BOOK 2 OF 2
TECHNICAL SPECIFICATIONS
FOR
EARLY CHILDHOOD DEVELOPMENT CENTER ROOF REPLACEMENT
FOR
TEXAS A&M UNIVERSITY CORPUS CHRISTI

PROJECT NUMBER: 1520057
CSP NUMBER CSP1-0002

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SECTION 01 21 13
CONTINGENCY ALLOWANCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: To provide adequate budget and bonding to cover items not precisely determined prior to bidding, allow within the proposed Contract Sum the amounts described below.

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, Uniform General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
   2. Other provisions concerning Contingency Allowances also may be stated in other Sections of these Specifications.

C. All work to be performed from any contingency fund must be approved in writing from Owner/Project Manager prior to work commencing.

1.02 SPECIFIC CASH ALLOWANCES

A. Allow the sum of $70,000.00 for General Contingency, as dictated by the Consultant and Owner.

END OF SECTION 01 21 13
SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.

1.03 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph or videotape. Indicate elevation or story of construction. Include same label information as corresponding set of photographs or videotape.

PART 2 - PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in uncompressed JPEG or TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels.

PART 3 - EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in filename for each image.
   2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect and Owner.
C. Preconstruction Photographs: Before starting construction, take digital photographs of project site, exterior elevations, interior spaces and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect and Construction Manager.

1. Take a minimum of eight (8) photographs to show existing conditions adjacent to property before starting the Work.

2. Take a minimum of eight (8) photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

3. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, sidewalks, drives, landscaping and improvements.

END OF SECTION 01 32 33
PART 1 - GENERAL

1.01 DESCRIPTION

A. Work includes: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

1.02 QUALITY ASSURANCE

A. Coordination of submittals:
   1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
   2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
   3. By affixing the Contractor’s signature to each submittal, certify that this coordination has been performed.

B. Substitutions
   1. The contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when listed at time of bidding, on the form provided in the bidding documents, and when substantiated by the Contractor’s submittal of required data.
   2. The following products do not require further approval except for interface within the work:
      a. Products specified by reference to standard specifications such as ASTM and similar standards.
      b. Products specified by manufacturer’s name and catalog model number.
   3. Where any material is specified by proprietary name, trade name, name of manufacturer, generic name, or catalog number with the addition of such expressions as "or equal"/"or approved equal", it is understood that the material named is intended and no substitution will be allowed without written approval by the Owner’s representative ten (10) calendar days prior to proposal due date.
   4. Should a specified material not be available, a substitution shall require approval (in writing) of the Owner's representative and the roof system manufacturer issuing the warranty before being utilized on this project.
   5. Unless otherwise indicated, the materials to be used in this specification are those specified and denote the type, quality, performance, etc. required. All proposals shall be based upon the use of specified material.
   6. Do not substitute materials, equipment, or methods unless substitution has been specifically approved in writing for this work by the Architect/Consultant/Project Manager.
C. "Or equal"

1. Where the phrase "or equal", or "or equal as approved by the Architect/Consultant/Project Manager", occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this work by the Architect/Consultant/Project Manager.

2. A Contractor who proposes to quote on the basis of an "or equal"/"or approved equal" alternate material or system shall submit to the Owner's representative the following information, at least ten (10) calendar days prior to scheduled proposal opening. Only one request for substitution will be considered for each material or system. When substitution is not accepted, specified product or system shall be used.
   a) A five (5) gallon sample of any adhesive, coating, mastic, or sealant and a three foot by five foot (3' x 5') sample of any sheeting or rolled goods as may be specified.
   b) A certificate from an accredited testing laboratory comparing the physical and performance attributes of the proposed material with those of the specified materials.
   c) A list of at least three (3) local jobs where the proposed alternate material was used under similar conditions and written documentation showing successful installation in the United States of similar size and scope for a minimum of ten (10) years. These jobs must be available for inspection by the Owner's representative.
   d) In the event a substitution is acceptable by the Owner, all contractors shall be notified of the acceptable alternate prior to proposal opening.
   e) During the course of work, the Owner's representative may secure from the containers at the job site, samples of the materials being used and submit the samples to an independent testing laboratory for comparison. If the results of the independent testing laboratory prove that the materials are not comparable and equal to the specified materials, the Contractor shall pay for the testing and the Owner reserves the right to reduce the amount of the proposal by twenty percent (20%) if all work has already been completed before the test results become known. If the contract work is not completed when the test results become known, the Owner shall impose a penalty in proportion to the amount of work already completed, and all remaining work shall be completed with the specified materials.

D. Procedure for Use of Substitution Request Form

1. Substitution request including all required documentation must be delivered to the Owner’s Representative’s office no later than the date indicated in the specifications. Requests submitted late will not be considered.

2. The Individual or Firm requesting a substitution must document that the requested substitution is equal or superior to the specified product. Failure to provide clear, accurate, and adequate documentation will be grounds for rejection.

3. Required documentation shall consist of applicable information which would aid the Architect/Consultant in making an informed decision. Include side by side product comparisons, technical data, laboratory test results, product drawings, etc.
4. If use of the proposed product would result in changes to the design of the building, the submittal shall describe fully the changes required to the drawings or specifications. Any cost differences resulting from modifications to the drawings and specifications and the cost of making the changes shall be borne by the Product Supplier.

5. No product will be considered "as equal" to the product specified until it has been included as an allowable substitution, in a written Addendum to the project.

1.03 SUBMITTALS

A. Make submittals of Shop drawings, samples, Substitution Requests, and other items in accordance with the provisions of this section.

B. Upon receipt of Notice of Acceptance of this proposal, the Contractor shall submit the following items. All submittals shall be submitted to the Owner/Owner's representative within ten (10) calendar days of the date on the Notice of Acceptance and prior to the award of contract.

1. Contractor's executed insurance certificate.
2. Material manufacturer's approval/acceptance of the specifications and details as written or noted for this project, fastener pattern layout, insulation, fasteners and all related materials.
3. Contractor's executed payment and performance bonds as required.
4. Shop drawings of all perimeter and projection details, and sheet metal details approved by manufacturer, for Owner's approval if proposed details differ from those included with this proposal package. These drawings shall be approved by the membrane manufacturer and submitted at the preconstruction conference for Owner review and approval prior to work start.
5. Approved applicator must submit a roof drawing which will be employed in the project if proposed drawing differs from that included with this proposal package.
6. Detailed project sequencing, staging, material loading, manpower plans, and detailed project construction schedule for approval.
7. Copy of warranty application that has been sent to manufacturer.
8. Sample of warranty that is to be issued upon project completion.
9. Submit list of all mechanical, electrical, rigging, sheet metal, and other Subcontractors with evidence of Subcontractor's insurance coverage in compliance with contract requirements.
10. Project superintendent's resume and project experience list for proposed system.
11. Contractor shall submit written statement that their company or any Subcontractor they may use is not employing workers classified as undocumented workers on this project.
12. Samples of all materials not supplied or prior approved by the roofing membrane manufacturer shall be submitted to the manufacturer for written approval prior to installation start.
13. Submit all product data, including detailed test results of material applied to surfaces similar to requirements of this Section. Submit manufacturer's instructions for methods and application procedures.

C. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.

1. Samples of all roofing system components including all specified accessories.
2. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.

3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.

4. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.

5. Manufacturer's Equiviscous Temperatures (EVT) for the specified bitumens.

6. Submit shop drawings, product data and mockups of all sheet metal.

D. Samples and Manufacturer's Submittals for Sheet Metal and Miscellaneous Accessories: Submit prior to deliver or installation.

1. Submit shop drawings, product data and mockups of all sheet metal fabrications.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS

A. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the work.

B. Shop Drawings: Provide manufacturer's approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings.

C. Shop Drawings and Product Data:

1. Manufacturer's Details: All termination details and other details normally required by the membrane manufacturer's Technical Specifications, including both standard details and special details, shall be furnished by the Contractor and shall be approved in writing by the manufacturer, the company project manager, and the Owner's representative prior to final installation. Submittals shall be submitted in digital .pdf format.

2. As-built Drawings: Contractor shall supply the Owner with a full set of "as-built" drawings depicting location, size, nomenclature and manufacturer of all replaced roof slabs. One set of reproducible drawings, twenty-four inches by thirty-six inches (24" x 36"), shall be supplied along with two sets of copies and digital .pdf format. Contractor shall also supply Owner with "as-built" roofing details as approved by the appropriate manufacturer with original manufacturer’s seals and signatures thereon. Owner must have "as-built" drawings in hand prior to release of final payment to the Contractor.

3. Initially submit three prints of each drawing, including fabrication, erection, layout and setting drawings, and other such drawings as required under various sections of the specifications until final approval is obtained.

4. Date and mark shop drawings to show name of project, Owner, Contractor, origination Subcontractor, manufacturer or supplier, and separate details as pertinent.

5. Shop drawings shall completely identify specification sections and locations at which materials or equipment are to be installed.
6. Minimum drawing size shall be eight and one-half inches by eleven inches
   (8-1/2" x 11").
7. Submit sufficient copies of manufacturer’s descriptive data including catalog sheets
   for materials, equipment and fixtures, showing dimensions, performance
   characteristics and capacities, diagrams and controls, schedules, and other pertinent
   information required.
8. Submit brochures and other submittal data that cannot be reproduced economically,
   in such quantities to allow the Owner to retain one copy of each after review. Mark
   product data to show the name of project, Owner, Contractor, originating
   Subcontractor, manufacturer or supplier, and separate details if pertinent.
9. Product data shall completely identify specification sections and locations at which
   materials or equipment are to be installed.
10. Accompany each submittal with a separate transmittal letter in duplicate, containing
    date, project title and number, Contractor’s name and address, number of each shop
    drawing, product data and samples submitted, and notification of deviations from
    Contract Documents.
11. One (1) set of prints and will be returned to the Owner for record. The cost of all
    printing is the responsibility of the Contractor.

D. Provide manufacturer’s approved details, or all perimeter conditions, project conditions,
   and any additional special job conditions which require details other than indicated in the
   drawings.

E. Types of prints required: Submit Shop Drawings in the form of digital .pdf files and tabbed
   for each specification section. Each specification section shall be one .pdf file. Multiple
   files of one section will not be accepted.

F. Review comments of the Architect/Consultant/Project Manager will be shown on the
   copies when it is returned to the Contractor. The Contractor may make and distribute
   marked copies as required for his purposes.

G. Fax submittals are not acceptable.

2.02 MANUFACTURER’S LITERATURE

A. Where contents of submitted literature from manufacturers includes data not
   pertinent to the submittal, clearly show which portions of the contents is being
   submitted for review.

2.03 MAINTENANCE PROCEDURES

A. Maintenance Procedures: Within ten days of the date of Substantial Completion of the
   project, deliver to the Owner three copies of the manufacturer’s printed instructions
   regarding care and maintenance of the roof.

2.04 SAMPLES

A. Provide sample or samples identical to the precise article proposed to be provided.
   Identify as described under “Identification of Submittals” below.
B. Number of samples required:
1. Unless otherwise specified, submit samples in the quantity which is required to be returned, plus one which will be retained by the Architect/Consultant/Project Manager.
2. By pre-arrangement in specific cases, a single sample may be submitted for review and, when approved, be installed in the work at a location agreed upon by the Architect/Consultant/Project Manager.

2.05 COLORS AND PATTERNS

A. Unless the precise color and pattern are specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect/Consultant/Project Manager for selection.

B. Contractor shall hold ALL color samples until all items requiring color selections are received. Only then should the actual color samples be submitted for selections. Each sample shall be properly labeled with the name of the project, contractor, manufacturer, and date of submission. Incomplete color submittal will be returned to the Contractor.

C. The Contractor shall allow four weeks after all colors are submitted for final Owner approval.

PART 3 - EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
   1. When material is re-submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
   2. On re-submittals, cite the original submittal number for reference.

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

D. Maintain an accurate submittal log for the duration of the work, showing current status of all submittals at all times. Make the submittal log available to the Architect/Consultant/Project Manager for his review upon request.

3.02 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery.
B. Revisions:

1. Make revisions required by the Architect/Consultant/Project Manager.
2. If the Contractor considers any required revision to be a change, he shall so notify the Architect/Consultant/Project Manager.
3. Make only those revisions directed or approved by the Architect/Consultant/Project Manager.
CSI Form 1.5C

SUBSTITUTION REQUEST
(During the Bid Period)

Project: ___________________________  Substitution Request Number: ___________________________

To: _______________________________  Date: _______________________________

Re: _______________________________  A/E Project Number: _______________________________

Specification Title: ___________________________  Description: ___________________________

Section: ____________  Page: ____________  Article/Paragraph: ___________________________

Proposed Substitution: ___________________________

Manufacturer: ___________________________  Address: ___________________________

Trade Name: ___________________________  Phone: ___________________________

Model No.: ___________________________

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

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

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: ___________________________
Signed by: ___________________________

Firm: ___________________________
Address: ___________________________
Telephone: ___________________________

A/E’s REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: ___________________________  Date: ___________________________

Supporting Data Attached:  ☐ Drawings  ☐ Product Data  ☐ Samples  ☐ Tests  ☐ Reports
END OF SECTION 01 33 00
PART 1 - GENERAL

1.01 SUMMARY

A. This section specifies administrative and procedural requirements for project closeout, including but not limited to:
   1. Observation procedures
   2. Project record document submittal
   3. Operating and maintenance manual submittal
   4. Submittal of warranties
   5. Final cleaning

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting observation for certification of Substantial Completion, complete the following. List exceptions in the request.
   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show one hundred percent (100%) completion for the portion of the work claimed as substantially complete. Include supporting documents for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
   2. If one hundred percent (100%) completion cannot be shown, include a list of incomplete items, the value of incomplete construction and reasons the work is not complete.
   3. Advise Owner of pending insurance change-over requirements.
   4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
   5. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
   6. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey and similar final record information.
   7. Deliver tools, spare parts, extra materials and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable. Extra materials include but are not necessarily limited to those listed in the "Summary of Extra Materials" following this section.
   8. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
   9. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups and similar elements.
B. Observation Procedures: On receipt of a request for observation, the Architect/Project Manager/Consultant will either proceed with observation or advise the Contractor of unfilled requirements. The Architect/Project Manager/Consultant will prepare the Certificate of Substantial Completion following observation, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect/Project Manager/Consultant will repeat observation when requested, and be assured by the Contractor in writing, that the work has been substantially completed.

2. Results of the completed observation will form the basis of requirements for final acceptance.

1.03 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final observation for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Architect/Project Manager/Consultant final observation list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect/Project Manager/Consultant.

4. Submit consent of surety to final payment.

5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

6. Complete final clean up requirements, including touchup painting. Touchup and otherwise repair and restore marred exposed finishes.

B. Re-observation Procedure: The Architect/Project Manager/Consultant will re-observe the work upon receipt of notice that the work, including observation list items from earlier observations, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect/Project Manager/Consultant.

1. Upon completion of re-observation, the Architect/Project Manager/Consultant will prepare a certificate of final acceptance or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, re-observation will be repeated.

3. Should the Architect/Project Manager/Consultant perform re-observations, due to failure of the work to comply with the claims of status of completion made by the Contractor, the Owner shall compensate the Architect/Project Manager/Consultant for additional services; and the Owner shall deduct the amount of the compensation from the final payment to the Contractor.
1.04 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect/Project Manager/Consultant’s reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of black line white-prints of Contract Drawings and Shop Drawings in hard copy or in digital format. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with colored erasable pencil and use other colors to distinguish between variations in separate categories of the work. Use the following color code:
   a) Red for Architectural work
   b) Blue for Structural work
   c) Green for Plumbing work
   d) Orange for HVAC work
   e) Brown for Electrical work
   f) Black for other written notations

2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of the work, submit record Specifications to the Architect/Project Manager/Consultant for the Owner’s records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in the actual work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer’s installation instructions and recommendations. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit complete set of record Product Data to the Architect/Project Manager/Consultant for the Owner’s records.
E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect/Project Manager/Consultant and the Owner’s personnel to determine which of the submitted Samples that have been maintained during progress of the work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner’s Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect/Project Manager/Consultant for the Owner’s records.

G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty two inch (2”), three-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions
2. Spare parts list
3. Copies of warranties
4. Wiring diagrams
5. Recommended "turn around" cycles
6. Observation procedures
7. Shop Drawings and Product Data
8. Fixture lamping schedule

PART 2 - PRODUCTS

2.01 CLEANING AGENTS

A. Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner’s personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer’s representatives. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
3.02 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in "Temporary Facilities" section.

B. Cleaning: Employ experienced cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer’s instructions.

1. Complete the following cleaning operations before requesting Certification of Substantial Completion.
2. Remove labels that are not permanent labels.
3. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
4. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
5. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
6. Clean the site, including landscape development areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials to the Owner’s property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated work have become the Owner’s property, arrange for disposition of these materials as directed.

END OF SECTION 01 77 00
SECTION 06 10 53
MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Rooftop equipment bases and support curbs.
   2. Wood blocking, cants, and nailers.
   3. Sheathing.

1.02 DEFINITIONS

A. 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 - Southern Pine Inspection Bureau.
   4. WCLIB - West Coast Lumber Inspection Bureau.
   5. WWPA - Western Wood Products Association.

1.03 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer’s written instructions for handling, storing, installing, and finishing treated material.
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.
   3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
   1. Preservative-treated wood.
   2. Fire-retardant-treated wood.
   3. Expansion anchors.
   4. Metal framing anchors.
1.04 QUALITY ASSURANCE

A. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria":
   1. Dimension lumber.
   2. Miscellaneous lumber.
   3. Plywood.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.01 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
   3. 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.
   4. Provide dressed lumber, S4S, unless otherwise indicated.
   5. Provide dry lumber with nineteen percent (19%) maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

B. Wood Structural Panels:
   1. Plywood
   2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
   4. Factory mark panels according to indicated standard.

2.02 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) / AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
   1. Preservative Chemicals: Acceptable to authorities having jurisdiction and one of the following:
      a) Chromated copper arsenate (CCA).
      b) Ammoniacal copper zinc arsenate (ACZA).
c) Ammoniacal, or amine, copper quat (ACQ).
d) Copper bis (dimethylthiocarbamate) (CDDC).
e) Ammoniacal copper citrate (CC).
f) Copper azole, Type A (CBA-A).
g) Oxine copper (copper-8-quinolinolate) in a light petroleum solvent.

2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry material after treatment to a maximum moisture content of nineteen percent (19%) for lumber or fifteen percent (15%) for plywood. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:
1. Wood framing members less than eighteen inches (18") above grade.
2. Wood floor plates that are installed over concrete slabs directly in contact with earth.

2.03 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWPA C20 (lumber) or AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664 for lumber or ASTM D 5516 for plywood.
2. Use treatment that does not promote corrosion of metal fasteners.
3. Use Exterior type for exterior locations and where indicated.
4. Use Interior Type A High Temperature (HT), unless otherwise indicated.

B. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

C. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.04 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of the following species:
1. Mixed southern pine; SPIB.
2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; NELMA.
5. Northern species; NLGA.
6. Western woods; WCLIB or WWPA.

C. Other Framing: Construction, Stud, or No. 2 grade and any of the following species:
1. Douglas fir-larch; WCLIB or WWPA.
2. Douglas fir-south; WWPA.
3. Douglas fir-larch (north); NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Hem-fir (north); NLGA.
6. Southern pine; SPIB.
7. Mixed southern pine; SPIB.
8. Spruce-pine-fir (south); NELMA, WCLIB, or WWPA.
9. Spruce-pine-fir; NLGA.

2.05 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including the following:
1. Rooftop equipment bases and support curbs.
2. Blocking.
3. Cants.
5. Furring.

B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with fifteen percent (15%) maximum moisture content and any of the following species:
1. Mixed southern pine; SPIB.
2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; NELMA.
5. Northern species; NLGA.
6. Western woods; WCLIB or WWPA.

C. For exposed boards, provide lumber with fifteen percent (15%) maximum moisture content and any of the following species and grades:
1. Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine Premium or 2 Common (Sterling) grade; NELMA, NLGA, WCLIB, or WWPA.
2. Mixed southern pine, B & B Finish No. 1 grade; SPIB.
3. Hem-fir or Hem-fir (north), Superior or C & Btr Finish grade; NLGA, WCLIB, or WWPA.
4. Spruce-pine-fir (south) or Spruce-pine-fir, grade; NELMA, NLGA, WCLIB, or WWPA.
5. Western red cedar, A grade; NLGA or WWPA.
D. For concealed boards, provide lumber with fifteen percent (15%) maximum moisture content and any of the following species and grades:
   1. Mixed southern pine, No. 2 grade; SPIB.
   2. Hem-fir or Hem-fir (north), Construction or 2 Common grade; NLGA, WCLIB, or WWPA.
   3. Spruce-pine-fir (south) or Spruce-pine-fir, Construction or 2 Common grade; NELMA, NLGA, WCLIB, or WWPA.
   4. Eastern softwoods, No. 2 Common grade; NELMA.
   5. Northern species, No. 2 Common grade; NLGA.
   6. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.06 PANEL PRODUCTS

A. Miscellaneous Concealed Plywood: Exterior sheathing, span rating to suit framing in each location, and thickness as indicated but not less than three-fourths inch (3/4").

B. Plywood Underlayment: DOC PS 1, Exterior A-C with fully sanded face, thickness as indicated but not less than three-fourths inch (3/4").

C. Miscellaneous Exposed Plywood: DOC PS 1, A-D Interior, thickness as indicated but not less than three-fourths inch (3/4").

2.07 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
   1. Where carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails: FS FF-N-105.


D. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 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.
2.08 METAL FRAMING ANCHORS

A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and acceptable to authorities having jurisdiction.


PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

D. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.

E. Countersink fastener heads on exposed carpentry work and fill holes with wood filler.

F. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

3.02 WOOD GROUND / SLEEPER, 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.

3.03 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

1. Fire block furred spaces of walls, at each floor level and at ceiling, with wood blocking or noncombustible materials accurately fitted to close furred spaces.

3.04 PANEL PRODUCT INSTALLATION

END OF SECTION 06 10 53
SECTION 07 01 50.19
MEMBRANE REROOFING PREPARATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Roof tear-off.
   2. Partial roof tear-off.
   3. Temporary roofing membrane.
   4. Roof re-cover preparation.
   5. Removal of base flashings.
   6. Protection of existing roofing system that is not reroofed.

1.03 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner’s property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.04 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA’s “The NRCA Roofing and Waterproofing Manual” for definition of terms related to roofing work in this Section.

B. Existing Membrane Roofing System: SBS-modified bituminous roofing membrane, surfacing, and components and accessories between deck and roofing membrane.

C. Substrate Board: Rigid board or panel products placed over the roof deck that serve as thermal barriers, provide a smooth substrate, or serve as a component of a fire-resistance-rated roofing system.

D. Roof Re-Cover Preparation: Existing roofing membrane that is to remain and be prepared for reuse.

E. Roof Tear-Off: Removal of existing membrane roofing system from deck.

F. Partial Roof Tear-Off: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system.
G. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.

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

1.05 SUBMITTALS

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

B. Temporary Roofing: Include Product Data and description of temporary roofing system. If temporary roof will remain in place, submit surface preparation requirements needed to receive permanent roof, and submit a letter from roofing membrane manufacturer stating acceptance of the temporary membrane, and that its inclusion will not adversely affect the roofing system’s resistance to fire and wind.

C. Fastener pull-out test report from fastener manufacturer in accordance to ANSI-SPRI FX-1 Standard.

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

E. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestos-containing material, by a landfill facility licensed to accept hazardous wastes.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Installer of new membrane roofing system.

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

C. Preliminary Reroofing Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Management and Coordination.” Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner; Owner’s representative; Owner’s insurer if applicable; testing and inspecting agency representative; roofing system manufacturer’s representative; deck Installer; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to reroofing preparation, including membrane roofing system manufacturer’s written instructions.

3. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.

4. Review roof drainage during each stage of reroofing and review roof drain plugging and plug removal procedures.
5. Review and finalize construction schedule, and verify availability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.

6. Review existing deck removal procedures and Owner notifications.

7. Review procedures to determine condition and acceptance of existing deck and base flashing substrate for reuse.

8. Review structural loading limitations of deck during reroofing.

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

10. Review HVAC shutdown and sealing of air intakes.

11. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.

12. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.

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

14. Review existing conditions that may require notification of Architect before proceeding.

15. Review HVAC shutdown and sealing of air intakes.


17. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.

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

19. Review existing conditions that may require notification of Architect before proceeding.

D. Reroofing Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

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

2. Review methods and procedures related to reroofing preparation, including membrane roofing system manufacturer’s written instructions.

3. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.

4. Review roof drainage during each stage of reroofing and review roof drain plugging and plug removal procedures.

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

6. Review existing deck removal procedures and Owner notifications.

7. Review procedures to determine condition and acceptance of existing deck for reuse.

8. Review structural loading limitations of deck during reroofing.

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

10. Review HVAC shutdown and sealing of air intakes.

11. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.

12. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.

13. Review governing regulations and requirements for insurance and certificates if applicable.
14. Review existing conditions that may require notification of Architect before proceeding.

1.07 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner’s operations will not be disrupted. Provide Owner with not less than 48 hours notice of activities that may affect Owner’s operations.

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

2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated prior to proceeding with work over the impaired deck area.

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

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

D. Owner assumes no responsibility for condition of areas to be reroofed.

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

E. Limit construction loads on roof for uniformly distributed loads.

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

G. Hazardous Materials: It is not expected that hazardous materials such as asbestos-containing materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work. Existing roof will be left no less watertight than before removal.

2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

H. Hazardous Materials: Present in building to be reroofed. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.

2. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.

3. Coordinate with hazardous material remediation Contractor to prevent water from entering building or existing roofing system.
1.08 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty. Notify warrantor before proceeding.

1. Notify warrantor of existing roofing system on completion of reroofing, and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.01 STEEL DECK PREP MATERIALS

A. Steel Decking – Use the following procedures when working on steel or metal decking.

1. Back-out Screws - All existing screws used to fasten any of the existing roof layers or roof insulation layers are to be backed out using a screw gun or other device or tool acceptable to the Roof Engineer. Screws or other fasteners are not to be pulled through the deck or otherwise forced or broken off.

2. Clean Deck - Remove all roofing debris left from tear off including sweeping or using a power blower to remove gravel and roofing debris from deck flutes.

3. Dead Penetrations - Remove all “dead” or unused penetration or equipment flashings as required by the Owner and remove them from the jobsite. Close all equipment or pipe penetration holes as shown in the drawings. Ensure that the hole is closed in such a manner as to meet the structural requirements of the drawings. New decking pieces shall span a minimum of two full bar joists or structural members.

4. Replace Corroded Decking or Rusted Decking - Prior to commencing tear off, replace severely corroded or rusted with new matching decking. Deck is to be screwed or welded into place with side and end laps matching Steel Deck Institute (SDI) specifications for such installation or the drawings in these specifications, whichever is the most stringent.

5. Screw Side Laps - Inspect the steel decking for side-lap and end-lap welding or fastening. Where side laps have not been welded or screwed, or where end or side lap welds have failed, install new self-drilling, self-tapping screws as specified or approved in advance. All side lap fastening is to be at 36” O.C. or as required to meet Factory Mutual 1-120 or UL Class 90 requirements. If primary welds have broken or become broken during roofing work, refasten deck to bar joists or structural members at the proper frequency with approved fasteners.

6. Repair Rust or Corrosion - Where minor or surface rust is visible, such rust is to be wire brushed and painted with rust inhibiting primer before the commencement of roof application.

a. Rustoleum Rust Primer

7. Paint Screw Holes - Old screw holes shall be painted with rust-inhibiting primer.

2.02 TEMPORARY ROOFING MATERIALS

A. Selection of materials and design of temporary roofing is responsibility of Contractor.
B. Temporary roof membrane over cover board:
   1. Firestone Building Products; APP 160 Smooth Surfaced Ply Sheet torch applied.
   3. Approved equal.

C. Asphalt Emulsion Primer: ASTM D 41.

2.03 COVER BOARDS

A. Recover Board: USG Securock Gypsum Fiber Board; 1/2 inch thick.

B. Fasteners: Factory-coated steel fasteners, No. 14, and metal or plastic plates listed in
   FMG's "Approval Guide," designed for fastening recover boards to deck.

C. Cover board shall be fastened to the steel decking with a fastener and plate, one every
   square foot, 32 fasteners per 4 ft. by 8 ft. board. (One fastener every square foot).

2.04 AUXILIARY REROOFING MATERIALS

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

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

C. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal
   Flashing and Trim."

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect existing membrane roofing system that is indicated not to be reroofed.
   1. Loosely lay 1/2" plywood or OSB panels over existing roof surface.
   2. Limit traffic and material storage to areas of existing roofing membrane that have
      been protected.
   3. Maintain temporary protection and leave in place until replacement roofing has been
      completed.

B. 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.

C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid
   installation of temporary protection in the event of unexpected rain.
D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

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

E. Verify that rooftop utilities and service piping have been shut off before commencing Work.

F. Lowering material: Provide hoists and enclosed chutes as required to lower removed material. Throwing, dropping, or permitting the free fall of material and debris from heights that would cause damage to work, or to plantings, or cause undue noise or nuisance, or excessive dust, is expressly prohibited.

3.02 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed.

B. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.

1. Remove cover boards and roof insulation.

2. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry. Remove unadhered bitumen and felts and wet felts.

3. Remove excess asphalt from deck.

3.03 DECK PREPARATION

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

B. If deck surface is not suitable for receiving new roofing, or if structural integrity of deck is suspect, immediately notify Consultant. Do not proceed with installation until directed by Architect.

3.04 CATEGORY II (NON-FRIABLE) ASBESTOS CONTAINING MATERIALS (ACM) REMOVAL

A. Owner and Contractor agree to exonerate, indemnify, defend, and hold harmless the roofing material manufacturer from and against all claims, demands, lawsuits, damages, expenses and losses incurred by Contractor’s removal of asbestos-containing materials from Owner’s building and work site. Contractor must conduct its operations according to applicable requirements including but not limited to those established by:

1. Occupation Safety and Health Administration (OSHA).

2. Environmental Protection Agency (EPA).

3. Department of Transportation (DOT).

4. State or Local Air Pollution Control Authorities/Agencies.

5. State or Local Solid Waste or Hazardous Waste Authorities/Agencies.
6. State or Local Health Department(s).
7. State or Local Building Code Authorities.
8. Other federal, state or local agencies or authorities.

B. Contractor or Owner shall perform appropriate inspections, surveys and file timely notifications to proper authorities prior to starting roof renovation or demolition activities. Inspectors, project planners, project managers, contractors and workers involved in the roof project shall have appropriate training, licenses and registrations. Contractor and Owner shall be responsible for determining and implementing regulatory compliance activities, including but not limited to work practices, engineering controls, personal protection, air monitoring, testing, hazard communication, material handling, record retention, and arranging for waste disposal/handling.

C. Contractor must file a Uniform Hazardous Waste Manifest from proper landfill site for each load of asbestos containing material removed. Copies must be sent to Owner and material manufacturer/specifier. Transportation of waste shall be in accordance with applicable Department of Transportation (DOT) requirements.

3.05 TEMPORARY ROOFING MEMBRANE

A. Install one ply or approved temporary roofing membrane over area to be reroofed.

B. Install temporary roofing membrane over area to be reroofed. Install one ply of specified APP torch grade smooth surfaced ply sheet.

C. Remove temporary roofing membrane before installing new roofing membrane.

D. Prepare the temporary roof to receive new roofing membrane by patching and repairing temporary roofing membrane Restore temporary roofing membrane to watertight condition. Obtain approval for temporary roof substrate from membrane manufacturer and Consultant prior to installation of new roof.

3.06 FASTENER PULL-OUT TESTING

A. Perform fastener pull-out tests according to SPRI FX-1 and submit test report to Architect before installing new membrane roofing system.

1. Obtain Architect’s approval to proceed with specified fastening pattern. Architect may furnish revised fastening pattern commensurate with pull-out test results.

3.07 DISPOSAL

A. Collect and place demolished materials 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 will not be permitted.

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

END OF SECTION 07 01 50.19
PART 1 - GENERAL

1.01 REFERENCES (INCLUDING LATEST REVISIONS)

A. Comply with governing local, state, and federal regulations, safety standards, and codes.

B. Testing Laboratory Services: Test results shall meet or exceed established standards.

C. Underwriters Laboratories, Inc. (Roofing Covering): Class A fire hazard classification.

D. American Society of Testing Materials (ASTM)


2. C 209 Methods of Testing Insulating Board (Cellulosic Fiber), Structural and Decorative

3. C 728 Perlite Thermal Insulation Board

4. D 41 Asphalt Primer Used in Roofing and Waterproofing

5. D 312 Asphalt Used in Roofing


7. D 4601 Asphalt Coated Glass Fiber Base Sheet Used in Roofing

E. The National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual


G. American Society of Civil Engineers - ASCE 7 Minimum Design Loads for Buildings and Other Structures (for wind uplift criteria)

1.02 QUALITY ASSURANCE

A. Regulatory Requirements

1. Classified by Underwriter’s Laboratories (UL) as Class A roof covering.

2. Follow local, state, and federal regulations, safety standards, and codes.

B. Installation

1. Installation shall be in accordance with manufacturer’s current published application procedures, NRCA general recommendations, and ASCE 7 wind uplift criteria.

2. Roof system manufacturer’s technical specifications shall be considered part of this specification and shall be used as reference for specific application procedures.

C. Contract Documents

1. In the case of an inconsistency between the drawings and specifications or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Project Manager’s/Architect’s interpretation.
1.03 SUBMITTALS

A. Product Data: Submit Manufacturer’s product data sheets for each product.

B. Shop Drawings: Layout of roof plan showing tapered design, tapered insulation pattern, direction of slope, amount of slope, spot elevations indicating thicknesses at high and low points.

C. Certification: Submit roof manufacturer’s certification in writing that insulation is acceptable as substrate for application of specified roof system.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store materials in accordance with manufacturer’s recommendations.

B. When stored outdoors:
   1. Tarp and shield insulation from moisture and ultraviolet rays.
   2. Elevate insulation above substrate four inches minimum.
   3. Secure insulation to resist high winds.
   4. Distribute insulation stored on roof deck to prevent concentrated loads that would impose excessive stress or stain on deck or structural members. Verify that structure can accommodate additional loading.
   5. Wet insulation, or insulation that has been wet but which has dried, may not be used and shall be removed completely and immediately from the job site.
   6. Do not double stack bundles of insulation on the roof top.

1.05 SEQUENCING AND SCHEDULING

A. Substrate Acceptance: Roof system manufacturer’s representative shall inspect roof deck and associated substrates and provide written acceptance of conditions.

B. Manufacturer’s approved roofing contractor shall inspect and approve deck and substrates.

C. Plan roof layout with respect to roof deck slope to prevent rainwater drainage into completed roofing.

D. Do not install more insulation than can be covered with complete roof system in same day.

1.06 PRODUCT CONDITIONS

A. Environmental Requirements:
   1. Apply roofing and insulation in dry weather.
   2. Do not proceed with roof construction during inclement weather or when precipitation is predicted 40% or more possibility.
   3. Do not apply insulation over wet or moist deck or in foggy conditions.
   4. Days with wind speeds of 30 mph or greater shall be considered “Bad Weather” days.

B. Emergency Equipment: Maintain on-site equipment and material necessary to apply emergency temporary seals I the event of sudden storms or inclement weather.
C. Costs for emergency roofing shall be borne by Contractor.

PART 2 - PRODUCTS

2.01 INSULATION – FLAT STOCK

A. All insulation shall be approved in writing by the membrane manufacturer as to thickness, type, and manufacturer. All insulation must be approved for the specific application, Underwriters Laboratory approved, and be listed in the FM Global Approval Guide.

B. Polyisocyanurate Roof Insulation: Insulation shall be two layers of rigid polyisocyanurate foam board; meeting Federal Specification No. HH-I-1972/1 or 2 with 20 psi minimum compressive strength and 2.0 pcf minimum density. No layer shall be less than 1.5", but not greater than 2.7". Minimum R-value over each roof area, shall meet or exceed R-25. Boards shall be surfaced on two (2) sides with non-asphaltic facer material.
   1. Basis of design: Tremco; Trisotech.

2.02 INSULATION – TAPERED

A. Factory Tapered Polyisocyanurate for Field of Roof Structurally Flat Roof Areas: Shall be tapered polyisocyanurate board, with a 20 psi minimum compressive strength and nominal 2.0 pcf density. Insulation shall be of thickness required for one-fourth inch (1/4") slope per foot to roof drains as shown on drawings with a starting minimum edge thickness of one and one-half inch (1-1/2"). Minimum R-value over each roof area shall meet or exceed R-25. Insulation shall be surfaced on two (2) sides with a non-asphaltic facer material.
   1. Basis of design: Tremco; Trisotech.

B. Factory Tapered Polyisocyanurate Crickets: Factory cut forty-eight inch by forty-eight inch (48" x 48") polyisocyanurate board cut to one-half inch (1/2") per foot slope used in conjunction with standard thickness of polyisocyanurate board to provide positive slope.
   1. Basis of design: Tremco; Trisotech.

2.03 COVER BOARD

A. Shall be impact-resistant, nonstructural, specially engineered high-performance cement-based roof board. Board size four feet by eight feet (4' x 8'), thickness 1/2"; conforming to ASTM C1325, meeting FM 4470 Class 1 criteria, classified by Underwriters Laboratories, and listed in the FM Global Approval Guide. Board will meet the following physical properties. Basis of design: Securock® Cement Roof Board, as manufactured by USG Corporation, or approved equal.

<table>
<thead>
<tr>
<th>Test</th>
<th>Typical Value</th>
<th>Test Method</th>
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<tbody>
<tr>
<td>Fire Resistance</td>
<td>Class A</td>
<td>UL 790</td>
</tr>
</tbody>
</table>
Permeance \( \leq 5.84 \) ASTM E96
Water absorption % max. < 15 ASTM C473
Mold Resistance Minimum rating of "10" ASTM D3273

2.04 ASPHALT ROOF PRIMER

A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces.
Basis of design: Tremco, Tremain WB, or manufacturer approved equal.
1. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 2 g/l.

B. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

2.05 BASE SHEET LAP & CENTER FASTENER ROW STRIPING ADHESIVE

A. Two-Part Urethane Insulation Adhesive (UIA) is a two-component polyurethane adhesive used for attaching insulation boards to the roof deck or to other insulation boards
1. Basis of design product: Tremco POWERply Bio Endure Adhesive
   a. Tremco: POWERply Bio Endure Adhesive

2.06 MECHANICAL FASTENERS

A. Fasteners Engineered to secure insulation, cover boards, base sheets and single ply roofing membrane systems to corrugated steel substrate
1. Tremco; #15 EHD with Tremco 2.4 inch barbed Seam Plates
2. Trufast; #15 EHD with Trufast 2.4 inch barbed Seam Plates

PART 3 - EXECUTION

3.01 PROTECTION OF ROOFING

A. Provide special protection from traffic on yet to be removed roofing.
B. Provide special protection from traffic on completed work.

3.02 EXAMINATION AND PREPARATION

A. Do not install until defects are corrected and deck substrate meets roof system manufacturer’s requirements.
B. Examine substrate and related surfaces and verify that there are no conditions such as debris, foreign materials, moisture, ridges, depressions, or other conditions which would prevent satisfactory installation of roof system.
C. Start of work constitutes acceptance of deck substrate and site conditions.
D. Sweep deck substrate clean of dust and debris immediately prior to installation of insulations, and cover boards.
3.03 APPLICATION OF INSULATION – GENERAL INSTRUCTIONS

A. Manufacturer’s Instructions: In regard to attachment, the manufacturer’s instructions or specifications shall determine the suitability for an application. Installation must meet ASCE 7 criteria and meet local governing building codes.

B. Thermal insulation boards shall be laid on the substrate in parallel rows with end joints staggered and butted as close as possible. All joints shall be tight and at the roof perimeter and roof penetrations, insulation shall be cut neatly and fitted to reduce openings to a minimum. All openings one-fourth inch (1/4") or larger shall be filled with insulation.

C. Insulation shall be tapered into sumps at drains and scuppers to provide proper drainage (if applicable).

D. No more insulation shall be installed than can be covered by the completed roof system by the end of the day or the onset of inclement weather.

E. Tapered insulation and crickets, when specified, shall be placed in accordance with the drawings and/or as required to minimum of NRCA standards.

3.04 APPLICATION OF INSULATION – LOOSE LAID and MECHANICALLY FASTENED

A. Flat stock insulation shall be laid with edges parallel to flutes and bearing on deck surface/flats. The long dimension of first layer of insulation must be fully supported by the top flange of the metal deck. The edges of insulation boards must not cantilever over the flutes of the metal deck.

B. First layer of specified flat stock insulation shall be loose laid over the deck. Boards shall be staggered and butted as close as possible with voids over one-fourth inch (1/4") to be filled. Maintenance fasteners may be used to temporarily secure in place until installation of subsequent layers is completed.

C. The second layer of specified flat stock insulation shall be applied over the first layer using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer.

D. Where tapered insulation is required for slopes (including crickets & saddles), it shall be applied (loose laid) over the previously installed layer using offset joints, so that each layer breaks joints a minimum of six (6") both ways with the preceding layer.

E. The specified cover board shall be applied to the top surface of the preceding layer of insulation or tapered insulation as applicable using offset joints, so that each layer breaks joints to a minimum of six inches (6") both ways with the preceding layer. The specified base sheet (anchor sheet) shall then be mechanically fastened through all layers and into the existing metal deck to conform to the ASCE 7 criteria for wind uplift as dictated by wind zone applicable to location of project.
1. Fasteners and fastening patterns shall be determined by building height, location and geographical area of the United States. It is the contractor’s responsibility to consult current publications, literature, and bulletins of IBC and the manufacturer that are in effect at the time of this project. Boards shall be staggered and butted as close as possible with voids over one-fourth inch (1/4”) to be filled.

3.05 ADJUSTING

A. Remove insulation which has been damaged (broken, cracked, punctured, wet, etc.) and install acceptable new units before installation of roof system.

3.06 CLEANING

A. Remove debris and material wrappers from jobsite. Leave insulation clean and dry, ready to receive roofing membrane.

END OF SECTION 07 22 16
SECTION 07 52 16
SBS ASPHALT MODIFIED BITUMEN ROOF SYSTEM
TORCH APPLIED (Steel Deck)

PART 1 - GENERAL

1.0 AREAS COVERED

A. Low sloped roof areas as indicated on plans.

1.02 DEFINITIONS

ACM Asbestos Containing Materials
ASCE American Society of Civil Engineers
ASTM American Society for Testing and Materials
CTEM Coal-Tar Elastomeric Membrane
EIP Ethylene Interpolymer
EPA Environmental Protection Agency
EPDM Ethylene Propylene Diene Monomer
EPS Expanded Polystyrene
EVT Equiviscous Temperatures
FM Factory Mutual
IBC International Building Code
KEE Ketone Ethylene Ester
NDL No Dollar Limit
NESHAP National Emissions Standards for Hazardous Air Pollutants
NRCA National Roofing Contractors Association
OSHA Occupational Safety & Health Administration
SBS Styrene-Butadiene-Styrene
SDI Steel Deck Institute
SMACNA Sheet Metal and Air Conditioning Contractors National Association
UL Underwriters Laboratories, Inc.

1.03 REFERENCES (INCLUDING LATEST REVISIONS)

A. Comply with governing local, state, and federal regulations, safety standards, and codes.
B. Testing Laboratory Services: Test results shall meet or exceed established standards.
C. Underwriters Laboratories, Inc. (Roofing Covering): Class A fire hazard classification.
D. American Society for Testing and Materials (ASTM)
E. The National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual
F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual
G. American Society of Civil Engineers – ASCE 7

1.04 INSTALLER QUALIFICATIONS

A. Roofing installer must be:
1. Currently prequalified with the Owner in accordance with Owner’s prequalification requirements.
2. Currently in good standing with the manufacturer.
3. Installer must be an experienced single firm specializing in the type of roofing repair and/or removal and replacement work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years successful experience on projects similar in size and scope and acceptable as applicators by the Owner’s representative.
4. Contractor must have successfully completed previous projects warranted by the manufacturer.

B. It shall remain each Bidder’s responsibility to determine his current status with the manufacturer’s certification plan.

C. Contractor shall be an employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five (5) years’ experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, Consultant, Owner, and employees, and qualified by the manufacturer to install manufacturer’s product and furnish warranty of type specified.
1. For torch-applies applications, employ workers certified under NRCA’S Certified Roofing Torch Applicator (CERTA) program.
2. Installer must provide (2) manufacturer inspections each week. Noncompliance May result in a $850.00 per day fee for missing inspections.

1.05 MANUFACTURER QUALIFICATIONS

A. Manufacturer Qualifications: Approved manufacturer with UL listed roofing systems comparable to those specified for this Project, with minimum fifteen (15) years’ experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.

B. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observations and inspections in Field Quality Control Article, to determine Installers compliance with the requirements of this project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.

C. Random Sampling:
1. During the course of work, the Architect may secure samples according to ASTM D140-93 of material being used from containers at job site and submit them to an Independent laboratory for comparison to specified material.
2. Should test results prove that material is not equal to specified material:
a. Contractor shall pay for all testing.
b. Roofing installed and found not to comply with the specifications shall be removed and replaced with no change in the contract price.

D. Installation Quality Control:
1. The roofing inspector shall provide written and digital photographic reports, to be submitted to the Architect, Consultant, Owner, roof system installation Contractor, appraising the installation of the roof system at each of the project progress stages. The installation contractor shall make all necessary corrections, additions or remedial actions to resolve any issues raised in the reports.
2. The roofing inspector shall have the authority to have any and all roofing work corrected, as required, to insure the proper installation and weather-tightness of the roof system, in accordance with the manufacturer’s specifications.

E. Manufacturer’s Installation Instructions: Obtain and maintain on-site access to manufacturer’s written instructions for installation of products.

F. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Architect, Owner’s insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer’s representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review drawings and specifications.
3. Review methods and procedures related to roofing installation, including manufacturer’s written instructions.
4. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.06 CONTRACT DOCUMENT QUALITY ASSURANCE

A. In the case of an inconsistency between the drawings and specifications or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Project Manager’s/Architect’s interpretation.
1.07 SUBMITTALS

A. Samples and Manufacturer’s Submittals: Submit prior to delivery or installation. Submittals shall be in digital format and shall include but not necessarily limited to the following:

1. Samples of all roofing system components including all specified accessories.
2. Samples of all materials used on the project, which are not supplied by the membrane manufacturer, shall be submitted to the membrane manufacturer for written approval prior to work starting.
3. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
4. Submit latest edition of manufacturer’s specifications and installation procedures. Submit only those items applicable to this project.
5. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
6. Submit evidence of compliance with performance requirements, for wind uplift.
7. Submit securement/anchorage/fastening methods and/or requirements of nailers, sheet metal, equipment, etc. for Texas Windstorm Certification requirements, reviewed and sealed by a licensed/certified Texas Windstorm Engineer/Inspector currently in good standing with the Texas Department of Insurance.

B. Shop Drawings: Provide digital CAD; job specific manufacturer’s approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings. Photocopies, tracings, or hand sketches of details from project documents are not permitted.

C. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner three copies of the manufacturer’s printed instructions regarding care and maintenance of the roof.

1.08 QUALITY ASSURANCE

A. Regulatory Requirements:

1. System shall be classified by Underwriters Laboratories Inc., UL 790, as Class A roof covering.
2. Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.
3. Follow local, state, and federal requirements, safety standards, and codes.
4. Refer to applicable building codes for roofing system installation requirements and limitations. When conflict exists, the more restrictive document will govern.
5. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.
   a. Underwriters Laboratories Class A acceptance of the proposed roofing system.
   b. Evidence by an accredited independent testing agency or agencies that the roof configuration meets or exceeds the design wind uplift pressures indicated on project documents.
6. Acceptable Contractor: Contractor shall have a minimum of five (5) year’s experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products.

7. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

8. Upon completion of this project, the contractor shall at no expense or additional cost to the Owner or its agent provide Windstorm Certification from the state of Texas. The contractor shall at his expense, contract with a currently approved and certified Windstorm inspector/engineer to provide necessary inspections for Windstorm certification compliance.

B. Pre-installation Conference:
1. Prior to roofing installation, conduct pre-installation conference at project site.
2. Attendance: Owner, Consultant, Contractor, project superintendent, roof applicator, and roof manufacturer’s technical representative.
3. Agenda:
   a) Scheduling of roofing operation.
   b) Daily production anticipated.
   c) Designation of key individuals and their respective responsibilities.
   d) Processing procedures of field and change orders.
   e) Review of staging and material storage locations.
   f) Accommodations for temporary services (water, power).
   g) Coordination of work by other trades.
   h) Protection of completed roofing.
   i) Emergency rain protection procedures.
   j) Discussion of process for manufacturer’s inspection and acceptance of completed roofing and flashings.
   k) Manufacturer’s deck inspection to be performed.

C. Installation:
1. Installation shall be in accordance with current published application procedures and standards set forth by the National Roofing Contractors Association.
2. Follow Underwriters Laboratories’ requirements acceptable for use with specified products or systems.
3. Installation shall be in accordance with manufacturer’s current published application procedures.
4. Roofing shall be as described in this section and shall be provided and approved by roof system manufacturer. Materials not manufactured or provided by manufacturer shall have written approval from manufacturer stating that materials are acceptable and are compatible with other materials and systems required.
5. There shall be no deviations made from manufacturer’s published specification, this specification, or approved shop drawings without prior written approval of Owner’s representative and Roof Membrane Manufacturer.
6. Perform work on this section in accordance with best standards of practice relating to trades involved.
D. Pullout Tests: Conduct pullout test on deck, where applicable; using appropriate fastener prior to roof system installation. Submit pullout results for manufacturer's review to determine specific fastening pattern for this project, minimum uplift requirements shall conform to current ASCE 7 criteria.

E. Material Manufacturer's Inspection Paid for By Contractor: Minimum of two inspections per week; and shall be made during and until all construction is complete and accepted by the Owner/Architect/Consultant. Inspections shall be made by an authorized representative of roof system manufacturer to ensure that said Project is installed in accordance with manufacturer's requirements. Manufacturer shall provide written report to the Owner's Architect/Consultant/Project Manager representatives within five days of each inspection stating acceptance of Contractor procedures and outlining items of non-compliance with manufacturer's requirements. It is the contractors responsibility to schedule with the manufacturer and notify the Architect/Engineer/Consultant.

F. Material Manufacturer's Final Inspection:
1. Manufacturer's authorized representative shall provide final inspection at completion of project to ensure that project has been completed in accordance with manufacturer's requirements. Upon approval and acceptance of project, manufacturer's warranty certification shall be written, executed, and furnished to Owner.
2. Contractor shall pay for manufacturer's final inspection and additional inspections.

G. Laboratory Testing and Samples:
1. At Owner's request, obtain 3 field samples of completed roof membrane and assembly. Take samples at locations designated by Owner's representative, and test for compliance with requirements on Contract Documents and with manufacturer's published performance criteria. Test shall be performed by nationally recognized testing laboratory in accordance with accepted ASTM methods. Contractor shall assume costs for extraction and patch of samples. Owner will assume costs for testing of field sample.
2. Correct deficiencies in accordance with manufacturer's recommended procedures at no cost to Owner.
3. If, for any reason, areas that are tested by Owner fail to meet manufacturer's requirements, then subsequent expense for retesting of those areas will be borne by Contractor.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers and rolls with all labels intact and legible including labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

B. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Breathable canvas tarpaulin with grommets shall be minimum acceptable for exterior coverings. All materials stored as above shall be minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope. Refer to manufacturer's published specifications and recommendations for additional storage requirements for materials.
C. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

D. Deliver materials in sufficient quantity to allow continuity of work.

E. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers.

F. Handle rolled goods so as to prevent damage to edge or ends.

G. Select and operate material handling equipment so as not to damage existing construction or applied roofing.

H. Moisture-sensitive products shall be maintained in dry storage areas and properly covered. Provide continuous protection of materials against wetting and moisture absorption. Store roofing and flashing materials on clean raised platforms with weather protective covering when stored outdoors.

I. Store rolled goods on end.

J. Protect materials against damage by construction traffic.

K. The proper storage of materials is the sole responsibility of the contractor and any wet or damaged roofing materials shall be discarded, removed from the project site, and replaced prior to application.

L. Comply with fire and safety regulations, especially with materials which are extremely flammable and/or toxic. Use safety precautions indicated on labels.

M. Products liable, such as emulsions, to degrade as a result of being frozen shall be maintained above 40°F in heated storage.

N. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form.

O. The contractor is to erect a temporary chain link fence, minimum six feet (6') in height, around work area stage and kettles. Fence is to be secured on a daily basis.

1.10 SITE CONDITIONS

A. Job Condition Requirements:
   1. Coordinate the work of the contractor with the work to be performed by other trades, to ensure proper sequencing of the entire work. The contractor is to schedule his work so that adequate time is allowed for other trades to perform their work.
   2. Apply roofing in dry weather.
   3. Do not apply roofing when ambient temperature is below 40°F. Maintain a minimum roof membrane material temperature above 60°F.
4. Proceed with roofing work only when weather conditions are in compliance with manufacturer’s recommended limitations, and when conditions will permit the work to proceed in accordance with specifications.

5. Schedule the work so the building will be left watertight at the end of each day. Do not remove more roofing or insulation material than can be reinstalled in any working day.

6. Load placed on the roof at any point shall not exceed the safe load for which the roof is designed.

7. All surfaces to receive new roofing shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Owner.

8. The contractor is to be aware of the potential for roof leaks on the existing roof as a result of ruptured blisters and/or roof mat damage caused by the vacuum process, foot traffic, or material and equipment storage. The contractor is to take all necessary precautions to prevent damage to the existing roof. All damage to the existing roof that could result in roof leaks is to be repaired on a daily basis by the roofing contractor.

9. The contractor shall follow local, state, and federal regulations, safety standards, and codes for the removal, handling, and disposal of asbestos containing materials, if present. When a conflict exists, use the stricter document.

10. Due caution should be exercised so as not to alter the structural integrity of the deck. When cutting through any deck, care should be taken so as not to damage the deck or any part of the deck, such as post tension cables, etc.

11. The contractor is to verify the location of all interior ducts, electrical lines, piping, conduit, and/or similar obstructions. The contractor is to perform all work in such a manner as to avoid contact with the above mentioned items.

12. Surface and air temperatures should be a minimum 40° F during applications of cleaner and waterproof coating and remain above 40° F for a minimum of four (4) hours following applications. Verify compatibility of cleaner with coatings, paints, primers and joint sealers specified. Advise Owner’s representative of any problems in this regard prior to commencing cleaning operations.

13. Temporary Sanitary Facilities: The contractor shall furnish and maintain temporary sanitary facilities for employees’ use during this project. These will be removed after the completion of the project. All portable facilities shall comply with local laws, codes, and regulations.

14. For further information regarding roofing material manufacturer’s recommendations for project conditions, refer to the manufacturer’s published application manual.

15. The contractor shall take all necessary precautions to protect the roof mat and deck from damage. The contractor shall be responsible for repairing all new areas of damage caused by the negligence of the contractor, at the contractor’s expense. The Owner’s on-site representative shall determine damage caused by contractor negligence.
B. Protection of Work and Property:
   1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner’s and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his proposal.
   2. Property: Protect existing planting and landscaping as necessary or required to provide and maintain clearance and access to the work of this contract. Examples of two categories or degrees of protection are generally as follows: a) removal, protection, preservation, or replacement and replanting of plant materials; b) protection of plant materials in place, and replacement of any damage resulting from the contractor’s operations.
   3. Twenty-four Hour Call: The contractor shall have personnel on call 24 hours per day, seven (7) days per week for emergencies during the course of a job. The Owner’s Project Manager is to have the 24 hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner’s Project Manager are to be mobile, home and office numbers for:
      a) Job Foreman
      b) Job Superintendent
      c) Owner or Company Officer

C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds must be repaired at the successful contractor’s expense holding the Owner harmless from any other claims for property damage and/or personal injury.

D. Measurements: It will be the contractor’s responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.

E. Use of Premises:
   1. The contractor is advised that the Owner will occupy the building at all times, and the contractor must provide all safeguards required to protect personnel and to keep noise levels as low as reasonably possible for each operation.
   2. The contractor shall:
      a) Coordinate work in such a manner as to not interfere with the normal operation of the building.
      b) Assume full responsibility for protection and safekeeping of products stored on premises.
      c) Agree to hold the Owner harmless in any and all liability of every nature and description which may be suffered through bodily injuries, including death of any persons by reason of negligence of the contractor, agents, employees, or subcontractors.
F. Cleaning and Disposal of Materials:
   1. Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean and shall allow no roofing materials to remain on the outside walls.
   2. All waste materials, rubbish, etc., shall be removed from the Owner’s premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. A suitable scrap chute or hoist must be used to lower any debris. At completion, all work areas shall be left broom clean and all contractor’s equipment and materials removed from the site.
   3. All bituminous or roofing related materials shall be removed from ladders, stairs, railings, and similar parts of the building.
   4. Debris shall be deposited at an approved disposal site.

1.11 SEQUENCING AND SCHEDULING

A. Coordinate roofing schedule with work of other trades.

B. Plan lay up roofing membrane with respect to deck slope. Avoid situations where excessive drainage could pass into completed roofing.

C. Maintain communication with roofing manufacturer’s representative to inform of progress and to schedule periodic sample testing.

D. All penetrations shall be made in roof prior to beginning with roof installation.

1.12 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer’s disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Manufacturer’s Warranty: Manufacturer’s standard or customized form, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
   1. Manufacturer’s warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section.
   2. Warranty Period: Twenty (20) years from date of Substantial Completion.

C. Installer’s 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 roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:
   1. Warranty Period: Two (2) years from date of Substantial Completion.

D. Extended Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:
1. Sheet metal flashing and trim, including roof penetration flashings.

E. Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections and preventive maintenance is included in the Contract Sum.

1. Inspections to occur in the following years subsequent to completion: 2, 5, 10 and 17.

F. During the proposal period each Bidder shall make arrangements with the material manufacturer to provide the required warranty. Refer to SUBMITTALS Paragraph in this section for requirements concerning submittals of warranty.

1.13 SAFETY GUIDELINES FOR TORCH APPLICATIONS

A. All Safety guidelines of the NRCA/MRCA CERTA Safety Practices for Roofing Torch Use shall be strictly adhered to. Some of these safety guidelines are listed below but are not all inclusive.

1. Pre-Job Planning:
   a) Identify and protect plywood, oriented strand board (OSB), wood plank, wood fiberboard and other combustible building components as follows:
      i. The job foreman or supervisor shall review daily with the building owner conditions that could present hazards during torching and address them.
      ii. Address possible fire traps and hidden hazards.
   b) Have a minimum of two (2) 4A60BC fire extinguishers available within ten feet (10') of all torch operations.
   c) All personnel on the roof shall be trained on how to use a fire extinguisher.
   d) Inspect all penetrations, such as exhaust vents, inside and outside. Lint, grease or other substances, if present, shall be cleaned prior to torching work.
   e) Have a working cell phone with a fully charged battery available for communicating with 911 or another emergency responder, with the local fire department number pre-programmed in the cell phone.
   f) Comply with all state and local ordinances where applicable.

2. Torching Safety:
   a) Only NRCA/MRCA CERTA or approved equivalent certified torch applicators shall operate torches when an open flame will come in contact with any part of a roof.
   b) Protect materials that may burn when in contact with an open flame. Never torch directly to any combustible material.
   c) Never torch directly in an area where you cannot see the path of the open flame (including – but not limited to – flashings, corners, curbs, voids, expansion joints and small roof penetrations). Use alternative application methods that are acceptable to the membrane manufacturer in these areas.
   d) A lit torch shall only be placed on the roof surface using a functional torch stand.
   e) A lit torch shall never be left unattended.

3. End-of-Day Fire Watch:
   a) A minimum two-hour fire watch, as described in the NRCA/MRCA CERTA training program, shall be conducted by a properly trained and dedicated individual: it shall include checking the roof's underside for smoldering (whenever possible), as well as the top side.
b) The designated person to conduct a fire watch must be competent and have authority to take action in the event a fire is detected.
c) No full-time torch shall be used under any circumstances.

4. Fire Extinguishers:
   a) All fire extinguishers shall be fully charged.
   b) Each torch operator should have a fire extinguisher within ten feet (10') of torching work.
   c) A minimum of two fire extinguishers should be readily available within ten feet (10') of all torching activities.
   d) Fire extinguishers should be placed no closer than ten feet (10') from any propane cylinder.
   e) A fire extinguisher should be placed near the access to the attic areas.
   f) All fire extinguishers must have a valid, up-to-date inspection tag by an authorized service provider affixed.
   g) All fire extinguishers must have a plastic seal band in place through the release pin. This ensures the pin has not been previously removed and the extinguisher has not been discharged.
   h) If a fire extinguisher is discharged for any reason --- even partially discharged --- it should be removed from the job site until it can be serviced and recharged by an approved provider.
   i) Fire extinguishers and propane cylinders shall be stored according to safety guidelines in a secured area at the end of each workday.

PART 2 - PRODUCTS

2.01 GENERAL

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

   B. All materials shall be furnished, specified, or approved in writing by the manufacturer issuing the warranty.

   C. All materials used on the project shall be asbestos free.

   D. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

2.02 MEMBRANE SYSTEM


   IT IS THE BIDDERS RESPONSIBILITY TO READ AND UNDERSTAND THE TESTED ASSEMBLY. IF NEEDED A COPY OF THE TESTED CONSTRUCTION ASSEMBLY LISTED ABOVE CAN BE OBTAINED FROM THE SYSTEM MANUFACTURER.
B. A fire rated roof membrane assembly consisting of three (3) plies of a prefabricated,
reinforced, homogeneous, styrene-butadiene-styrene (SBS) copolymer modified asphalt
membrane.

C. Modified Bitumen Base Sheet (Anchor Sheet):
1. ASTM D 6163 Type I Grade S SBS/SIS/SEBS-modified asphalt-coated glass-fiber
reinforced sheet, smooth surfaced, designed for heat-welded applications.
   b. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: 70 lbf/in
(12.3 kN/m) machine direction; 50 lbf/in (8.8 kN/m) cross-machine direction.
   c. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: 100 lbf (445 N)
   machine direction; 80 lbf (400 N) machine direction.
   f. Thickness, ASTM D 5147: 0.118 inch (3.0 mm).

D. SBS Modified Bituminous Membrane Ply Sheets:
1. ASTM D 6163 Type I Grade S SBS/SIS/SEBS-modified asphalt-coated glass-fiber
reinforced sheet, smooth surfaced, designed for heat-welded applications.
   b. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: 70 lbf/in
(12.3 kN/m) machine direction; 50 lbf/in (8.8 kN/m) cross-machine direction.
   c. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: 100 lbf (445 N)
   machine direction; 80 lbf (400 N) machine direction.
   f. Thickness, ASTM D 5147: 0.118 inch (3.0 mm).

E. SBS Modified Bituminous Cap Sheet:
1. ASTM D 6163 Type I Grade G SBS-modified asphalt-coated glass-fiber-reinforced
sheet, designed for heat welded application, granular surfaced with a factory applied
white reflective granule; CRRC listed and California Title 24 Energy Code compliant.
   b. Exterior Fire-Test Exposure, ASTM E 108: Class A.
   c. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine
direction 70 lbf/in (12.0 kN/m); Cross machine direction 50 lbf/in (8.8 kN/m).
   d. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine
direction, 100 lbf (445 N); Cross machine direction 90 lbf (400 N).
   e. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine
direction 4 percent; Cross machine direction 4 percent.
   g. Thickness, minimum, ASTM D 5147: 0.165 inch (4.2 mm).

F. Base Flashing Backer Sheet:
1. ASTM D 6162 Type III Grade S SBS/SIS/SEBS-modified asphalt-coated
composite polyester and glass-fiber reinforced sheet, smooth surfaced, designed
for heat-welded applications.
b. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: 275 lbf/in (48 kN/m).


d. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: 3 percent.


f. Thickness, ASTM D 5147: 0.090 inch (2.3 mm).

G. Base Flashing Sheet:
1. ASTM D 6163 Type I Grade G SBS-modified asphalt-coated glass-fiber-reinforced sheet, designed for heat welded application, granular surfaced with a factory applied white reflective granule; CRRC listed and California Title 24 Energy Code compliant.


b. Exterior Fire-Test Exposure, ASTM E 108: Class A.

c. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 70 lbf/in (12.0 kN/m); Cross machine direction 50 lbf/in (8.8 kN/m).

d. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction, 100 lbf (445 N); Cross machine direction 90 lbf (400 N).

e. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 4 percent; Cross machine direction 4 percent.


g. Thickness, minimum, ASTM D 5147: 0.165 inch (4.2 mm).


2.03 AUXILIARY ROOFING MATERIALS

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

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

B. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Miscellaneous Accessories."

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

1. Elastomeric Roofing Mastic, Low-Volatile: One-part, trowel-grade, elastomeric roof mastic specially formulated for compatibility and use with specified roofing membranes and flashings.

a. Basis of design product: Tremco, POLYroof LV.

b. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 300 g/L.


d. Recovery from 500 percent Elongation, minimum, ASTM D 412: 500 percent.

e. Flexibility at -40 deg. F (-40 deg. C), ASTM D 3111: No cracking.
2. Asphalt mastic for miscellaneous sealing and waterproofing:
   a. An asphalt-based, heavily fibrated, asbestos free mastic.
   b. Basis of Design: Tremco ELS.

3. Pitch pan mastic:
   a. High performance single component roof elastomer.
   b. Basis of Design: Tremco POLYroof LV
   c. CHEM CURBS ARE NOT ACCEPTABLE

4. Metal Joint Sealant:
   a. Asbestos-free. Moisture cured, one-component polyurethane sealant.
   b. Basis of Design: TremSEAL Pro

5. Reglet Joint Sealant
   a. One-part, bituminous polyurethane sealant.

6. Primer:
   a. An asbestos free, modified water-based asphalt primer
   b. Basis of Design: Tremco Tremprime WB.

7. Flashing tape for top edge of base flashing
   a. A flexible, non-drying, butyl-based, gasket-forming sealant tape.
   b. Basis of design: Tremco TF Tape

8. Reinforcement membrane:
   a. A non-shrinking, non-rotting, vinyl coated, woven glass mesh.
   b. Basis of Design: Tremco Burmesh - 6”.

2.04 CANT STRIP

A. Structural: Shall be wood (minimum 1 1/2” x 3 5/8”) where used for structural purposes
meeting NRCA, FM Global and Underwriters Laboratory guidelines. Cant shall provide for
a nominal 4” rise above roof surface.

B. Non-structural: Shall be wood fiber (minimum 1 1/2” x 3 5/8”) where used for non-structural
purposes, conforming to ASTM C208 and C209. Cant shall provide for a nominal 4” rise
above roof surface.

2.05 ROUGH LUMBER

A. All wood nailers, structural cants, curbs, and other miscellaneous rough carpentry, shall be
lumber as recommended by NRCA, and Underwriters Laboratory guidelines. Refer to
Specification Section 06 10 50; Miscellaneous Carpentry.

B. Vertical Wall Shimming Material: Shall be one of the following unless otherwise accepted
by Owner’s representative, thickness as required; exterior grade plywood. Proper
selection of material is required to achieve UL guidelines. Refer to Specification Section
06 10 50; Miscellaneous Carpentry.

2.05 FASTENERS

A. Fasteners and fastening plates or bars shall be as recommended by the fastener
manufacturer for the specific application as applicable.
B. Fasteners Engineered to secure insulation, cover boards, base sheets and single ply roofing membrane systems to corrugated steel substrate
   1. Tremco; #15 EHD with Tremco 2.4 inch barbed Seam Plates
   2. Trufast; #15 EHD with Trufast 2.4 inch barbed Seam Plates

B. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head, as manufactured by Rawl Zamac Nailin, or approved equal.

2.06 LEAD JACKS/SHEET LEAD

A. Shall be four pound (4#) lead, and of dimensions required to completely cover existing plumbing stack.

B. Sheet Lead Flashing: Shall be four pound (4#) lead, minimum thirty inches by thirty inches (30" x 30"), used for flashing of internal drains.

2.07 PIPE SUPPORTS

A. Pipe support system shall be a prefabricated, engineered support system designed specifically for use on roofing without adhesive, roof penetrations, flashings, or damage to roofing system. Supports shall be as recommended by manufacturer as suitable for size and type of conduit or pipe being supported. Shall be as manufactured by Advanced Support Products, Inc., or approved equal.

   1. Base shall be seventeen inches (17") circular base, injected molded polypropylene, with 227 square inches of surface on bottom, designed for weight disbursement;
   2. Dimensions shall be three inches (3") high by seventeen inches (17") in diameter, with molded insert for square tubing and two threaded rod couplings molded in.
   3. Frame shall be pre-galvanized zinc coated 12 gauge channel meeting ASTM A653.
   4. Hangers shall be clevis and/or band type as per pipe requirements.
   5. Accessories shall consist of cadmium plated threaded rods, clamps, nuts, bolts, and washers.
   6. Rollers shall be non-binding heavy duty SBR rubber.

2.08 TERMINATION/PRESSURE BARS

A. Aluminum strip shall be extruded channel bar with a mill finish, height to be one inch (1"), thickness to be 0.25" ± 0.1", leg height to be one-fourth inch (1/4") top and bottom, leg angle to be ninety degrees (90°), for perimeter and curb anchorage, having predrilled holes six inches (6") on center, as manufactured by Olympic Fasteners, or approved equal.

2.09 ROOF WALKWAY MEMBRANE

A. Walktread: Mineral-surfaced asphalctic composition panels, factory formed, nonporous, with a slip-resisting surface texture, manufactured specifically for adhering to built-up roofing as a protection course for foot traffic:
   1. Thickness: ½ inch
   2. Basis of design: Tremco TremTred.
2.10 TERMINATION/PRESSURE BARS

A. Aluminum strip shall be extruded channel bar with a mill finish, width one inch (1"), thickness 0.100" ± .008", leg height one-fourth inch (1/4") top and bottom, leg angle ninety degrees (90°), for perimeter and curb anchorage, having predrilled holes six inches (6") on center, as manufactured by Olympic Fasteners, or approved equal.

2.11 SELF-ADHERING UNDERLAYMENT FOR TEMPORARY WATERPROOFING

A. A premium heavyweight, minimum 60 mil, self-adhering underlayment, to use as an ice and water shield.

2.12 DELIVERY AND STORAGE

A. All materials shall be delivered with appropriate carton and can labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

2.13 PRECAUTIONS

A. Some of the indicated materials are extremely flammable and/or toxic. Use precautions indicated on can and carton labels.

2.14 MISCELLANEOUS MATERIALS

A. Other materials shall be as specified or of the best grade for the proposed use as recommended by the manufacturer.

2.15 WALL TREATMENT AND COATING MATERIALS

A. Primer for previously coated walls above roof membrane:
   1. Acrylic polymer emulsion, stain resistant, fast drying, flexible base primer for elastomeric latex coatings.

B. Coating for previously coated walls above roof membrane:
   1. Acrylic polymer emulsion wall coating with fiber reinforcement.
   2. Tinted to match existing.
   3. Basis of Design: Tremco Solargard HY-BUILD

2.16. ROOF HATCH

A. Shall be pre-manufactured hatch, as manufactured hatch, as manufactured by Bilco Company, or approved equal. Size shall match existing opening.
   1. Material: Aluminum with 11-gauge cover and frame.
   2. Cover: Break-formed, hollow-metal design with three inch (3") concealed fiberglass insulation, three inch (3") beaded, overlapping flange, fully welded at corners, and internally reinforced for 40 psf live load.
3. Curb: Sixteen inches (16") in height with integral cap flashing. One inch (1") fiberboard insulation, fully welded at corners, and three and one-half inches (3-1/2"") mounting flange with seven-sixteenths inch (7/16") holes provided for securing frame to the roof deck.

4. Gasket: Extruded EPDM rubber gasketed permanently adhered to cover.

5. Hinges: Heavy-duty pintle hinges with three-eighths inch (3/8") Type 316 stainless steel hinge pins.


7. Lift Assistance: Compression spring operators enclosed in telescopic tubes with automatic hold-open arm with grip handle release.

8. Finish: Aluminum with mill finish, or as selected by Project Manager/Architect.

9. Hardware: Aluminum with engineered compression spring tubes. Steel compression springs with electrocoated acrylic finish and Type 316 stainless steel hinges. All other hardware is zinc plated/chromate sealed.

10. Roof hatch must have a minimum R-value of 12.

11. Provide Bil-Guard roof hatch guardrails, as manufactured by Bilco, or approved equal.

12. Provide Ladder-UP safety post by Bilco or approved equal.

PART 3 - EXECUTION

3.01 REFERENCE

A. In the instance of a conflict between these specifications and those of the manufacturer and/or current NRCA, Underwriters Laboratory, and IBC guidelines, the more stringent specifications (better quality or greater quantity of work) shall take precedence.

B. The manufacturer’s Technical Specifications and current NRCA, Underwriters Laboratory and IBC guidelines shall be considered a part of this specification and shall be referred to for general application procedures and recommendations.

C. Application of materials shall be in strict accordance with the manufacturer’s recommendations and current NRCA, Underwriters Laboratory and IBC guidelines, except where more stringent requirements (better quality or greater quantity of work) are shown or specified.

D. General Installation:

1. Comply with governing local, state, and federal regulations, safety standards, and codes.

2. Protect adjacent areas with canvas tarpaulin or other durable materials.

3. Contractor shall prevent overspray and be responsible for parking lot areas and/or adjoining areas not part of this contract.

4. Prepare surfaces according to manufacturer’s or applicator’s published instructions.

   All metal that is to receive bitumen, or come in contact with bitumen or adhesive, shall be first primed with appropriate primer. Any prefinished galvanized sheet steel that is to receive bitumen, or come in contact with bitumen or adhesive, shall be scored, scuffed or abraded before receiving primer application.

5. Use cleaning materials or primers necessary to render an acceptable surface/substrate.

6. All surfaces/substrates shall be clean and dry prior to application of materials.
7. Prior to application of felts and membrane, all foreign matter, gravel, etc., shall be removed from the insulation and/or substrate. Gravel or debris between the insulation/substrate and plies is not acceptable.

8. Prior to application of flashing membranes, substrate shall be clean and free of any previously installed roofing materials. Contractor shall ensure that all components of substrate be structurally sound before application of flashing materials.

9. Ambient temperature shall be 40°F and rising.

10. The underlayment plies and field membranes are to be laid in the direction of maximum roof slope, working from bottom of slope toward ridge.

11. Wrinkles, buckles, kinks, and fishmouths are not acceptable when laying felts and membranes.

12. Dry voids of felt on felt or membrane on membrane are not acceptable.

3.02 ROUGH CARPENTRY

A. Nailers shall be installed according to NRCA, Underwriters Laboratory, and IBC guidelines.

B. Wooden nailers shall be installed at gravel stops, drip edges, expansion joints, and on outside perimeter of building.

C. Gravel stop and drip edge nailers shall be the same height as the new LWIC insulation being installed where required.

D. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced.

E. Expansion joint nailers shall extend upward a minimum of eight inches (8") above finish roof height.

F. Where parapet wall exists, specified vertical wall shimming material shall be installed beginning at roof height up to a minimum of twelve inches (12") above finished roof surface, or as detailed, to provide substrate for horizontal termination of roof to wall flashing system.

G. Any lumber or shimming required for attachment, or to make material flashing flush or level with offsets and/or transitions, shall be incorporated in these specifications.

3.03 CANTS

A. Provide 45 degree cant strips (no partials) at all vertical and horizontal surfaces, such as walls, parapet walls, curbs, expansion joints, etc., and as recommended by membrane manufacturer.

B. Cants shall provide a nominal four (4") inch rise above the roof’s surface.

C. Toe of cant shall be level with the surface to receive new roof membrane and in all cases anchored according to NRCA, Underwriters Laboratory, and IBC guidelines.

D. Cant strips shall be installed at the intersection of the deck and all vertical surfaces.
E. If a wood cant is used where insulation exists, cant shall be toe nailed into treated wood nailer the same height as insulation.

3.04 TORCH-APPLIED ROOF MEMBRANE INSTALLATION

A. Install roofing membrane 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: Concrete deck.
2. Base Ply Sheet: One.
   a. Application Method: Mechanically fastened.
3. Inner Membrane Sheet: One.
4. Granular-Surfaced SBS-Modified Asphalt Cap Sheet:

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

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

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

1. Provide tie-offs at end of each day’s work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new and existing roofing.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove temporary plugs from roof drains at end of each day.
4. Remove and discard temporary seals before beginning work on adjoining roofing.

3.05 BASE-PLY SHEET (ANCHOR SHEET) INSTALLATION

A. Loose lay base sheet, allowing for a minimum of 5" shingle lap and a 6" end laps. Mechanically fasten base sheet to substrate at lap with specified mechanical fasteners at 6" on center. Allow for additional row of fasteners at center of sheet 6" on center. Adhere shingling lap with specified adhesive to mechanically fastened base ply at lap. Provide for 6" wide strip of base sheet adhered over center row fasteners with specified Adhesive. Roll base sheet into adhesive with 6" wide roller.

B. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Mechanically fasten to substrate.
3.06 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane 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 cant, installing as follows:
1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
2. Torch apply to substrate in accordance with manufacturer’s written instructions and NRCA CERTA guidelines.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Install roofing membrane sheets so side and end laps shed water. Completely bond and seal laps, leaving no voids.
1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

3.07 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; secure to substrates according to roofing system manufacturer’s written instructions, and as follows:
1. Extend base flashing up walls or parapets a minimum of 12 inches (300 mm) above built-up roofing and 6 inches (150 mm) onto field of roof membrane.
2. Prime substrates with asphalt primer if required by roofing system manufacturer.
4. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive at rate required by roofing system manufacturer. Seal joints in flashing sheet. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
5. Flashing Sheet Application: Torch-apply flashing sheet to substrate.

B. Seal top termination of base flashing with a metal termination bar.

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

D. Roof Drains: Set 30 by 30 inch (760 by 760 mm) square metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of 6 inches beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
1. Install stripping according to roofing system manufacturer’s written instructions.

3.08 WALKWAY INSTALLATION
A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer’s standard size according to walkway pad manufacturer’s written instructions.
   1. Sweep away loose aggregate surfacing.
   2. Set walkway pads in cold-applied adhesive.

3.09 WALL TREATMENT AND COATING INSTALLATION

A. Wall coating at previously coated walls above the roof membrane:
   1. Pressure wash and clean concrete wall to be coated as noted on plans.
   2. Provide repairs to cracks in masonry wall larger than 1/8” with urethane caulk.
   3. Masonry walls are to be primed with specified primer. Refer to product data for coverage rates.
   4. Apply three (3) coats of the specified elastomeric wall coating as recommended by the manufacturer in owner selected color.

3.10 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer’s technical personnel to inspect roofing installation at commencement, through-out the installation as described above and upon completion.
   1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

B. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.
   1. Additional testing and inspecting, at Contractor’s expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.11 PERIMETER FASTENING

A. Wood nailers are required for perimeters and/or drip edges. Field membrane and all plies shall be mechanically fastened on the vertical face of nailer, twelve inches (12”) on center maximum or as necessary to meet wind-uplift requirements and Windstorm Certification.

3.12 PROJECTION FLASHINGS

A. Projection Flashings:
   1. Plumbing Vents: Soil vent stack pipes shall receive lead flashings installed in accordance with practices set forth in the NRCA Roofing Manual. The lead shall be carried up and over the top of the stack and crimped down into the pipe to form a watertight seal. Projections shall be flashed as recommended by the roof membrane manufacturer. Strip-in flange with specified stripping ply and cap with finish ply. Provide flashing membrane target.
   3. Prime all flanges prior to setting in a bed of mastic. Install to manufacturer’s specifications. Provide tapered edge strips around base as required. Cricket up-side slope.
5. Prime all metal prior to setting mastic. Install to manufacturer’s specifications.

3.13 METAL EDGE FLASHINGS

A. An NRCA-approved pre-manufactured fascia system shall be installed in strict accordance with published instructions to meet ES-1.

B. Install the wood blocking, insulation, coverboard and field base membrane ply as specified.

C. Prime the top and bottom of the flange of the metal edge with asphalt primer and permit to dry.

D. Install a minimum four inch (4") wide bed of SBS plastic cement where the metal flange will seat. Fasten the metal flange three inches (3") on center staggered.

E. Cut a polyester reinforced section of flashing strip that is wide enough to lap three inches (3") onto the field base membrane ply and flash in all of the fastener heads of the fasteners used to anchor the edge metal.

F. Install field cap membrane ply so that it butts to the edge of the metal or the base of the gravel stop.

G. Apply a three-eighths inch (3/8") round bead of manufacturer’s SBS plastic cement to the outside edge of the cap sheet or as required by the manufacturer.

3.14 EXPANSION JOINT DETAILS

A. Existing expansion joints shall be replaced with curved expansion joints which extend a minimum of eight inches (8") above the finished roof surface. New expansion joint cover shall be fabricated of sheet metal in accordance with NRCA or SMACNA details and flashed in accordance with roofing material manufacturer’s recommended procedures. Refer to specifications section 07 62 00 for more information.

3.15 MEMBRANE PROTECTION

A. Where equipment pads, wood sleepers, or walkway slabs are to be installed over the roofing membrane, an additional layer of the roofing membrane shall be installed between the roofing membrane and the pad, sleeper, or slab. Due caution shall be exercised to prevent roofing membrane damage during placement. Where required, membrane shall be welded to field membrane to prevent slippage.

3.16 ROOF WALKWAYS

A. Install manufacturer’s walk pad on each side of each air-handling/mechanical unit on the roof, or as shown on drawings in accordance with the manufacturer’s recommended procedures.

B. Walkways may consist of an additional layer of cap membrane installed by heat welding.
C. Sections of walkway should be no longer than ten feet (10') in length and gapped four inches (4") from adjoining sections.

3.17 PIPING/CONDUIT

A. Piping/conduit shall be raised to NRCA recommended heights, and new supports furnished. Permanent supports shall be installed upon pads approved by membrane manufacturer. Coordinate work with Owner’s representative.

B. All gas lines, shall be coated with industrial grade yellow paint.

3.18 PIPE/EQUIPMENT SUPPORTS

A. All gas lines, piping, and conduit must be supported on specified stands or hangars.

B. Service lines three inches (3") and over must be supported on new pipe roll stands.

C. Designated pipe/equipment supports shall be removed and replaced with new.

D. Verify that roof surface is smooth and clean to extent needed to receive materials. Surface shall be cleaned by removing any loose gravel and any foreign matter.

E. Install support systems in accordance with manufacturer’s instructions and approved shop drawings. Accurately locate and align pre-fabricated pipe supports in locations specified as per approved shop drawings. Pipe supports shall be placed not to exceed ten feet (10’) on center.

F. New supports shall be attached to the pipe with oversized strapping.

G. New supports shall be set on a double layer of membrane, adhered to the roof surface using manufacturer’s recommended Structural Adhesive/Sealant.

3.19 DRAINS

A. All broken or missing roof drain strainers shall be replaced. All drains shall receive new lead and new roof membrane installed in accordance with the detailed drawing. Existing drains shall be raised to accommodate new insulation thickness. Every drain shall be inspected after roofing to ensure proper seal to leader line.

B. Insulation shall be tapered or feathered at drains and scuppers to provide proper drainage (if applicable).

C. Sump to drain shall be (8’x8’) minimum.

3.20 DRAIN FLASHINGS

A. Build a sump to the drain and create a smooth transition by installing tapered insulation around the drain. The slope of the drain sump shall not exceed one inch (1") per horizontal foot (8%). The drain sump should be (8’x8’) minimum.
B. Apply asphalt primer to the top of the drain bowl where the clamping will seat and permit to dry.

C. Install a minimum eight inch (8") wide bed of SBS plastic cement onto the drain flange and out onto the insulation prior to embedding the field base membrane ply into the cement. After embedding the field base membrane ply, apply another bed of SBS plastic cement on top of the base ply prior to the application of the primed drain lead flashing.

D. Install the base sheet so that the side lap for the initial base sheet joint occurs down the center of the drain bowl. Install the base sheet so that end laps do not occur within the drain sump.

E. The base membrane ply, lead drain flashing, reinforcing and membrane plies extend under the clamping ring a minimum of one inch (1"). The lead is turned down into the bowl a minimum of one inch (1").

F. Install the field cap membrane ply so that the side laps do not occur under the clamping ring. Install the field cap membrane ply so that end laps do not occur within the drain sump.

G. Install the clamping ring and drain bolts to provide continuous compression between the top of the drain bowl and the clamping ring.

3.21 ROOF HATCH

A. Install hatch per manufacturer’s guidelines.

B. Provide required structural members to properly install the roof hatch, safety railing, and safety post.

3.22 TEMPORARY CLOSURES

A. Temporary closures must be used to protect the finished roof system from infiltration of water during inclement weather while the roof is under construction.

B. All temporary tie-in material must be completely removed prior to continuing installation of the new roofing system.

C. Temporary closures shall be installed according to accepted roofing practices as outlined in the NRCA Roofing Manual and acceptable to the membrane manufacturer.

3.23 OVERNIGHT SEAL

A. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.

B. Installation shall be performed according to accepted roofing practice as outlined in the NRCA Roofing Manual.
3.24 PROTECTION

A. Finished roof areas shall be protected from damage by the contractor during construction.

END OF SECTION 07 52 16
SECTION 07 62 00
SHEET METAL AND MISCELLANEOUS ACCESSORIES
FOR ADHERED MULTI-PLY ROOF SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Provide flashing and sheet metal components for moisture protection.
   2. Related accessories.

B. Related Sections include the following:
   1. Division 6 Section "Miscellaneous Carpentry" for wood nailers, curbs, and blocking.
   2. Division 7 Section "SBS Modified Bituminous Membrane Roofing" for installing sheet metal flashing and trim integral with roofing membrane.

1.02 SUBMITTALS

A. Product Data:
   1. Submit shop fabrication drawings, product data and mockups of all sheet metal.

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers in satisfactory use in similar service for five (5) years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer’s instructions.


1.04 WARRANTIES

A. Manufacturer’s Product Warranty: Submit manufacturer’s standard limited product warranty signed by the manufacturer’s authorized official, guaranteeing to correct failures in product which may occur during the warranty period, without reducing or otherwise limiting any other rights to correction which the Owner/Project Consultant may have under the contract documents. Failure is defined to include product failure which leads to interruption of a watertight installation. Correction may include repair or replacement of failed product.

B. Contractor’s Warranty Period: For roofing flashing and sheet metal, provide a written warranty which shall warrant work to be free of leaks and defects in materials and workmanship for two (2) years, starting from date of substantial completion.
C. Defects of the sheet metal occurring during the warranty period shall be promptly corrected by the contractor, and defects of the roofing shall be promptly corrected by the manufacturer at no additional cost to the Owner. Upon notification from the Owner or the Owner’s representative that evidence of a defect exists, the responsible party shall immediately inform the Owner’s representative of the date on which corrective work will be scheduled and shall notify the Owner’s representative when the corrective work has been completed.

PART 2 - PRODUCTS

2.01 SHEET METAL MATERIAL

A. Stainless Steel: ASTM A240/A240M, Type 316. Min. 24 gauge unless otherwise noted.
   1. Finish: No. 3 Polish

B. Sheet Lead: QQ-L-201, Grade B.

C. All existing sheet metal shall be replaced with new metal as specified.

2.02 FASTENERS

A. Fasteners shall be same metal as flashing/sheet metal, or other non-corrosive metal as recommended by sheet manufacturer for the specific application. Match finish of exposed heads with material being fastened.

B. Fasteners and fastening plates or bars shall be listed in the FM Global Approval Guide.

C. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless-steel nail, one-piece unit, flat head.

D. Screws: Self-taping, stainless-steel sheet metal type with neoprene washer, as appropriate.

E. Pop Rivets: Full stainless-steel Series 42 or 44, as appropriate.

F. Continuous Clip: Concealed hold-down clip type; of same materials as coping, gravel guard, sized to suit application. Use a continuous clip, minimum 22-gauge (or as required for ES-1 compliance) 316 SST.

2.03 RELATED MATERIAL

A. Plastic Cement: FS SS-C-153, cutback asphalt type as approved by roofing manufacturer.

B. Solder for Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

C. Solder: Solder for Lead: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead.

D. Sealant (for Sheet Metal): One-component polyurethane, conforming to requirements of FS TT-S-230C, non-staining and non-bleeding.
E. Miscellaneous Materials:
   1. Splash Blocks: Concrete, 3000 psi, 28 days. Provide and install with protection pads at all downspouts. Dimensions shall be a minimum eighteen inches wide by thirty-six inches long (18” x 36”).
   2. Metal Accessories: Provide and install sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size, and gauge required for performance.

F. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, substrates are smooth and clean and nailing strips located.

B. Verify membrane termination and base flashings are in place, sealed and secure.

C. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Field measure site conditions prior to fabricating work. Provide all shop drawings and mock-ups one month prior to installation to the Owner/Project Consultant for approval.

B. Install starter and edge strips and cleats before starting installation.

3.03 FABRICATION - GENERAL

A. Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual", NRCA Roofing and Waterproofing Manual (Fifth Edition), ANSI/SPRI ES-1, and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer’s instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Fabricate edge metal/fascia, gutters/downspouts, counterflashings, expansion joints, and copings with new galvanized sheet metal as specified. Fabricate edge metal and fascia to size and dimensions as indicated on the drawings unless otherwise noted. Fabricate light metal coping, gutters and downspouts as indicated.
C. Form sheet metal on bending brake.
D. Form materials with straight lines, sharp angles and smooth curves.
E. Fold back edges on concealed side of exposed edge to form hem (1/2" minimum).
F. Weld or solder joints on parts that are to be permanently and rigidly assembled.
G. Limit single-piece lengths to ten feet (10').
H. Fabricate corner pieces with eighteen-inch (18") extensions, mitered and sealed by forming as one piece.
I. Where installing flashing directly to masonry or dissimilar materials, backpaint with bituminous paint
J. Install new metal rooftop projections. New rooftop projection details shall be as recommended in NRCA or SMACNA handbooks. All rooftop projections shall be cleaned, all joints sealed, and painted with a rust inhibitive paint.
K. All sheet metal shall be sealed and watertight.
L. Metal work should be secured so as to prevent damage from buckling or wind. Where clips are shown, these are to be continuous.
M. All metal to receive bitumen or adhesive shall be first primed with asphalt primer.
N. All prefinished metal shall be sanded and/or abraded prior to receiving primer.
O. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.
P. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

3.04 INSTALLATION

A. General: All sheet metal termination to vertical wall shall have a through-wall with receiver installed on masonry walls or prefabricated "Z" bar flashing pre-installed to fluid applied wall finished prior to installation of sheet metal termination. This applies to edge metal, base flashing closures and all vertical surface intersections. Refer to NRCA, SMACNA, and metal manufacturer’s guidelines.

B. Edge Metal/Fascia:
1. Shall be minimum 24-gauge 316 Stainless Steel, No. 3 Polish Finish; installed with expansion joints, ten feet (10') on center, one-fourth inch (1/4") expansion leeway, with a cover plate.
2. Secure metal flashings per specifications.
3. Lock seams and end joints.
4. Form sections identical to profiles as shown or approved similar, to match existing building.
5. Fabricate corner pieces with minimum eighteen-inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
6. Hem exposed edges one-half inch (1/2") minimum.
7. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
8. Integrate flashing in a manner consistent with detailing.
9. Provide and install continuous clip around perimeter.
10. Shall be fabricated in accordance with all SMACNA provisions.

D. Coping:
1. Install new pre-manufactured metal coping for a permanent watertight installation.
2. All coping shall be pre-manufactured to include low profile standing metal seam to meet ES-1 requirements.
3. Shall be minimum 24-gauge 316 Stainless Steel, No. 3 Polish Finish; installed in ten foot (10') sections maximum.
4. Vertical fascia shall extend minimum two and one-half inches (2-1/2") or be minimum one and one-half inches (1-1/2") below bottom of nailer, whichever is greater.
5. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
6. Hem exposed edges one-fourth inch (1/4") minimum.
7. Provide and install continuous clip, minimum 22-gauge.
8. Shall be fabricated in accordance with published details.

E. Expansion Joint Field and at Wall:
1. Shall be minimum 24-gauge 316 Stainless Steel, No. 3 Polish Finish; as outlined by details, and be in full compliance with these specifications.
2. Lock seams and end joints.
3. Fabricate corner pieces with minimum eighteen-inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
4. Hem exposed edges one-fourth inch (1/4") minimum.
5. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
6. Integrate flashing in a manner consistent with detailing.
7. Provide and install continuous clip, minimum 22-gauge or one gauge thicker than flashing.
8. Shall be fabricated in accordance with published details.

F. Counterflashing:
1. Provide minimum 24-gauge 316 Stainless Steel, No. 3 Polish Finish; and install new metal counterflashing as required for a permanent watertight installation.
2. Saw cut brick mortar joint to receive friction fit reglet and removable counterflashing as detailed in SMACNA Figure 4-4E.
G.  Scuppers, Overflow Scupper, Collector Head and Downspout:

1.  Fabrication:
   a)  Fabricate scuppers, overflow scuppers, collector heads and downspouts of minimum 24-gauge 316 Stainless Steel, No. 3 Polish Finish; and of profile and size indicated, taking care that the roof drain leader fits properly into the back of the collector head.  Seal the pipe to the collector head for watertightness.
   b)  Field measure site conditions prior to fabricating work.
   c)  Fabricate with required connection pieces.
   d)  Fabricate section square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
   e)  Hem exposed edges of metal.
   f)  Form and seal all metal joints; provide for expansion joints per SMACNA.

2.  Installation:
   a)  Install collector head, downspout, and accessories.
   b)  Join lengths with seams pop riveted and sealed watertight. Flash and seal collector head to downspouts and accessories.
   c)  Seal all metal joints watertight for full metal surface contact.
   d)  Collector Head:  SMACNA style profile; submit detail for approval.
   e)  Downspouts:  Rectangular profile. Seal all joints, four inches by six inches (4" x 6").
   f)  Support Brackets, Joint Fasteners:  Profiled to suit gutters and downspouts.
   g)  Anchorage Devices:  SMACNA requirements.  Type recommended by fabricator.
   h)  Collector Head Support:  316 SST No. 3 Polish Finish.
   i)  Downspout Supports:  Straps, 316 SST No. 3 Polish Finish.

H.  Pitch Pans:

1.  Install pitch pans of 24-gauge, 316 stainless steel as specified according to NRCA standards, minimum of six inches by six inches (6" x 6").

2.  Pitch pans shall be fabricated to a minimum of six inches (6") above the finished roof membrane. The top vertical edge of the metal must be folded over to the inside of the pitch pan. The pitch pan flange must be a minimum of three and one half inches (3.5") wide in contact with the horizontal roof plain or field of roof membrane.

3.  Approved sealant shall be applied under the pitch pan flange in accordance to the manufacturer’s requirements prior to securing the flange to the deck with approved fasteners a minimum of 4" on center.

4.  Projection (maximum of one) enclosed in pitch pans shall be cleaned in any manner suitable and coated with a rust inhibitive coating as approved by the Owner/Project Consultant. Coating shall be allowed to dry prior to pitch pan fill.

5.  Base of pitch pans shall be filled with grout or cementitious binder to proper height and allowed to cure.

6.  Top finish fill shall be self-leveling, one-part urethane, with minimum fill to top of the pitch pan sides.

7.  Strip the metal flange of the pitch pan to the field membrane with one strip of flashing membrane. The flashing membrane must extend from the outer edge of the pitch pan flange onto the field membrane a minimum of three inches (3") and butt to the vertical sides of the pitch pan on all 4 sides.  The flashing membrane shall be adhered to metal pitch pan and to the field membrane.
I. Bonnets/Hoods:
   1. Fabricate and install above all pitch pans, where necessary, or reinstall as applicable, metal bonnets over all pitch pans, NO EXCEPTIONS.
   2. Bonnets/Hoods shall be manufactured with 316 stainless steel metal. Where non-compatible metal surfaces come in contact provide appropriate separation material and sealant to prevent electrolysis corrosion.
   3. On beams and other steel, weld in place bonnets fabricated from one-fourth inch (1/4") steel plate.
   4. Draw band bonnets fabricated from 22-gauge stainless steel may be used on circular projections.

3.05 FINISH

A. Backpaint concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals. Exposed surfaces to be 316 Stainless Steel No. 3 Polish Finish.

B. Metal surfaces must be properly prepared by removing all oil, grease, and/or protective mill coatings by solvent cleaning surface in accordance with SSPC-SP1, and according to manufacturer’s recommendation.

END OF SECTION 07 62 00
PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:
   1. Throughout the Work, seal and caulk joints as described herein to provide and maintain watertight and airtight continuous seals.
   2. This section includes, but is not limited to, providing joint sealants to be in the following areas:
      a) Door and window frames to wall surfaces
      b) Exterior openings
      c) Perimeter soffits to wall surfaces
      d) Control and expansion joints in masonry and concrete walls
      e) Parapet cap copings and counterflashings at roof conditions
      f) Penetrations thru exterior walls of plumbing, piping, service lines, etc.

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who have successfully completed a minimum of three (3) projects in the last five (5) years of similar type and scope as the project herein. The workmen shall be thoroughly trained and experienced in joint sealant applications and completely familiar with the specified requirements and methods needed for the proper performance of the work of this section.

B. Joint sealer products shall be obtained from a single manufacturer for each product required.

C. Job Site Testing:
   1. All joint sealants shall be field tested for proper adhesion to the joint substrates prior to installation. Do not proceed with the work until job site tests have been approved by the Project Consultant.
   2. Locate and proved test joints for each type of joint sealant, and substrate as directed by the Project Consultant.
   3. Acceptable test joints will be used as the standard for all joint sealant work on the project.
   4. Sealants which fail to adhere to the substrates shall be removed and replaced at no extra cost to the Owner.

1.03 SUBMITTALS

A. Comply with pertinent provisions of General Requirements.

B. Product Data: Within five (5) calendar days after the Contractor has received the Owner’s Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section;
   2. Manufacturer’s specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation procedures which, when approved by the Project Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

C. Samples: Accompanying the submittals described above, submit samples of each sealant, each backing material, each primer and each bond breaker proposed to be used. Include color samples of full standard project color range.

1.04 PRODUCT HANDLING

A. Do not retain at the job site material which has exceeded the shelf life recommended by its manufacturer.

B. Store products on site in compliance with the manufacturer's recommendations and as necessary to prevent damage or deterioration to the materials.

PART 2 – PRODUCTS

2.01 GENERAL

A. Manufacturers listed include those known to produce the indicated category of prime material and shall be as listed.

B. Select materials for compatibility with surfaces and other indicated exposures, and except as otherwise indicated select modulus of elasticity, hardness, or grade recommended by manufacturer for each application indicated.

C. Provide colors to match existing, as selected by Owner/Architect/Project Manager from manufacturer's standard colors.

2.02 APPROVED MANUFACTURERS

A. BASF (formerly Sonneborn Building Products Div.); Chemrex.

B. Dow Corning

C. GE Silicones

D. Pecora Corporation

E. Tremco

F. Or approved equal

2.03 SILICONE SEALANT

A. Low-Modulus Nonacid-Curing Silicone Sealant, Type I:

1. Products:
   a. Dow Corning; 790.
   b. GE Silicones; Silpruf
   c. Pecora Corporation; 890.
   d. Tremco; Spectrem
   e. BASF (formally) Sonneborn Building Products Div., ChemRex Inc.; Omniseal.

2. Type and Grade: S (single component) and NS (non-sag).

4. Additional Movement Capability: Capable of 100 percent movement in extension and 50 percent movement in compression when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719.

5. Exposure: Use NT (nontraffic).

6. Substrates: Uses M, G, A, and, as applicable to joint substrates indicated, O.

7. Non-staining to porous substrates when testing per ASTM C 1248 for substrates indicated.

B. Medium-Modulus Neutral-Curing Silicone Sealant, Type 2:

1. Products:
   a. Dow Corning; 791.
   b. Tremco; Spectrem 2.

2. Type and Grade: S (single component) and NS (non-sag).


4. Exposure: Use NT (nontraffic).

5. Substrates: Uses M, G, A, and, as applicable to joint substrates indicated, O.

6. Non-staining to porous substrates when testing per ASTM C 1248 for substrates indicated.

C. Mildew-Resistant Silicone Sealant, Type 3:

1. Products: Dow Corning; 786 Mildew Resistant.
   a. GE Silicones; Sanitary 1700.
   b. Pecora Corporation; 898 Silicone Sanitary Sealant.
   c. Tremco; Tremsil 600 White.

2. Type and Grade: S (single component) and NS (nonsag).


4. Exposure: Use NT (nontraffic).

5. Substrates: Uses G, A, and, as applicable to joint substrates indicated, O.

D. Multicomponent Non-sag Urethane Sealant, Type 4:

1. For joints not subject to traffic and requiring additional movement capability, provide the following:
   a. Products:
      1). Pecora Corporation; Dynatrol II. 2).
      Sika Corporation; Sikaflex -2c NS. 3).
      Tremco; Dymeric 240FC.
   b. Type and Grade: M (multicomponent) and NS (nonsag).
   c. Class: 25.
   d. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719.
   e. Exposure: Use NT (nontraffic).
   f. Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

2. For joints not subject to traffic, Type 5:
   a. Products:
      1). Bostik Inc.; Chem-Calk 500.
      2). Tremco; DYMeric.
   b. Type and Grade: M (multicomponent) and NS (nonsag).
   c. Class: 25.
d. Exposure: Use NT (nontraffic).

e. Substrates: Uses M, G, A, and, as applicable to joint substrates indicated, O.

E. Single-Component Non-sag Urethane Sealant, Type 6:
1. For joints subject to traffic and not subject to traffic, provide the following:
   a. Products:
      1) Sika Corporation; Sikaflex-1a.
      2) Sonneborn Building Products Div.; ChemRex Inc.; NP 1.
   b. Type and Grade: S (single component) and NS (nonsag).
   c. Class: 25.
2. Exposure: Use NT (nontraffic).
3. Substrates: Uses M, G, A, and, as applicable to joint substrates indicated, O.
4. For joints not subject to traffic, provide the following:
   a. Products:
      1) Bostik Inc.; Chem-Chalk 900. 2).
      2) Pecora Corporation; Dynatrol I. 3).
      3) Tremco; DyMonic.
   b. Type and Grade: S (single component) and NS (nonsag).
   c. Class: 25.
   d. Exposure: Use NT (nontraffic).
   e. Substrates: Uses M, A, and, as applicable to joint substrates indicated.

F. Single-Component Pourable Urethane Sealant, Type 7
1. Products:
   b. Pecora Corporation; NR-201.
2. Type and Grade: S (single component) and P (pourable).
4. Exposure: Use T (traffic) and NT (nontraffic).
5. Substrates: Uses M, G, A, and, as applicable to joint substrates indicated, O.

2.04 SEALANT BACKER ROD

A. General: Provide sealant backings of material and type 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.

B. Cylindrical Sealant Backings: ASTM C 1330, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
1. Type: C O, or B.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance. Provide single backing to completely fill the joint per manufacturer’s recommendations.
D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

PART 3 - EXECUTION

3.01 REFERENCE

A. The manufacturer’s Technical Specifications shall be considered a part of this specification and should be referred to for more specific application procedures and recommendations.

B. It is the intent of the specification that the new work will provide a watertight facility. The following specifications describe the minimum acceptable standards of construction and finish.

3.02 PREPARATION/PROTECTION

A. Protect all window glass, aluminum, other metal, and painted surfaces from exposure to cleaner using polyethylene or other proven protective material. Coordinate site preparation for diversion and/or protection of pedestrians, and auto traffic, and protection of adjacent shrubs and plants. Beware of wind drift, and suspend work if damage is likely to occur on surrounding surfaces, auto and pedestrian traffic and plantings.

3.03 PRECAUTIONS

A. Applicators shall wear goggles, rubber gloves, plastic or rubber suits, etc., so as to avoid splash to skin and eyes. Handle and store in rubber or plastic containers. Staging shall be well maintained and equipped with steel cable. Nylon, cotton, or hemp roping is not acceptable.

B. Materials that contain blended solvents should be handled accordingly. Do not use near fire or extreme heat and provide good ventilation to avoid build-up of solvent fumes. When applying to confined surfaces, applicators shall wear approved cartridge-type respirators and provide good cross-ventilation. When applying to exteriors of occupied buildings, all exterior air-conditioning vents shall be covered during application, after coordinating with Plant Engineer.

3.04 SURFACE PREPARATION

A. Contractor shall clean all surfaces of vertical wall and masonry coping of the facility, and all areas of the facility, including windows, doors, etc. upon completion.

B. Water blasting, sandblasting or hand method required to clean parapet wall coping substrate can be used. It shall be the responsibility of the contractor to determine the method of cleaning based upon adjoining materials, site conditions, and manufacturer’s requirements.
C. Should water blasting be used, allow time to dry, and test for dryness before further application is done.

D. Pressure clean (minimum 1200 psi) to remove all dust, dirt, grease, oil, loose particles, laitance, foreign materials, peeling and defective coatings, chalk, etc. Allow surface to dry before proceeding.

E. Mildew and fungus must be removed from the surfaces before application of sealants/coating system to prevent subsequent growth. Follow manufacturer’s directions for proper surface preparation.

F. Remove loose particles and foreign matter. Remove grease, oil, or tar with a solvent, effective alkaline cleaner, or detergent as instructed by coating manufacturer. Contractor shall clean all contaminants and residue from brick wall surface entirely.

G. Surfaces which are not clean, i.e., surfaces where the pores and capillaries may be clogged with oils, dirt, dust, curing compound and/or other coatings, etc., must be cleaned sufficiently.

H. Metal surfaces may be cleaned by Commercial Blast Cleaning (SSPC-SP6), or by hand or power tool cleaning (SP2-SP3), as required to accept primer. It shall be the responsibility of the contractor to determine the method of cleaning based upon adjoining materials, site conditions, and manufacturer’s requirements.

3.05 CLEANING AND PREPARATION FOR CAULKING/SEALANT

A. All joints to be caulked shall be thoroughly cleaned before caulkling. Remove all existing sealant and backer materials, and remove all foreign matter such as dust, surface dirt, oil, grease, wax, form-release agents, curing compounds, bitumens, laitance, protective coatings, and water. The presence of moisture will cause gassing before the sealant achieves ultimate cure. Existing sealant materials shall be removed by stripping, sawing, cutting, raking, scraping, grinding, abrading, chipping, blast-cleaning, dissolving, or whatever combination of such methods may be necessary or required, to the extent that adhesion of new sealants can be guaranteed. New sealants must be applied to dry, clean, original base surfaces. Old caulking shall be cut out, with binding sides being scraped clean and wiped with Toluene. All non-rusted steel and iron shall be wire brushed and wiped with Toluene. All rusted steel and iron shall be cleaned as per SP2, SP3, or SP6 as applicable, wiped with Toluene and primed.
3.06 INSPECTION

A. During the progress of the work, the contractor shall furnish and make available to the Owner's representative a safe scaffold and operator for use in making visual inspections of the work. At least twenty-four (24) hours before completion of each drop, the contractor shall notify the Owner's representative of the date and time of scheduled completion of the drop and arrange for inspection by the Owner's representative. If after such notification, the Owner's representative waives inspection of a drop, such waiver of inspection shall not relieve the contractor of this responsibility for full compliance with the requirements of the drawings and specifications. Any work rejected upon inspection of a drop shall be immediately corrected by the contractor, before proceeding to the next drop. Inspections shall be scheduled so as not to unnecessarily delay progress of contractor.

B. Contractor shall submit a certificate indicating the number of gallons of waterproofing/coating needed to cover the entire area of work. Indicate the square footage coverage expected per gallon, and the total square footage involved. Do not destroy used containers. As containers are used, store in a place designated by the Owner for audit purposes.

3.07 ELASTOMERIC SEALANTS/CAULKS

A. Contractor shall remove existing sealants, clean and prime as required all joints and install new two-part polyurethane sealant in accordance with manufacturer's instructions, to all vertical wall joints, all control joints, coping joints, roof interior, coping bed joints, lintels, brick shelves, brick reveal, and masonry-to-masonry as required by existing, and all vertical wall penetrations and dissimilar materials.

B. Contractor shall cut all existing wall cracks and seal in compliance with specifications for all stucco substrates as required in all wall substrates.

C. All joints three-eighths inch (3/8") in width shall be cut to a depth of five-eighths inch (5/8"). Joints three-eighths inches to one-half inch (3/8"-1/2") in width shall be cut to a depth of three-fourths inch (3/4"). Joints of three-fourths inch (3/4") in width shall be cut to a depth of one and one-eighth inch (1-1/8"). Remove all loose material beyond cut depth.

D. Use joint filler to achieve required joint depths, to allow sealants to perform properly. Backer rod shall be at least twenty-five percent (25%) greater in size than width of joint.

E. Backer Rods: Install per manufacturer's directions. Where evidence indicates that there might be panel movement (for example, where large splits presently exist in caulked joints, or at corner joints), provide double backer rod installation. DO NOT TWIST-BRAID TWO SMALLER RODS TO MAKE UP ONE LARGE ROD. Contractor shall mark a print of the drawing elevations to show which joints appear to need this treatment, as he removes existing caulking. Backer rod shall be at least twenty-five percent (25%) greater in diameter than width of joint.

F. Primer: Apply primer as required by the manufacturer by brush in a thin, continuous film. Allow primer to dry until "tack" free before installing sealant.

G. Prime All Steel or Iron: Prime all joints as required by sealant manufacturer.
H. **Joint Design:** The width or depth of the joint should not be less than one-fourth inch (1/4”). In joints up to one-half inch (1/2”) wide, the depth of the sealant should be equal to the width. In joints wider than one-half inch (1/2”), but not exceeding one inch (1”), the depth may be maintained at one-half (1/2”). For joints wider than one inch (1”), comply with manufacturer’s recommendations.

I. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.

J. **Joints:** Shall be tooled, free of air pockets, foreign embedded matter, ridges, and sags.

K. Verify that joint-shaping materials and release tapes are compatible with sealant. Use bond breaker where required.

L. **Weeps:** At all horizontal joint applications, install plastic weep tubes at ten feet (10’) on center, as required. Provide weeps in anodized window frames as required.

M. **Window Glazing Preparation:** Old caulking shall be removed completely. Wipe clean surface with a Toluene saturated rag, followed with a dry rag. Remove old caulk from all existing weep holes in metal frame. Test to ensure compatibility of existing to new glazing material. Do not apply if materials are not compatible.

N. Apply silicone to all joints of the window system (metal to glass).

3.08 **CLEANUP**

A. Clean up any overspray from adjacent surfaces with cleaner which will not damage surfaces, as recommended by the manufacturer.

3.09 **FIELD QUALITY CONTROL**

A. Drums containing fluid applied waterproofing shall not be removed from the job site until final completion or until so authorized in writing by the Architect/Consultant/Project Manager.

END OF SECTION 07 92 05
TEXAS A&M UNIVERSITY - CORPUS CHRISTI
EARLY CHILDHOOD DEVELOPMENT CENTER ROOF REPLACEMENT
PROJECT # 1520057
6300 OCEAN DRIVE
CORPUS CHRISTI, TEXAS 78412

VICINITY MAP

STAGING AREA

LIST OF DRAWINGS
R1.01 - OVERALL ROOF PLAN
R1.01w - WIND UPLIFT PLAN
R1.02 - PARTIAL ROOF PLAN - A & G
R1.03 - PARTIAL ROOF PLAN - A, B, & C
R1.04 - PARTIAL ROOF PLAN - D, E, & F
R2.01 - ROOF DETAILS
R2.02 - ROOF DETAILS

PROJECT FOR:
TEXAS A&M UNIVERSITY - CORPUS CHRISTI
EARLY CHILDHOOD DEVELOPMENT CENTER ROOF REPLACEMENT
6300 OCEAN DRIVE
CORPUS CHRISTI, TEXAS 78412

STAGING AREA
GENERAL ROOF NOTES

A. All dimensions shown are in feet (') and inches (""). All roof elevations are single line elevations. Roof slopes are shown as "+" and "-".
B. All roof elevations are single line elevations. Roof slopes are shown as "+" and "-".
C. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

1. Roof Above Shown is for design purposes only. Roof slopes are shown as "+" and "-".
2. Roof Above Shown is for design purposes only. Roof slopes are shown as "+" and "-".
3. Roof Above Shown is for design purposes only. Roof slopes are shown as "+" and "-".

D. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
E. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
F. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

G. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
H. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

I. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
J. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
K. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

L. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
M. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
N. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

O. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
P. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
Q. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

R. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
S. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
T. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

U. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
V. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
W. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".

X. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
Y. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
Z. All roof details are shown in plan view. Roof slopes are shown as "+" and "-".
WIND UPLIFT PLAN

COMPONENT AREA = 50 FT²

1. NEGATIVE ZONE 1 = -72.27 PSF
2. NEGATIVE ZONE 2 = -94.85 PSF
3. NEGATIVE ZONE 3 = -100.50 PSF

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PROJECT FOR:
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EARLY CHILDHOOD DEV. CENTER ROOF REPLC.
6300 OCEAN DRIVE
CORPUS CHRISTI, TEXAS 78412

100%  CONSTRUCTION DOCUMENTS 03.29.2021

3/29/2021
Texas Registered Engineering Firm F-6498
5313 S. McColl Road, Suite A
Edinburg, TX 78539
(956) 800-1776

CHECKED BY: AL

R1.01w
Contractor shall verify all pavement and curb spacing per engineering notes. 

1. **Joist & Deck Installation:** Joists shall be spaced at 12" O.C. and shall be supported at each end. 
2. **Batten & Underlayment:** A minimum of 3/16" underlayment shall be installed under each batten. 
3. **Sealant:** A quality sealant shall be used to seal all joints and penetrations. 
4. **Roof Drainage:** All roof drains shall be installed and tested to ensure proper drainage. 
5. **Lightning Protection:** The lightning protection system shall be installed and tested to ensure proper function. 

**NOTES:** 
- All work shall be performed in accordance with the project specifications and any applicable codes. 
- Submittals shall be provided as required by the project specifications. 
- Work shall be performed in a manner that minimizes disruption to the site and surrounding areas.
PARTIAL ROOF PLAN - AREAS D, E, & F

1. PROVIDE THREE COURSE BRICK REMOVAL / REPLACEMENT WITH NEW THRU-WALL FLASHING AND COUNTER FLASHING AS PER DETAIL.
2. PROVIDE ELASTOMERIC COATING AS SPECIFIED AT CONCRETE RISE WALL ABOVE COUNTER FLASHING, (TYPICAL AT BOTH SIDES OF WALL) AND TOP OF CONCRETE PARAPET FOR FULL LENGTH OF WALL.
3. REMOVE AND REPLACE EXISTING ROOF HATCH WITH NEW ROOF HATCH, SAFETY RAILING, AND LADDER SAFETY POST AS SPECIFIED. PROVIDE MANUFACTURER’S WALK PAD AT ROOF HATCH ACCESS.
4. TEMPORARILY REPOSITION LIGHTNING PROTECTION SYSTEM TO ALLOW FOR INSTALLATION OF NEW WORK. LIGHTNING PROTECTION SYSTEM SHALL REMAIN OPERABLE THROUGHOUT PROJECT. CONTRACTOR SHALL EMPLOY AT NO ADDITIONAL COST TO THE OWNER A LICENSED LIGHTNING PROTECTION CONTRACTOR TO REINSTALL THE LIGHTNING PROTECTION SYSTEM TO INCLUDE REPAIRS TO DAMAGED OR DEFECTIVE COMPONENTS AND SHALL INCLUDE ANY CODE UPGRADES. LAYOUT OF LIGHTNING PROTECTION SYSTEM SHALL BE IN SUCH A MANNER SO AS NOT TO CAUSE DAMAGE TO THE NEW ROOFING SYSTEM, COPING CAP OR OTHER ASSOCIATED ROOF SYSTEM COMPONENTS. LIGHTNING PROTECTION CONTRACTOR SHALL PROVIDE ALL NECESSARY ENGINEERING, ENGINEER’S SEAL, AND CERTIFICATION OF NEWLY INSTALLED SYSTEM. SUBMITTAL DATA AND SHOP DRAWINGS SHALL BE REQUIRED FOR THIS SCOPE OF WORK.
5. THRU-WALL OVERFLOW SCUPPERS TO REMAIN IN CURRENT POSITION. MODIFY EXISTING SCUPPER OPENINGS TO ACCOMMODATE NEW INSULATION AND CRICKET THICKNESS. SCUPPER OPENINGS SHALL BE A MINIMUM 8" WIDE BY 6" TALL. REPAIR EXTERIOR WALL TO MATCH EXISTING BRICK VENEER.

NOTE: REFER TO R1.03 FOR SPECIFIC ROOF NOTES.
SURFACE MOUNTED COUNTERFLASHING

1. INSTALL M-1 SEALANT AND TOOL TO FACILITATE WATER RUN-OFF
2. EXPANDING SHANK FASTENERS (APPROX. 12" O.C., DEPENDING UPON WIND ZONE AND LOCAL CONDITIONS)
3. SHEET METAL COUNTERFLASHING
4. COMPRESSIBLE ELASTOMERIC TAPE TO SPAN IRREGULARITIES
5.養墙或屋顶水冲
6. BASE SHEET IF REQUIRED

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ARMKO INDUSTRIES, INC.
100%  CONSTRUCTION DOCUMENTS

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3/29/2021