind Warranty
      1) Perimeter Uplift Rating: 315 PSF
      2) Corner Uplift Rating: 315 PSF
4. The system meets the required 20 year No Dollar Limit warranty for 100 MPH wind for roof with concrete decks.
5. All edge metal (fascias) will be covered under the roof manufacturer’s total system warranty including the wind speed warranty.
6. Insulation fastening/ adhesive patterns for corner, perimeter, and field-of-roof locations.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

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

1. Submit evidence of complying with performance requirements.

C. Product Test Reports: For components of membrane roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Research/Evaluation Reports: For components of membrane roofing system, from ICC-ES.

E. Field quality-control reports.

F. Sample Warranties: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Warranty: Separate warranty for each building.

B. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is FM Global approved for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.9 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.

1.10 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.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, copings, fascias, expansion joints and other components of roofing system.
2. Warranty Period: **20 years** from date of Substantial Completion, non-prorated and no dollar limit (NDL).
3. Peak Gust Wind Speed: **100 mph** for roof.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as vapor retarder, membrane roofing, base flashing, roof insulation, fasteners, cover boards, and walkway products, for the following warranty period:

1. Warranty Period: five years from date of Substantial Completion.

1.12 TORCH SAFETY PRECAUTIONS

A. General: All torch-applied roofing shall be installed in accordance with recommendations provided in Factory Mutual Property Loss Prevention Data Sheet 1-33, “Safeguarding Torch Applied Roof Installations” and shall comply with the New Jersey State Fire Prevention Code (latest editions)

B. Installation Safeguards

1. Torches used to secure roofing membranes should be used in accordance with manufacturer’s recommendations. The flame from a hand-held torch should be constantly moved from side to side. If a mobile heating apparatus is used, it should be kept in constant motion while operating. To prevent smoldering or ignition of membranes, they should not be overheated.
2. Caution should be used when working around roof openings, penetrations or flashings. Wood nailers, cant strips and metal flashing should not come in direct contact with the flame of the torch. Small torches should be used to heat the underside of the membrane away from these areas before securement. The torch should not be used in areas where the flame impingement cannot be fully viewed. Open flames should not be left unattended. Roof openings/vents should be covered with a stable noncombustible cover to prevent ignition of building components or contents.

a. Extreme caution should be used near penetrations such as exhaust vents to prevent ignition of accumulated flammable discharges. Such accumulations should be cleaned/removed before roofing work begins.
b. Air conditioning units and ventilating fans should be shut down before torch work is done in surrounding areas.
c. Expansion joints should be filled with mineral wool or ceramic fiber with a steel cover plate below.

3. A torch stand should be used to direct the flame upward when momentarily not in use. The cylinder valve should be closed to burn off propane in the line before shutting off the torch head. The gas supply should be shut off whenever a propane odor is detected.
4. Installations should be coordinated with concerned parties, and close supervision should be provided.
5. Torches should not be used near gas lines, electrical wires or flammable liquids during roof construction.
6. The torch flame should not be applied to a combustible substrate when installing the membrane. When foam plastic, kraft-faced glass fiber, wood fiber insulation or cant strips, or plastic fastener plates are to be used, they should be covered with a minimum 40 lb. Organic felt base sheet or a glass fiber base sheet before the torch applied membrane is installed. Torch flames should not come in contact with exposed plastic roofing cement.
7. The operator of the torch shall remain on the premises to perform fire watch for a minimum of one (1) hour after the torch is utilized. All roof areas worked on should be checked for “hot spots” and signs of smoldering. The inside of the building should also be inspected for signs of fire or smoke. All “hot spots” or fires, even if extinguished, should be reported to the fire department.

C. Equipment Safeguards

1. Proper equipment should be used to heat roofing membranes. Torches should be equipped with a pilot adjustment, flame height adjustment, 25 to 50 feet approved or listed hose, pressure gauge and regulator. A spark ignitor should be used. Torch trolleys and multiple torch head machines should be equipped with listed safety valves.
   a. Safety caps should be tied to all propane cylinders and installed on the valve whenever cylinders are not in use. Carts used to transport cylinders should be stable. Tall, narrow, standing cylinders should be chained against walls or in proper carts.
2. The propane cylinder should be adequately sized for the torch used. If frost buildup occurs on propane cylinders and the rate of vapor withdrawal is no longer adequate for operating conditions, the cylinder should not be placed on its side or heated with the torch flame. The hose should be disconnected and a larger cylinder used. Liquid propane cylinders may be of either the vapor withdrawal or liquid withdrawal type.
   a. Liquid withdrawal cylinders are preferred due to frost buildup associated with vapor withdrawal cylinders. However, when vapor withdrawal cylinders are used, or if temperatures are below 20 degrees F, 40 or 100 lb. cylinders should be used with larger torches (such as those used on the field of the roof).
3. Equipment should be thoroughly inspected and repaired as needed. Propane cylinders should be inspected for dents. If dents larger than 1” in diameter are

found, the cylinder should be replaced. Torch and cylinder connectors should be visually inspected and checked for leaks with a soap and water solution. An open flame should not be used to test for leaks.

a. Leaky equipment should not be used. Regulator adjustments and pressure gauges should be checked to assure they are operable. The vent on the regulator should be checked to ensure it is not blocked. If an unstable flame occurs (one which roars loudly and tends to blow itself out), the equipment should be repaired or replaced immediately.

4. A Fire watch of all equipment utilized for the torching application should be conducted for at least one (1) hour after torch work has been completed.

D. Fire Extinguishing Equipment

1. The Contractor shall provide, on the roof, at least one (1) portable fire extinguisher with a minimum 4-A rating, two (2) portable fire extinguishers with a minimum 2-A rating each, or a water hose connected to a water supply at the building where the torching is being done. In addition, there should be at least one 10-lb. multipurpose dry chemical portable extinguisher within 20 feet horizontal travel distance of torch-applied roofing equipment.

E. Fuel Handling Safeguards

1. Fuel containers, burners and related appurtenances of roofing equipment in which liquefied petroleum gas is used for heating should comply with Factory Mutual Data Sheet 7-50; “Compressed Gases in Cylinders” and NFPA 58; “Standard for the Storage and Handling of Liquefied Petroleum Gases”.
   a. All fuel containers should be located at least 10 feet from the burner flame or at least 2 feet away when properly insulated from heat of flame.
   b. Storage of LPG cylinders or containers on rooftops is prohibited. All LPG cylinders or containers shall be removed from the rooftop and placed in a secure area, protected against tampering, at the end of each work shift.
   c. Propane cylinders should not be hoisted by their valves. Straps placed around the cylinders should be utilized.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide

Siplast, Inc. Roof Nav No. 160449-49236-0 or comparable products by one of the following:

1. Tremco Incorporated.
2. Soprema.

B. Source Limitations: Obtain components including roof insulation, fasteners, coverboard, edge metal for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed 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. Roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

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

C. Roofing System Design: Tested by a qualified testing agency to meet the requirements of ANSI/SPRI ES-1 and resist the following uplift pressures:
1. Modified Bitumen over Concrete Decks:
   a. Corner Uplift Pressure: 315 lbf/sq. ft.
   b. Perimeter Uplift Pressure: 315 lbf/sq. ft.

D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 ROOFING SHEET MATERIALS

A. Roofing Membrane Base Sheet and Stripping Ply: ASTM D 5147, SBS-modified asphalt sheet (reinforced with glass fibers); smooth surfaced; suitable for application method specified.

1. Thickness: 114 mil minimum.
2. Maximum 35% filler content.
3. Basis of Design: Paradiene 20 EG by Siplast.

B. Granule-Surfaced Roofing Cap Sheet: ASTM D 5147 SBS-modified asphalt sheet (reinforced with a combination of polyester fabric and glass fibers); granule surfaced; suitable for application method specified, and as follows:

1. Thickness: 130 mil minimum.

2. Granule Color: White.
3. Maximum 35% filler content.
4. Basis of Design: Paradiene 30 FR by Siplast.

2.4 BASE FLASHING SHEET MATERIALS

A. Backer Sheet: ASTM D 5147 SBS-modified asphalt sheet (reinforced with glass fibers); smooth surfaced; suitable for application method specified.

1. Thickness: 114 mil minimum.
2. Maximum 35% filler content.
3. Basis of Design: Paradiene 20 by Siplast.

B. Modified Bitumen Flashing Cap Ply: Foil-laminate-surface modified asphalt sheet, consisting of a reinforcing mat impregnated and coated with Styrene-Butadiene-Styrene (SBS) modified bitumen, with back surface of the sheet coated with a modified asphalt adhesive layer, formulated for torch application. A low softening point asphalt shall be incorporated into the membrane between channel-embossed metal-foil surfacing and the SBS modified bitumen membrane, at the channels, in order to preclude foil delamination during daily thermal cycling.

1. Basis of Design: Veral Aluminum by Siplast.

2.5 FLUID APPLIED FLASHING SYSTEM

A. A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed polymethyl methacrylate (PMMA) primer, basecoat and topcoat, combined with a non-woven polyester fleece. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

1. Basis of Design: Parapro PMMA Flashing System by Siplast.

2.6 VAPOR RETARDER

A. Torch Grade Modified Bitumen: ASTM D 5147, SBS-modified asphalt sheet (reinforced with glass fibers); smooth surfaced; suitable for application method specified.

1. Thickness: 110 mil minimum.
2. Maximum 35% filler content.
3. Basis of Design: Paradiene 20 TG by Siplast.

B. Self-Adhered Modified Bitumen Base Flashing: ASTM D 5147, SBS-modified asphalt sheet (reinforced with glass fibers); smooth surfaced; suitable for application method specified.

1. Thickness: 98 mil minimum.
2. Maximum 35% filler content.
3. Basis of Design: Paradiene 20 SA P by Siplast.

2.7 AUXILIARY ROOFING MATERIALS

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

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content:

    a. Plastic Foam Adhesives: 50 g/L.
    b. Gypsum Board and Panel Adhesives: 50 g/L.
    c. Multipurpose Construction Adhesives: 70 g/L.
    d. Fiberglass Adhesives: 80 g/L.
    e. Contact Adhesives: 80 g/L.
    f. Other Adhesives: 250 g/L.
    g. Nonmembrane Roof Sealants: 300 g/L.
    h. Sealant Primers for Nonporous Substrates: 250 g/L.
    i. Sealant Primers for Porous Substrates: 775 g/L.

B. Asphalt Primer: ASTM D 41/D 41M.
1. Basis of Design: PA-917 LS Primer by Siplast.

C. Cold-Applied Adhesive: Roofing system manufacturer's non-toxic, odorless, one part, asbestos-free, solvent free, modified asphalt adhesive specially formulated for compatibility and use with roofing membrane.
1. Basis of Design: PA-311 R by Siplast.

D. Asphalt Roofing Cement: Roofing system manufacturer's non-toxic, odorless, one part, asbestos-free, solvent free adhesive.
1. Basis of Design: SFT Cement by Siplast.

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

G. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match roofing.

H. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

I. PMMA Resin Paste: Multi-component, fast curing, PMMA resin paste used for remediation of depressions or surface irregularities in the substrate.
   1. Basis of Design: Pro Paste by Siplast.

2.8 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following: (Insulation must be accepted by the roof system manufacturer.)
      a. Siplast, Inc. (Basis of Design Paratherm G Polyiso Insulation.)

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

D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.9 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
   1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
   2. Basis of Design: Parafast Insulation Adhesive by Siplast.

D. Insulation Cant Strips: ASTM C 728, perlite insulation board.

E. Wood Nailer Strips: Comply with requirements in Section 06100 "Rough Carpentry."

F. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed. (Must be listed in the Roof Nav assembly.)

1. Basis of Design: Dens Deck Prime by Georgia-Pacific.

2.10 WALKWAYS

A. Walkway Pads: Reinforced asphaltic composition pads with slip-resisting mineral-granule surface, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 3/8 inch thick, minimum.

1. Pad Size: 30” X 30” (30” wide roll cut to pads.)
2. Basis of Design: Paratread by Siplast.

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and 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. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

B. 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. Comply with roofing system manufacturer's written instructions.

3.4 VAPOR-RETARDER INSTALLATION

A. Beginning at the low point of the roof, fully torch adhere vapor barrier membrane in a single layer over primed concrete deck, side and end lapping each sheet a minimum of 3 inches, with end laps staggered.

B. Install one ply of modified bitumen base flashing at all vapor barrier perimeters and penetrations. Install material as recommended by manufacturer, using recommended methods, at wood substrate locations.

C. Completely seal vapor barrier membrane base flashing at terminations, obstructions, and penetrations with three course cement/fabric/cement flashing.

D. Cover all vertical walls, curbs, etc. as indicated on the drawings, with self adhering modified bitumen waterproofing.

3.5 INSULATION INSTALLATION

A. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing system with vertical surfaces or angle changes greater than 45 degrees.

B. 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 with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

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

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

E. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft., and allow primer to dry.
2. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

F. 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 in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing system manufacturer.
1. Adhere cover boards to resist uplift pressure at corners, perimeter, and field of roof.

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

3.6 ROOFING INSTALLATION, GENERAL

A. Concrete Deck: Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:

1. Deck Type: C (concrete or nonnailable).

2. Adhering Method: L (cold-applied adhesive except vapor barrier).

3. Retain "Base Sheet" Subparagraph below if required. NRCA's modified bitumen roof assemblies require a base sheet, except for those assemblies using two SBS-modified asphalt sheets over cover board applied over insulation.

4. Base Sheet: One.

5. NRCA's modified bitumen roof assemblies that do not use two modified bitumen plies, and some that do, require at least one glass-fiber base-ply sheet. Hybrid systems use two or more glass-fiber base-ply sheets.

6. Number of SBS-Modified Asphalt Sheets: One.

7. Surfacing Type: M (mineral-granule-surfaced cap sheet).

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

C. Coordinate installation of roofing system so insulation and other components of the 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 sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.

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

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

3.7 BASE-SHEET INSTALLATION

A. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:
1. Adhere to substrate in a uniform coating of cold-applied adhesive.

3.8 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing sheet 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. Adhere to substrate in cold-applied adhesive.
   2. Unroll roofing sheets and allow them to relax for minimum time period required by manufacturer.

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

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

C. Install roofing sheets so side and end laps shed water.

3.9 FLASHING AND STRIPPING INSTALLATION

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

   1. Prime substrates with asphalt primer if required by roofing system manufacturer.
   2. Backer-Sheet Application: Mechanically fasten backer sheet to walls or parapets. Adhere backer sheet over roofing membrane at cants in cold-applied adhesive.
   3. Flashing-Sheet Application: Adhere flashing sheet to substrate in asphalt roofing cement at rate required by roofing system manufacturer.

B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 8 inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

   1. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.

3.10 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

   1. Notify Engineer and Owner 48 hours in advance of date and time of inspection.

B. Roofing system will be considered defective if it does not pass tests and inspections.

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

3.11 PROTECTING AND CLEANING

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

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

3.12 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: NEW JERSEY WATER SUPPLY AUTHORITY
2. Address: 1851 STATE ROUTE 31, CLINTON, NJ 08809
3. Building Name/Type: WHITEHOUSE RELEASE STRUCTURE
4. Address: 21 RAILROAD AVE, WHITEHOUSE STATION, NEW JERSEY 08889
5. Area of Work: Roof indicated.
6. Acceptance Date: _____.
7. Contractor’s Warranty Period: 5 Year NDL.
8. Expiration Date: _____.
9. Manufacturer’s Warranty Period: 20 Year NDL.
10. Expiration Date: _____.

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. peak gust wind speed exceeding **100 mph**.
   b. fire;
   c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   d. faulty construction of existing or by others parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
   e. vapor condensation on bottom of roofing; and
   f. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
8. The contractor shall perform all emergency repairs to all defects or leaks in the roofing system within four (4) hours of receipt of notice from the owner. Repairs

shall include all labor and material. When weather permits, all temporary repairs shall be redone and the roof restored to the standard of the original installation.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

END OF SECTION 07521

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Formed low-slope roof sheet metal fabrications.

B. Related Requirements:

1. Section 06100 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 07720 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.

5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of roof-penetration flashing.
8. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashing as applicable.
9. Include details of special conditions.
10. Include details of connections to adjoining work.
11. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Color: As selected by Owner from manufacturer's full range.
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

C. Stainless-Steel Sheet: ASTM A 240/A 240M Type 304, dead soft, fully annealed; with smooth, flat surface.

1. Finish: 2D (dull, cold rolled).

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

C. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

D. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

H. Do not use graphite pencils to mark metal surfaces.

2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Counterflashing: Fabricate from the following materials:

1. Stainless Steel: 0.019 inch thick.

B. Roof-Penetration Rain Collar:

1. Stainless Steel: 0.019 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
4. Torch cutting of sheet metal flashing and trim is not permitted.

5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of interlocking folded seam unless otherwise indicated.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.6 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.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620

SECTION 07710 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Roof-edge flashings

B. Related Sections:

   1. Section 06100 "Rough Carpentry " for wood nailers, curbs, and blocking.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

A. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:

   1. Design Pressure: 315 PSF.

   2. Wind Speed: 100 MPH.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work. Include the following:

1. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
2. Pattern of seams and layout of fasteners, cleats, clips, and other attachments.
3. Details of termination points and assemblies, including fixed points.
4. Details of special conditions.

C. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

D. Samples for Verification: For copings made from 12-inch lengths of full-size components including fasteners, cover joints, accessories, and attachments.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for copings.

B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Engineer, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects roof specialties including installers of roofing materials and accessories.
2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof specialties installation.

1.9 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Warranty: Roof manufacturer agrees to repair or replace components of the coping and fascia system that fail in materials or workmanship within specified warranty period. See section 07521 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing " for roofing warranty.

C. Warranty Requirements: Provide all manufacturer and installer warranties required by Sections 07015.19 Preparation for Reroofing, 07521 SBS Modified Bituminous Membrane Roofing, 07620 Sheet Metal Flashing and Trim, 07710 Roof Specialties, and 07920 Joint Sealants. Warranty coverage, terms, and duration shall be as specified in the referenced Sections. Submit warranty documentation in a form acceptable to the Owner upon completion of the Work.

PART 2 - PRODUCTS

2.1 EXPOSED METALS

A. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

1. Surface: Smooth, flat finish.
2. Exposed Coil-Coated Finishes: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Two-Coat Fluoropolymer: AAMA 620. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
b. Concealed Surface: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.2 CONCEALED METALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.

B. Aluminum Sheet: ASTM B 209, alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.

C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.

D. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Exposed Penetrating Fasteners: There shall be no exposed fasteners.
2. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 ROOF-EDGE FLASHINGS

A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous formed-

or extruded-aluminum anchor bar with integral drip-edge cleat to engage fascia cover. Provide matching corner units.

1. Basis-of-Design Product: Subject to compliance with requirements, provide the following: (The fascia system must be factory fabricated - not shop fabricated and must be approved by the roofing system manufacturer and covered under the roofing system total system warranty.)

    a. Siplast Extruded Paragard TE Fascia – by Siplast. (For Siplast Roofing System.)

2. Fascia Cover: Fabricated from the following exposed metal:

    a. Formed Aluminum: 0.050 inch thick.

3. Corners: Factory mitered and continuously welded.
4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
5. Continuous Cleat: Fabricated from the following exposed metal:
    a. Extruded aluminum anchor bar: 0.070 inch thick.

B. Manufacturers offer a variety of special fabrications and fascia-cover profiles.

C. Aluminum Finish: Metallic Fluoropolymer: AAMA 620. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color: Custom Color as selected by Owner.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

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

3.2 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise shown on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood blocking not less than 3/4 inch for wood screws.

E. Seal joints with elastomeric sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.3 ROOF-EDGE FLASHING INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.4 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. 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.

C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07710

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sealants not specified elsewhere for the following applications, including those specified by reference to this section:

1. Exterior joints in the following vertical surfaces and non-traffic horizontal surfaces.

B. Related Sections include the following:

1. Section 07620; Sheet Metal Flashing and Trim: containing requirements for sheet metal components incorporating sealant for weatherproof protection.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated

B. Samples for Initial Selection: Manufacturer’s color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.5 QUALITY ASSURANCE

A. Installer Qualification: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 WARRANTY

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

1. Special Installer's Guarantee: All work under this Section shall be guaranteed under the Contractor's Guarantee for a period of two (2) years.

B. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified in the sealant schedules at the end of Part 3.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by owner or engineer from manufacturer's full range for this characteristic.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

B. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

C. Stain-Test-Response Characteristics: Where elastomeric sealants are specified in the Elastomeric Joint-Sealant Schedule to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.4 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.

3. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 ELASTOMERIC JOINT-SEALANT SCHEDULE

A. Multicomponent Nonsag Urethane Sealant: Provide products complying with the following for applications indicated:

1. Products: Provide one of the following:

    a. NP 2; Sonneborn Building Products Div., Cherx Inc.
    b. Dynatrol II; Pecora Corporation.
    c. Dymeric 511; Tremco.
    d. Or approved equal.

2. Type and Grade: M (Multicomponent) and NS (nopnsag).
3. Class: 25.
4. Addional Movement Capability: 50 percent movement in extension and 50 percent compression for a total of 100 percent movement.
5. Use Related to Exposure: NT (nontraffic).

6. Other sealant joints indicated on the drawings, except membrane/membrane flashing edge sealants included in Section 07521

END OF SECTION 07920