

PROJECT MANUAL

FOR

HURRICANES SALLY AND ZETA PERMANENT STORM REPAIRS



Mobile Airport Authority

**1891 NINTH AVENUE
MOBILE, AL 36615**

NOVEMBER 18, 2020

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SECTION 00300 - BID FORM SUPPLEMENT

PROJECT IDENTIFICATION: "Hurricane Sally & Zeta Permanent Storm Repairs; 2090 "C" and "1865 6th Street"

BID TO: Mobile Airport Authority
1891 Ninth Ave.
Mobile, AL 36615
Attention: Russell Stallings, russell@mobairport.com

UNIT PRICING – Owner can add/delete quantities from the Contract as required.

- a. Include cost to replace 750 SF of damaged 5/8" (match existing) plywood decking with new CDX, per SF. **750 SF @ _____ per SF = \$ _____ Included in Base Bid**

- b. Include cost to replace 250 BF damaged vertical PT wood fascia, per BF
250 BF @ _____ per BF = \$ _____ Included in Base Bid

- c. Include raking 500 LF of existing sealant and installing new sealant, per LF.
500 LF @ _____ per LF = \$ _____ Included in Base Bid

SECTION 01360 - MANUFACTURER WARRANTY CERTIFICATION

Description: IBC/IRC and warranty compliance document from roof system manufacturer, to be completed for each roof section requiring warranty (required Submittal).

1. Roof Section: _____
2. Manufacturer: _____
3. Contractor: _____
4. Site Pressures (IBC 1504.1): Z1: _____ Z2: _____ Z3: _____
5. Edge Pressures (IBC 1504.1): Outward: _____ Upward: _____
6. Testing: Roof Assembly#: _____ Edge Metal Assembly #: _____
7. Definitions:
 - a. "Substrate": Any surface the new repair sheet membranes and fluid applied membranes will be applied to, including existing roof membranes, decks, sheet metal and masonry walls.
 - b. "Roof Restoration System": The complete roofing system including Fluid Applied Membranes, Sheet Membranes, Adhesives, Mastics, Fabrics, Primers, Sheet Metal Flashing, Metal Soffit Panels, Fasteners, and Insulations.
8. SUBSTRATE ATTACHMENT: We agree to review existing Substrates and provide Contractor with anchorage requirements for compliance with IBC/IRC, Specification and Warranty requirements.
9. SUBSTRATE FOR ROOF SYSTEM ATTACHMENT: We have reviewed existing Substrates and approve Contractor's preparation and attachment procedures for Roof System application to SUBSTRATE, for IBC/IRC, Specification and Warranty compliance.
10. ROOF SYSTEM DESIGN: We have provided the Contractor with Roof System DESIGN specific to project, for IBC/IRC, Specification and Warranty compliance.
11. WORKMANSHIP CERTIFICATION: We agree to coordinate with contractor to inspect jobsite weekly to ensure workmanship compliance with IBC/IRC, Specification and Warranty requirements, and to issue written notification of any non-compliance construction.

Sincerely,

Manufacturer Representative PRINT NAME

Date

Manufacturer Representative SIGNATURE

SECTION 06100 - ROUGH CARPENTRY

PART I - GENERAL

1.1 SCOPE OF WORK

- A. Provide the wood products necessary to complete the roofing work in accordance with the Project Manual

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General Supplementary Conditions and Division 1 Specification Sections apply to this section.
- B. Section 07552 "Modified Membrane Roofing"

1.3 REFERENCES

- A. ASTM D - 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials
- B. Lumber Standards: American Softwood Lumber Standard PS 20-70 by the U.S. Department of Commerce.
- C. Plywood Standards: U.S. product Standard PSI-74/ANSI A 199.1 or latest APA Performance Standards for American Plywood Association.
- D. ASTM E - 108 Test Methods for Fire Test of Roof Coverings
- E. ASCE -7 American Society of Civil Engineering, Minimum Design Loads for Buildings and Other Structures
- F. FM Factory Mutual
- G. NRCA National Roofing Contractors Association
- H. UL Underwriters Laboratories
- I. WH Warnock Hersey

1.4 SUBMITTALS

- A. Provide submittals for lumber or plywood materials upon request.

1.5 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Use experienced installers.
- B. Lumber Standards: Comply with American Softwood Lumber Standard PS 20-70 by the U.S. Department of Commerce.
- C. Plywood Standards: Comply with U.S. product Standard PSI-74/ANSI A 199.1 or latest APA Performance Standards for American Plywood Association.
- D. Factory Marking: Mark each piece of lumber or plywood to indicate type, grade, agency providing inspection service.
- E. Size and Shape: Dress lumber 4 sides (S4S) and work to shapes and patterns shown. Nominal sizes shown and specified refer to undressed lumber dimensions. Detailed dimensions show actual lumber size required.

1.6 DELIVERY STORAGE AND HANDLING

- A. Time delivery and installation of carpentry work to avoid delaying other trades whose work is dependent on or affected by the carpentry work. Keep materials dry during delivery and storage
- B. Store lumber and plywood in stacks with provisions for air circulation within stacks. Protect bottom of stacks against contact with damp or wet surfaces.
- C. Protect exposed materials against water and wind. Remove damaged or unsuitable material from the job site.

1.7 MANUFACTURER'S INSPECTIONS

- A. Follow provisions in other Sections.

1.8 PROJECT CONDITIONS

- A. Follow provisions in other Sections.

1.9 SEQUENCING AND SCHEDULING

- A. Follow provisions in other Sections.

1.10 WARRANTY

- A. Follow provisions in other Sections.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide nailers, wood blocking and plywood as necessary to complete roofing work as directed by governing codes, roof manufacturer, and plans and specifications.

2.2 DESCRIPTION

- A. Construction Lumber: ACQ Pressure Treated, Standard Grade Douglas Fir, Western Larch, Western Hemlock (WWPA or WCLB) or No. 2 dimension Southern Pine (SPIB).
 - 1. Lumber for metal edge shall be minimum one-and-one-half inch (1-1/2") total thickness by three-and-one-half inch (3-1/2") thickness.
- B. Exterior Type Plywood: APA Rated sheathing, EXT.
- C. Bucks, Nailers, Blocking, Etc.: Treated No. 2 common grade of any WWPA or WCLA species or No. 2 Southern Pine(SPIB).
- D. Anchorage and Fastenings: Proper type, size material and finish for each application.
- E. Quality: Sound, seasoned, well manufactured materials of longest practical lengths and sizes to minimize joints. Free from warp which cannot be easily corrected by anchoring and attachment. Discard material with defects which would impair quality of work.

2.3 NAILS AND FASTENERS

- A. Fasteners: Use fasteners as dictated by Factory Mutual Wind Uplift requirements of Data Loss Sheet 1-49, meeting ASCE 7.
- B. Fasteners for attachment into steel structure
 - 1. Type: Tek5 Hex-Head Screw.
- C. Fasteners for attachment of plywood to lumber.
 - 1. 8d, hot dip galvanized, ring shank nail.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify measurements and dimensions shown before proceeding with carpentry work.
- B. Examine supporting structure and conditions under which carpentry work is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Correlate location of nailers, blocking and similar supports for attached work.
- D. Scribe and cope as required for accurate fit of carpentry work to other work.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Provide nailers, blocking and sleepers where shown on the drawings and details, or required for attachment of other work. Coordinate with locations of other work involved; refer to shop specifications of such work.
- B. Attach to substrate securely as required to support applied loading. Countersink bolts and nuts flush with surfaces.
- C. Securely attach wood nailers to substrates in accordance with Factory Mutual Loss Prevention Data Sheet 1-49 and as required by ASCE 7.
- D. Provide washers under bolt heads and nuts in contact with wood.
- E. Do not wax or lubricate fasteners that depend on friction for holding power.
- F. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish material.
- G. Make tight connections between members. Install fasteners without splitting of wood; predrill as required. Do not drive threaded friction type fasteners; turn into place. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.

3.3 PERIMETER LUMBER AT METAL EDGE

- A. Perimeter metal edge flanges are to be attached directly to specified lumber, stacked atop each other to a total thickness as needed for flush transition from adjacent insulation boards.

3.4 EQUIPMENT CURBS

- A. All curbs are required to have a nailable wood surface, to provide positive attachment of the Membrane Flashing System.
- B. All curb-heights are to be raised with additional nailers as needed to provide an eight (8) inch membrane flashing height.

3.5 DECK ATTACHMENTS – TYPICAL FOR WOOD DECKS

- A. Install specified nails at 6” oc along each rafter bearing point.

3.6 DECK REPAIRS – TYPICAL FOR WOOD DECKS

- A. Remove damaged deck from rafter to rafter.
- B. Install new deck nailed at 6” oc into rafters.

END OF SECTION 06100

SECTION 07552 - MODIFIED BITUMEN MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes a new roofing system, and in part, the following
 1. Remove and legally dispose of existing roofing, off site; and include roof deck repairs.
 2. Provide two-ply modified bituminous membrane roofing, installed over insulation over asphalt base sheet mechanically fastened to deck.
 3. General - Granular Surfacing:
 - a. White granular surfaced cap sheet (top ply), with heat weld side laps and cold process end-laps.
 - b. Granular surfaced membrane flashings at all locations where exposed, with matching granules sprinkled into bitumen exposed at joints and any other locations.
 4. Temporary roof membrane, if required by project conditions.

1.3 DEFINITIONS:

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

1.4 PERFORMANCE REQUIREMENTS:

- A. General: Install a watertight, modified bituminous membrane roofing and base flashing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.
- B. FM Listing: Provide modified bituminous membrane, base flashings, and component materials that meet requirements of FM 4450 and FM 4470 as part of a roofing system and that are listed in FM's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM markings.
 1. Roofing system and warranty shall comply with the following: (Refer to Structural Drawings, General Notes, etc., for additional information and requirements regarding wind loads).
 - a. Fire/Windstorm Classification: IBC 2015 compliance
 - b. Hail Resistance Rating: SH.
- C. Contractor shall provide Manufacturer's Wind Testing showing *actual tested pressures* as being in compliance with ASCE 7-10. Extrapolation of pressures will not be accepted.
- D. All Perimeter Sheet Metal Details shall meet wind uplift requirements per ANSI-SPR ES-1.

1.5 SUBMITTALS:

- A. Product Data: For each type of roofing product specified or otherwise required by project conditions, including manufacturers' technical product information, installation instructions, and recommendations for each type of roofing product required. Include sample of required manufacturer's warranty.
- B. Shop Drawings: On manufacturer's title block, to include plans, sections, details, and attachments to other work, indicating at least the following:
1. Base flashings, cants, and membrane terminations.
 2. Rigid and tapered insulation and methods of attachment.
 3. Any crickets, saddles, and tapered edge strips, including slopes.
 4. Compliance with ANSI-SPRI ES-1 requirements.
- C. Samples for Verification upon request - of the Following Products:
1. 12-by-12-inch square of modified bituminous, granule-surfaced cap sheets, of color specified.
 2. 6 each of fasteners for base sheet and for insulation fasteners of each type, length, and finish.
 3. Rigid insulation and insulation accessories.
 4. 12-inch long sample of parapet coping assembly - continuous metal wall cap/clip and exposed coping.
 5. 12-inch long sample of each type of 2-piece metal wall counterflashing
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install specified roofing system and is eligible to receive the roofing manufacturer's warranty.
1. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with code and warranty requirements.
- E. Manufacturer Certificates: The roofing manufacturer shall be required to provide documentation certifying that the roof design provided complies with the performance requirements, for that particular system, as set forth in **IBC Chapter 15 in Section 1504**, and manufacturer's requirements; The documentation shall be attached to the roof warranty provided at the close out of the project.
1. Also attach to manufacturer's completed and executed roofing warranty.
- F. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Design Professionals and owners, and other information specified.
1. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.
 2. Indicate compliance of bulk roofing asphalt materials delivered to Project with requirements.
- G. Research/Evaluation Reports: Evidence of roofing system's compliance with building code in effect for Project from a model code organization acceptable to authorities having jurisdiction.
- H. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.

- I. Inspection Reports: Copy of roofing system manufacturer's inspection reports of roofing installation and completed roof installation, within 5 to 7 days of inspections.
- J. Manufacturer Roof Acceptance Letter at completion of project stating no conditions were observed during weekly site visits that would create conditions excluded from warranty coverage, other than those previously reported and corrected by Contractor.

1.6 WARRANTY AND GUARANTEE:

- A. Manufacturer's System, Labor and Materials, and Wind Warranty: Provide manufacturer's standard "No Dollar Limit" (NDL) Full Service Warranty Agreement, including wind-load rider, flashing endorsement, signed by an authorized representative of modified bitumen roofing system manufacturer, on form published with current product literature as of date of Contract Documents.
 - 1. Warranty shall cover, in part, leakage or failure caused by improper workmanship or materials, to include insulation, insulation adhesives, fasteners, membrane adhesives, field membranes, flashing membranes, and sheet metal work.
 - 2. Warranty Period: Manufacturer's standard 30-year "NDL" warranty.
 - 3. Warranty shall have no provision for 'blanket voiding', where it can be permanently voided for any listed reason. [Blanket voiding is different than coverage exclusions].
 - 4. Warranty shall not charge Owner for leak investigation or storm event inspection costs for any reason.
 - 5. Warranty shall not require a maintenance program as a condition of its warranty.
- B. The Guarantee and Warranty shall be in addition to and run concurrent with other warranties and guarantees made by the Contractor under the requirements of the Contract Documents, and shall not be construed to limit or otherwise deprive the Owner of any other rights the Owner may have for remedy.
- C. Standard manufacturer's roofing warranties and guarantees which contain language regarding the governing of the warranties and guarantees by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such warranties and guarantees.

1.7 QUALITY ASSURANCE:

- A. Installer Qualifications: Engage an experienced roofing installer to perform Work of this Section who has:
 - 1. Specialized in installing modified bituminous roofing applications for at least five (5) verifiable years in the name of the business contracting for the work;
 - 2. Who has completed at least ten (10) verifiable modified bituminous roofing applications within the past five (5) years of similar scope and complexity with a verifiable record of successful in-service performance of roofing systems and for any required warranty and guarantee service required; and
 - 3. Who is approved, authorized, and/or licensed by the roofing system manufacturer to install manufacturer's product; and who is eligible to receive the roofing manufacturer's warranty.
 - 4. Installer's Field Supervision: Require Installer to maintain a full-time supervisors/foremen who are on job site during times that roofing work is in progress and who are trained and have at least 10 verifiable years experience in installing modified bitumen roofing systems and flashing systems similar to type and scope required for this Project. Provide at least the following personnel:
 - a. General roofing Foreman/Superintendent/Supervisor.

- b. Sheet metal Foreman.
 5. Installer shall own and operate all sheet metal fabrication equipment on his/her premises; Subcontracting the work will not be acceptable.
 6. All workers shall be full-time employees of the Installer; Subcontracting the work will not be acceptable.
- B. **Manufacturer Qualifications:**
1. Roofing system manufacturer shall have a minimum of 10 years experience in manufacturing modified bitumen roofing products, be ISO certified, and must be the original material manufacturer of the modified bitumen roofing products specified for this project.
 2. Provide evidence that Manufacturer has a current Net Worth (assets minus liabilities) of at least 50 times the cost of the Project, for assurance against future Warranty obligations.
- C. **Manufacturer's Inspections:**
1. When the project is in progress, the Roofing System Manufacturer will provide the following:
 - a. Provide job site inspections three days per week.
 - b. Keep the Design Professional informed as to the progress and quality the work as observed.
 - c. Report to the Design Professional in writing, any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
 - d. Confirm, after completion of the project and based on manufacturer's observations and tests, that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.
- D. **Fire-Test-Response Characteristics:** Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.
- E. **Pre-Roofing Conference:** A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Design Professional and attended by representatives of the Owner, Building Commission Inspector, General Contractor, Roofing Contractor, Roof Deck Manufacturer (if applicable), and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting.
1. The pre-roofing conference is intended to clarify demolition (for renovation or re-roofing projects) and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the

work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

2. The following are to be accomplished during the conference:
 - a. Review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
 - b. Establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
 - c. Establish roofing schedule and work methods that will prevent roof damage.
 - d. Require that all roof penetrations and walls be in place prior to installing the roof.
 - e. Establish those areas on the job site that will be designated as work and storage areas for roofing operations.
 - f. Establish weather and working temperature conditions to which all parties must agree.
 - g. Establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.
3. The Design Professional shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Building Commission, and the Building Commission Inspector.

1.8 DELIVERY, STORAGE, AND HANDLING:

- A. Comply with manufacturer's current written instructions and recommendations.
- B. Store roofing system materials in a dry, well-ventilated, weathertight location to ensure no significant moisture pickup and maintain at a temperature exceeding roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.
 1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
 2. Refer to Division 1 Sections "Summary of Work" and "Special Conditions," for additional information and requirements.
- C. Do not leave insulation or unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F.
- D. Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- E. Protect roofing insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's current written instructions for handling, storing, and protecting during installation.
- F. Refer to Division 1 Sections "Summary of Work" and "Special Conditions" for additional information and requirements regarding stored materials.

1.9 PROJECT CONDITIONS:

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed according to manufacturers' written instructions and warranty requirements.
- B. Temporary Roofing: When adverse job conditions or weather conditions prevent permanent roofing and associated work from being installed according to requirements, and Contractor determines that roofing cannot be delayed because of need for job progress or protection of other work, install temporary roofing. Engage roofing installer to provide temporary roofing and to remove it, if necessary, prior to proceeding with permanent roofing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide one of the following pre-approved roofing systems.
 - 1. Garland, Ecology or Hyload, meeting the following.
 - a. Base and Cap Membranes consisting either of SBS or Elvaloy Modifiers.
 - b. Required Finish TENSILE STRENGTH (ASTM D-5147)
2 in/min. @ 73.4 ± 3.6 °F MD and XD 310 lbf/in.
 - c. Required Finish TEAR STRENGTH (ASTM D-5147)
2 in/min. @ 73.4 ± 3.6° F MD and XD 500 lbf/in.
 - d. Total Roof Membrane Mil Thickness, min.: 220 mils
 - e. SBS Membrane Low Temperature Flex: -30F
 - f. SRI Top Membrane, min. 90
- B. When a particular trade name or performance standard is specified it shall be indicative of a required standard of quality, the same as are technical specifications.
- C. Bidders proposing substitutions shall properly submit all required information under Division 1 Section "Special Conditions" and in this Section 07552, at least 10 days prior to bid date and be subsequently accepted by Design Professional in writing or addendum.
 - 1. Any item or materials submitted as an alternate to those specified must comply in all respects with the quality and performance, including in part, job site investigation, of the brand name specified.
 - 2. On site inspections by the manufacturer's representative at least 3 times per week and as otherwise indicated and written reports of each inspection, as indicated, will remain a project requirement of the successful roofing system supplier.
- D. Open Flames shall only be allowed onsite for preparation and maintenance uses and not for continuous roof application. If open flames are used for maintenance purposes, Contractor shall provide copy of insurance policy indicating coverage for torch operations, and shall provide a 2-hour fire watch after all open flame operations are completed, with dated logs.

2.2 AUXILIARY MEMBRANE MATERIALS:

- A. General: Furnish auxiliary materials recommended by roofing system manufacturer for intended use and compatible with SBS-modified bituminous roofing.
 - 1. Furnish liquid-type auxiliary materials that meet VOC limits of authorities having jurisdiction.
- B. Asphalt Primer: ASTM D 41.

- D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- E. Mastic Sealant: Polyisobutylene, plain or modified bituminous, nonhardening, nonmigrating, nonskinning, and nondrying.
- F. Roof Insulation
 - 1. Polyisocyanurate; ASTM C-1289, 20 psi.
 - a. R-25 insulation assembly, using LTTR values for polyisocyanurate; four-and-one-half inches (4-1/2") thickness.
 - b. Max Dimensions;
 - (1) Adhered; two-and-one-half inches (2-1/2") x 4'0" x 4'0".
 - (1) Mechanically fastened; four-and-one-half inches (4-1/2") x 4'0" x 8'0".
 - 2. Cover Board; gypsum board, one-half inch (1/2") "Securock" or equal.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470; Designed for screw fastening of the required insulation board to deck, and for fastening base sheets, base-ply felts, and base flashings and for backnailing modified bituminous membrane to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.
- H. Metal and Flexible Flashing: Refer to Section 07600 - "Flashing and Sheet Metal."
- I. Wood Nailer Strips: Furnish preservative pressure treated (P.T.) wood nailer strips complying with requirements of Section 06100 - "Rough Carpentry."
- J. Cants: Fire retardant cellulosic-fiber board, complying with ASTM C 208, Type 2; or asphalt-coated fire retardant Perlite, complying with ASTM C-728.
- K. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve.
 - 1. Color: White.
 - 2. Type: To match granules on new roofing system cap sheet.
- L. Glass-Fiber Fabric: asphalt coated fiberglass cloth; complying with ASTM D 1668, Type 1.
- M. Miscellaneous Accessories: Provide miscellaneous accessories recommended in writing by roofing system manufacturer for intended use.

2.3 BASE-SHEET MATERIALS:

- A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. Provide where asphalt base sheets are mechanically fastened to wood decks.
- B. Required Base Sheet: Manufacturer's standard asphalt base sheet with granular surface, as specified above under Product/Manufacturer.
 - 1. Performance Criteria: ASTM D4601, Type II, #75.
- C. Base Sheet Fasteners; steel integral 1.0" diameter cap-head nails minimum 1-1/4" length.

2.4 TEMPORARY ROOFING AND VAPOR RETARDERS (only if required by project conditions):

- A. Temporary Roofing Membrane and Vapor Retarder (only if required by project conditions):
One ply specified Base Sheet or as approved by Manufacturer.

PART 3 - EXECUTION

3.1 ANTICIPATED SEQUENCE OF OPERATIONS – GENERAL:

- A. Roofing Contractor and Manufacturer’s Representative shall review the following, and submit any alternatives to the Design Professional and Construction Manager for review.
 - 1. Remove existing roofing system and imbedded sheet metals, down to deck.
 - 2. Replace damaged wood as necessary.
 - 3. Install new loose-laid rosin and mechanically fastened asphalt base sheet.
 - 4. Install 2-ply Modified Bitumen roofing system, and complete all related work, as necessary to provide a water-tight and weather-tight roofing system with the required 30 year warranty. Heat-weld all laps using Leister hot-air welder or equivalent.

3.2 EXAMINATION:

- A. Examine substrates, areas, and conditions under which roofing will be applied, with Installer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are in place and set and braced and that any roof drains and/or other penetrations are properly clamped into position.
- C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thicknesses of insulation required plus minimum roofing flashing height required.

3.3 PREPARATION:

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer’s written instructions. Remove sharp projections.
- B. Protect adjacent finishes from bitumen spillage.

3.4 GENERAL INSTALLATION REQUIREMENTS:

- A. Install modified bituminous membrane roofing system and roofing system accessories, vents, flashings, counterflashings, caps, other system components, etc., according to roofing system manufacturer’s current written instructions and applicable recommendations of NRCA/ARMA’s “Quality Control Recommendations for Polymer Modified Bitumen Roofing.”
 - 1. Install roofing system according to applicable specification plates of NRCA’s “The NRCA Roofing and Waterproofing Manual.”
- B. Start installation of modified bituminous membrane roofing in presence of roofing system manufacturer’s technical personnel.
- C. Shingling Plies: Install modified bituminous membrane roofing system with ply sheets shingled uniformly to achieve required number of membrane plies throughout. Shingle in direction to shed water.
 - 1. Where roof slope exceeds 1/2 inch per 12 inches (1:24), run sheets of modified bituminous membrane roofing parallel with slope. Backnail top ends of sheets to nailer strips.

- D. Cant Strips: Install and secure preformed 45-degree cant strips at junctures of modified bituminous membrane roofing system with vertical surfaces or angle changes greater than 45 degrees.
- E. Cooperate with inspecting and testing agencies engaged or required to perform services for installing modified bituminous membrane roofing system.
- F. Coordinate installing roofing system components so insulation and roofing plies are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.
 - 1. Provide cutoffs at end of each day's work to cover exposed ply sheets and insulation with a course of coated felt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- G. Substrate-Joint Penetrations: Prevent roofing asphalts used for temporary watertightness from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.5 BASE SHEET AND TEMPORARY ROOFING

- A. Install one lapped course of base sheet according to roofing system manufacturer's current written instructions, terminating behind cants. Attach base sheet in accordance with and subject to approval by manufacturer of primary roofing system, and as follows:
 - 1. Wood and Nailable Decks: Nail to substrate using FM-Approved fastener meeting ASCE 7 requirements.
- B. Only if required by project conditions, install temporary roof/vapor retarder.
- C. Completely seal temporary roof/vapor retarder at terminations, obstructions, and penetrations.

3.6 ROOF INSULATION

- A. Install insulation meeting the dimensions and performance requirements in the tested assembly.
- B. Install base layer(s) of polyisocyanurate insulation mechanically fastened to deck per manufacturer's shop drawings.
- C. Install tapered polyisocyanurate insulation layers where shown on plans.
- D. Install gypsum cover board mechanically fastened to deck.
- E. Adhesives
 - 1. Install adhesives at the patterns specified in the tested assembly.
 - 2. Install primer where directed by manufacturer.

3.7 ROOF MEMBRANE INSTALLATION

- A. General: Install modified bituminous membrane roofing system over area to receive roofing, according to manufacturer's current written instructions. Extend modified bituminous membrane over and terminate beyond cant.

1. Unroll sheets and allow it to relax for the minimum time period required by manufacturer.
- B. Base Sheet, Modified Bituminous Membrane: Install minimum of one ply of smooth surfaced modified bituminous base sheet over completed insulations.
- C. Single Cap-Ply, Modified Bituminous Membrane: Install a single ply of granular surfaced modified bituminous membrane cap sheet over completed ply sheet(s) starting at low point of roofing system.
1. Application: Adhere to Base Sheet(s) per manufacturer recommendations.
- D. Laps: Accurately align sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
1. Repair tears and voids in laps and lapped seams not completely sealed.
 2. Apply granules, while asphalt is hot, to cover asphalt bead exuded at laps and any other locations where occurs, so that finished appearance is similar to the adjacent factory applied cap sheet granular surfacing.
- E. Install modified bituminous membranes with side laps shingled with slope of roof deck where possible.

3.8 FLASHING AND STRIPPING INSTALLATION:

- A. Install modified bituminous membrane base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 2. Backer Sheet Application: If backer sheet is required by manufacturer of primary roofing system, install base-sheet backer and adhere to substrate in a uniform mopping of hot roofing asphalt.
 3. Base Flashing Application: Adhere modified bituminous membrane base flashing to substrate using self-adhesive or cold process adhesives. Do not use torch operations for any reason in vicinity of perimeter flashings and where flammable substrates (wood products) exist.
- B. Extend base flashing up the wall a minimum of 8 inches above roof membrane and 4 inches onto field of roof membrane. Lap subsequent flashing layer and top/cap flashings uniformly, at least 3-inches beyond edge of flashings below.
- C. Mechanically fasten top of modified bituminous membrane base flashing securely at terminations and perimeter of roofing.
1. Seal top termination of base flashing.
- D. Install modified bituminous stripping where metal flanges and edgings are set on membrane roofing, according to roofing system manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL:

- A. If for some unforeseen reason (other than for roofer's convenience), the event cap sheet cannot be installed the same day as Base Sheet, Manufacturer must review and approve condition of Base Sheet and whether repairs or priming are necessary.

- B. Roof Inspections: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation at least 3 times per week, and as otherwise indicated in "Quality Assurance" article above, and submit reports of each inspection to Design Professional, with copy to the Contractor.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Design Professional.
 - 1. Notify Design Professional and Owner at least 48 hours in advance, of the date and time of inspection.

3.10 PROTECTING AND CLEANING:

- A. Protect modified bituminous membrane roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Design Professional and Owner.
- B. Correct deficiencies in or remove modified bituminous roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.
- C. Clean spillage, spatter, etc., from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF MODIFIED BITUMEN MEMBRANE ROOFING

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes the following, where indicated, and where required by project conditions, and which are not part of other Sections:
 - 1. Prefinished metal counter flashing and base flashing.
 - 2. Miscellaneous prefinished metal wall flashing, counterflashing, and reglets.
 - 3. Exposed prefinished metal trim/fascia units, column caps, and other items as indicated on the Drawings.
 - 4. Elastic flashing at top of all curbs, top course of double wythe walls, at perimeters of all exterior wall openings (i.e.: doors, windows, louvers, etc.), through-wall flashing, and elsewhere as indicated.
 - 5. Miscellaneous sheet metal accessories as indicated and as required by project conditions.
- B. Exposed metal flashing is intended to be factory formed, prefinished baked enamel, as specified, in manufacturer's standard non-metallic color(s) selected by Design Professional after bidding.

1.3 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for Flashing, Sheet Metal and Accessories: Manufacturer's current technical product data, installation instructions and general recommendations for each specified sheet material, fabricated product, coating system, and color selection data.
- C. Samples of the following flashing, sheet metal, and accessory items:
 - 1. 12-inch-long samples of factory-fabricated products exposed as finished work. Provide complete with specified factory finish.
 - 2. Physical samples for color selections, where color selection is required.
- D. Shop drawings showing layout, profiles, methods of joining, and anchorages details, including major counterflashings, trim/fascia units, expansion joint systems, and other fabricated work. Provide layouts at 1/4-inch scale and details at 3-inch scale.
- E. Provide written assurance that each sheet metal product to be incorporated into a Roofing warranty is approved by the roof system manufacturer, and also code compliant per ANSI-SPRI ES-1.

1.4 PROJECT CONDITIONS:

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 ROOFING SHEET METAL, TRIM UNITS, & FLASHING:

- A. Provide sheet metal flashing compliant with IBC 1504 and ANSI-SPRI ES-1, and in compliance with 01360 manufacturer warranty certifications.
- B. Fabricate of **minimum 24-gage** metal, with minimum 50,000 p.s.i. yield, with **2-coat** full strength (70-percent) Kynar 500 resin (20-year) finish. Provide one of the following base metals, to be the same base metal used for other sheet metal applications and systems:
 - 1. ASTM A 792 aluminum-zinc allow coated steel sheet (“Galvalume”), or
 - 2. ASTM A 653, G-90 (galvanized) zinc-coated steel sheet.
 - 3. Typical metal flashing, except where specifically indicated otherwise.
- C. Prefinished Metal Drip Edge: Brake-formed sheet metal with at least a 3-inch roof deck flange at shingles and at least 4-inch roof deck flange at any membrane roofs; 1-inch flange extension to support any shingle roofing and 1/2” raised edge at membrane roofing; with a 1-1/2-inch fascia flange with a 3/8-inch hemmed edge drip for shingles and 5/8” for membrane roofs. Furnish in lengths of at least 10 feet.
- D. Prefinished Metal Flashing and 2-Inch High Diverter Strips:
 - 1. Install diverter strips 1’-0” above low roof edge(s) of sloped roofs, at all locations over exterior doors, and over exterior mechanical units where roof edge gutters or parapet walls do not occur.
- E. Finishes:
 - 1. Finish for any exposed metal flashings, gutters, downspouts, coping systems, etc., shall be **2-coat** 70% resin “Kynar 500” coating (i.e.: primer and color coats); and note that the finish system may be a traditional liquid or powder coat, complying with AAMA 2605, with a total dry film thickness of not less than 1.6-mils, and manufacturer’s standard 20-year minimum finish warranty; Manufacturer’s standard primer or washcoat on back side, and inside gutters.
 - 2. Colors: As selected by Design Professional after Bid Date, from manufacturer’s standard non-metallic colors; Minimum 15 colors to select from, including color(s) to match similar metal panel applications on the existing or new buildings, or window framing.

2.2 LEAD FLASHING (AT PLUMBING VENT STACKS):

- A. 4-pound lead sheet, fabricated to extend 4 inches minimum onto roof and turn down 1 inch minimum down inside vent stacks.
 - 1. For metal roofing, provide counterflashing over vent stacks, curbs, and other penetrations’ flashings in same material and color as metal roofing.
 - 2. Note that flashing at metal roofing shall also be as recommended by metal roof panel manufacturer and shall fully comply with applicable warranties.

2.3 **MISCELLANEOUS MATERIALS AND ACCESSORIES:**

- A. Solder:
 - 1. For use with steel or copper: Provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.
 - 2. For use with stainless steel: Provide 60 - 40 tin/lead solder (ASTM B 32), with acid-chloride type flux, except use rosin flux over tinned surfaces.
- B. Fasteners: Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- C. Bituminous Coating: SSPC - Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
- D. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.
- E. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Section 07900 - "Joint Sealers."
- F. Paper Slip Sheet: 5-lb. rosin-sized building paper.
- G. Counterflashing and Reglets: Metal units of type and profile indicated, or if not indicated, as required for the intended use, compatible with flashing indicated, noncorrosive.
 - 1. At surface-mounted parapet and wall flashing conditions, equivalent to **2-piece** "Springlok" Flashing Systems, as manufactured by Fry Reglet; Norcross, Georgia; Phone: 1-770-441-2337, except where brake-formed metal is specifically indicated.
- H. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.
- I. Provide precast concrete splashblock sloped away from building, approximately 12-inches wide x 24-inches long x 2-inches thick x 3-inches high, with 3-raised edges and one "open" end turned toward building – at locations where downspouts would otherwise drain on grade.
 - 1. Provide 1-precast concrete splashblock at each downspout which drains onto grade or paving;
 - 2. Provide 1-preformed metal pan with corrugated bottom and properly hemmed edges (minimum 12" x 24") at each downspout which drains onto a roof below.

2.4 **FABRICATED UNITS:**

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of SMACNA "Design

Professional Sheet Metal Manual” and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

1. At metal roofing and horizontal or sloped metal flashings over 6-inches wide, provide custom configurations and continuous brake-metal roofing system, with continuous concealed clip anchors rated for I-90 uplift conditions, with 1-inch high standing seam Pittsburgh lock-seam joints - filled with sealant, double-folded, and corners turned down at 45-degrees.
 2. Provide matching materials and finish for fascia metal covering, flashing, counterflashing and trim.
- B. Seams: Fabricate nonmoving seams in sheet metal with standing seam at exposed tops and lapped side or edge seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer. Pop-rivet joints for additional strength where required and at vertical faces.
- C. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS:

- A. General: Except as otherwise indicated, comply with manufacturer’s current written installation instructions and recommendations, with SMACNA “Design Professional Sheet Metal Manual,” and reviewed submittals and shop drawings.
1. Install manufactured, bought-out items in accordance with manufacturer’s current written instructions and recommendations.
 2. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.
- C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- D. Install reglets to receive counterflashing in manner and by methods indicated, in a straight line and single elevation.
- E. Install counterflashing in reglets, by snap-in seal arrangement for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant

exposure, or if not indicated, as recommended by referenced standards, flashing and roofing manufacturers, and otherwise as required for the intended application.

- F. Nail or anchor flanges of expansion joint units to curb nailers, at maximum spacing of 6 inches o.c. Fabricate seams at joints between units with minimum 3-inch overlap, to form a continuous, waterproof system.
- G. Flashing:
 - 1. Comply with manufacturer's current written instructions and recommendations for installation of all systems components in all applications indicated on the Drawings, and as otherwise required by project conditions.
 - 2. At any parapet wall and roof curbs applications, extend flashing continuous, over top of wall or curb, and turn down one inch (1") minimum on exterior side of wall and mechanically anchor in place at side of top of wall, below and concealed by continuous metal clip anchor (acting as termination bar) and metal cap flashing or coping, and down over top edge of roofing flashing material at roof side.

3.2 CLEANING AND PROTECTION:

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
 - 1. After cleaning, repair and restore damaged metal and metal finishes with prefinished paint manufacturer's special air-drying touch-up paint, in manner such that touch-up is not apparent.
 - 2. Replace damaged flashing and sheet metal work which cannot be repaired and when finish repair and restoration is not acceptable to Design Professional.
- B. Protection: Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

3.3 COUNTERFLASHINGS

- A. Remove existing metal counterflashings for vertical membrane flashing and replace with new.
- B. Remove existing metal counterflashings for metal base flashing and replace with new.
- C. Fabricate per manufacturer's shop drawings and warranty requirements.

3.4 PLUMBING VENTS

- A. Remove existing plumbing vent flashing and install new prefabricated plumbing vent flashing per manufacturer's shop drawings and warranty requirements.

END OF FLASHING AND SHEET METAL

SECTION 07900 - JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. Work described in this section includes joint sealer systems.

1.3 SYSTEM PERFORMANCES

- A. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an Installer who has successfully completed within the last three years at least 3 joint sealer applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.
- B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.
- C. Refer to Division 1 Section “Special Conditions”, for additional information and minimum experience requirements.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer’s complete product specifications, handling/installation/curing instructions, color charts and performance tested data sheets for each product required.

1.6 DELIVER, STORAGE AND HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.
- C. Refer to Division 1 Sections “Summary of Work” and “Special Conditions” for additional information and requirements regarding stored materials.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40° F.
 - 2. When joint substrates are wet due to rain, frost, condensation or other causes.
- B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.
- C. Asbestos Prohibited: Refer to Section 01015 - “Special Conditions”.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- B. Colors: Provide color of exposed joint sealers indicated, or if not indicated, as selected by Design Professional from manufacturer’s standard colors.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer’s standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.
- B. Multi-Part Nonsag Urethane Sealant: Type M, Grade NS, Class 25, Uses NR, M, A and, as applicable to joint substrates indicated, O.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. “Tuff Stuff MS”; Garland Company.
 - b. “Dynatrol 11” Pecora Corp.
 - c. “Sonolastic NP-1”; Sonneborn; BASF Building Systems.
 - d. “ERS-303-U”; Ecology Roof Systems.
 - 2. Locations for Use: Exterior joints and penetrations in vertical surfaces of concrete, and between metal and concrete, mortar of stone; overhead or ceiling joints; perimeters of metal frames in exterior walls; vertical expansion and control joints in masonry and concrete; and at all miscellaneous locations requiring a joint sealant.
 - 3. Equivalent 1-part sealants will be acceptable for interior surfaces only, by one of the above named manufacturers.
 - 4. Where used in conjunction with stucco or EIFS, provide 1-part non-yellowing aliphatic polyurethane, equivalent to one of the following:
 - a. Pecora “Dynatrol I-XL Tru-White”
 - b. Sonneborn “Ultra”; Sonneborn; BASF Building Systems

- C. Two-Part Pourable Urethane Sealant: Type M, Grade P, Class 25; Uses T, M, A and, as applicable to joint substrates indicated, O.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Chem-Calk 550"; Bostik Construction Product Div.
 - b. "Perma-Joint Sealant"; Garland Company
 - c. "Pourthane"; W. R. Meadows, Inc.
 - e. "NR-200 Urexpan"; Pecora Corp.
 - f. "Sonolastic Paving Joint Sealant"; Sonneborn Div.; BASF Building Systems
 2. Locations for Use: Exterior and interior expansion, control and construction joints in horizontal surfaces; and joints subject to pedestrian and light vehicular traffic.
- D. One-Part Mildew-Resistant Silicone Sealant: Type S, Grade NS; Class 25, Uses NT, G, A and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Dow-Corning 786"; Dow Corning Corp.
 - b. "All-Sil"; Garland Company
 - c. "SCS 1702"; General Electric.
 - d. "863 #345 White"; Pecora Corp.
 2. Locations for Use: Interior joints in vertical surfaces and terminal edges of tile; and joints At damp areas, such as around sinks and plumbing fixtures and pipe penetrations; and exposed terminal edges of vinyl flooring, such as around door frames and terminations at concrete.

2.3 LATEX JOINT SEALERS

- A. Acrylic-Emulsion Sealant: Manufacturer's standard, one part nonsag, acrylic, mildew resistant, acrylic emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior and on protected exterior exposures involving joint movement of not more than $\pm 7.5\%$.
1. Products: Subject to compliance with requirements, provide with one of the following:
 - a. "Chem-Calk 600"; Bostik Construction Products Div.
 - b. "AC-20"; Pecora Corp.
 - c. "Sonolac"; Sonneborn Building Products Div; BASF Building Systems.
 2. Locations for Use: Interior joints in field-painted vertical and overhead surfaces at perimeter of metal door frames, gypsum drywall, plaster and concrete or concrete masonry; and all other interior locations not indicated otherwise.

2.4 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type which are non-staining; 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. Plastic Foam Joint-Fillers:
 - 1. Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 2. Backer Rod: Premium grade, closed cell polyethylene foam rod; Sealtight Backer Rod, as manufactured by W.R. Meadows, Inc., or approved equivalent.
 - 3. Joint Filler: "Ceramar" flexible foam expansion joint filler, as manufactured by W.R. Meadows, Inc., or approved equivalent.
- C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.
- B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
- C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surface adjacent to joints.
- D. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork in preformed strips.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Require Installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
 - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellents; water; surface dirt and frost.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 3. Remove latex and form release agents from concrete.
 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- B. **Joint Priming:** Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.
- C. **Masking Tape:** Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALERS

- A. **General:** Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. **Elastomeric Sealant Installation Standard:** Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. **Latex Sealant Installation Standard:** Comply with requirements of ASTM C 790 for use of latex sealants.
- D. **Installation of Sealant Backings:**
1. Install sealant backings to comply with the following requirements:
 2. Install joint-fillers of type indicated or recommended by sealant manufacturer to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint-fillers.
 - b. Do not stretch, twist, puncture or tear joint-fillers.
 - c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.
 3. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.
- E. **Installation of Sealants:** Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided

for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

- F. Tooling of Nonsag Sealants:
 - 1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 2. Concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 PROTECTION AND CLEANING

- A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.
- B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

END OF SECTION 07900 - JOINT SEALERS

SECTION 15400 - ROOF DRAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2 GENERAL

- A. Existing drains will be re-worked, re-flashed, and deteriorated components replaced.
- B. At start of each workday, drains within daily work area shall be plugged. Plugs to be removed at end of each workday or before arrival of inclement weather.
- C. All drains will require new flashing lead or copper.
- D. New drains to be installed as directed by building owner's representative.

PART 2 – PRODUCTS

2.1 DRAIN ASSEMBLY

- A. Provide new drain assembly including bowl, clamping ring and strainer by;
 - 1. Zurn, Erie, PA
 - 2. J.R. Smith, Montgomery, Alabama
 - 3. Josam, Michigan City, Indiana
- B. Combination drain-and-overflow-drain assemblies are *not* approved (they do not provide sufficient clearance for roof manufacturer drain flashing).

2.2 DRAIN ACCESSORIES

- A. Replacement parts should be from same manufacturer of original drain.
- B. Metal flashing
 - 1. PVB wire mesh reinforced membrane flashing.
 - 2. ASTM B29-79(1984), four lb. sheet lead.
 - 3. Soft copper drain flashing sheet, 20 oz.

PART 3 - EXECUTION

3.1 NEW DRAIN INSTALLATION

- A. Remove all existing drain assemblies and replace with new. The drain assembly includes deck clamp, bolts, drain bowls, clamping rings and strainers.
- B. Install new drains in existing locations and where shown on drawings.
- C. Seal/plug drain to prevent water entry until service connection is completed.

- D. Install drain assembly per manufacturer's recommendations.

3.2 NEW OVERFLOW DRAINS

- A. Install roof drain style overflow drains minimum forty eight inches (48") distance apart from the primary drain, to provide clearance for roof system manufacturer's drain flashing details.
- B. Install overflow scuppers at within a distance from the primary drain so as not to overload the structural deck in the event of clogged primary drain.

3.3 SERVICE CONNECTIONS

- A. Locate new piping to include as few bends as possible.
- B. Do not overload any existing pipe and drain, ensure balanced disposal of all rain water.
- C. Make adequate provisions for thermal movement of all piping. Location should not be adjacent to structural columns.
- D. Provide minimum 1/8":12 slope or as required by International Plumbing Code (IPC), for all horizontal piping.
- E. Provide cleanouts at elbows under each drain, and at tops and bottoms of each vertical run, at connection to storm sewer, as called for by Plumbing Code, and as required to make sure that drainage system can be cleaned anywhere, if needed.
 - 1. Provide and install access panels if required for service cleanouts.
- F. Where new work joins old, provide all necessary materials, repairs, changes, and associated work as needed for proper connections.
- G. Make all connections watertight.
- H. Remove seal/plug and install strainer.
- I. Use insulation on all pipes and fittings from drains to existing down- pipes. Ensure full continuity of insulation over pipes, fitting, and connections. Provide concealed saddles at all hangers.

3.4 EXISTING DRAIN REPAIRS

- A. Remove flashing collar. Clean. If broken, replace.
- B. Drill out and re-tap broken clamping ring bolts.
- C. Broken drain bowls or must be replaced with new assembly with strainer.
- D. Broken clamping rings must be replaced with new matching diameter.

3.5 DRAIN FLASHING

- A. Install roof drain flashing and membrane stripping per roof system manufacturer's approved details and shop drawings
- B. For Coal Tar Surfaced Roofs; install gravel stop at edge of sump, flanges primed, set in asphalt mastic or specified adhesive, and stripped with 2 plies of specified stripping plies.

END OF SECTION 15400 - ROOF DRAINS