

SECTION 07 51 13 - MODIFIED BITUMENOUS ROOFING

1. GENERAL

1. RELATED DOCUMENTS

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

2. DESCRIPTION OF WORK:

- A. Extent of built-up roofing (BUR) system is indicated on the drawings and by provisions of this section, and is defined to include roofing, cover board immediately under roofing, insulation immediately under cover board, vapor barrier/retarder, composition flashing and stripping, and roofing accessories integrally related to roof installation.
- B. Types of BUR required for project include:
 - 1. California Title 24 Cool Roof Rated SBS Modified Roof System with Cool Roof Coating.
 - 2. Roof Scuttle and Safety Railing System
- C. Related Sections:
 - 1. Section 06 10 53 – Miscellaneous Rough Carpentry
 - 2. Section 07 62 00 – Sheet Metal Flashing and Trim
 - 3. Section 07 92 00 – Joint Sealers
 - 4. Section 23 05 48 – Vibration and Seismic Controls for HVAC
 - 5. Section 23 74 00 – Rooftop Packaged Air-Conditioning Units

3. DEFINITIONS

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to built-up roofing.

4. PERFORMANCE REQUIREMENTS

- A. General Performance: Installed built-up roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Modified built-up roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by modified built-up roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide built-up roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.
 - 1. Corner Uplift Pressure: 36 pounds per square foot
 - 2. Perimeter Uplift Pressure: 36 pounds per square foot

3. Field-of-Roof Uplift Pressure: 30 pounds per square foot.
 4. Corner dimension: 10'-0" x 10'-0"
 5. Perimeter Dimension: 10'-0"
- D. FM Global Approvals Listing: Provide modified built-up roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a built-up roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.
1. Fire/Windstorm Classification: Class 1A-90.
 2. 2019 CBC: Class A
- E. California Title 24, Part 6 Cool Roof Requirements: a low-sloped cool roof must have a minimum aged solar reflectance of 0.63 and a minimum thermal emittance of 0.75 or a minimum aged solar reflectance index (SRI) of 75.

5. SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For modified built-up roofing. Include plans, elevations, sections, details, and attachments to other work.
1. Base flashings and built-up terminations.
 2. Tapered insulation, including slopes.
 3. Crickets, saddles, and tapered edge strips, including slopes.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system and that is eligible to receive manufacturer's warranty.
- D. Manufacturer Certificates: Signed by roofing manufacturer certifying that modified built-up roofing complies with requirements specified in "Performance Requirements" Article.
1. Submit evidence of compliance with performance requirements, including FM listing.
 2. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing base and ply sheets, membrane backer and flashing sheets, reinforcement fabric felts and mats, adhesives, mastics, coatings, and sealants.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.
- F. Research/Evaluation Reports: For components of built-up roofing, from the ICC-ES.
- G. Maintenance Data and Training Materials: For roofing system to include in maintenance manuals and Owner's training library.
- H. Warranties: Sample of special warranties.
- I. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

6. QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM approved for built-up roofing identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by built-up roofing manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- C. Source Limitations: Obtain components of modified built-up roofing system from roofing system manufacturer. Other components including roof insulation, fasteners, cover boards, and substrate boards must be approved for use by roofing system manufacturer.
- D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical modified built-up roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
 - 7. Review governing regulations and requirements for insurance and certificates if applicable.
 - 8. Review temporary protection requirements for roofing during and after installation.
 - 9. Review roof observation and repair procedures after roofing installation.
- G. 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 manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

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

H. Asbestos Free Materials: No asbestos containing materials shall be used for the roofing system.

7. DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

8. PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.
- B. Temporary Roofing: When adverse job conditions or weather conditions prevent permanent roofing and associated work from being installed in accordance with requirements, and it is determined by Contractor that roofing cannot be delayed because of need for job progress or protection of other work, proceed with installation of temporary roofing. Engage roofing installer to provide temporary roofing, and to remove it prior to proceeding with permanent work.
 1. Record by way of Change Order the Owner's agreement to proceed with temporary roofing, along with additional costs and other changes (if any) to Contract Documents.

9. WARRANTY

- A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period.

1. Special warranty includes modified built-up roofing membrane, base flashings, roof insulation, fasteners, cover boards, vapor retarders, roofing accessories, all sheet metal-related details, termination details, walkway products, and other components of built-up roofing for the following warranty period:
 2. Warranty Period: 30 years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including labor and all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, vapor retarders, roofing accessories, all sheet metal-related details, termination details, walkway products, and other components of built-up roofing for the following warranty period:
1. Warranty Period: 36 months from date of Substantial Completion.
- C. Warranty repairs shall be made in the presence of SUSD Roofers.

2. PRODUCTS

1. BUILT-UP ROOFING MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. The Garland Company, Incorporated
 2. Architect and District approved equal

2. TEMPORARY ROOFING

- A. Temporary Roofing Member: 2 plies perforated No. 15 asphalt-saturated organic felt complying with ASTM D 226, Type I, set in and glaze-coated with hot moppings of ASTM D 312, Type III asphalt.

3. BASE-SHEET MATERIALS

- A. Base Sheet: ASTM D 4601, Type II, asphalt-coated fiberglass base sheet dusted with fine mineral surfacing on both sides.
1. Basis of design product: Garland, HPR Premium Glasbase
 2. Thickness, minimum, ASTM D 146: 0.055 inch (1.4mm).

4. ROOFING MEMBRANE PLIES

- A. Base (Ply) Sheet:
1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirement according to ASTM D 5147
 2. Tensile Strength, ASTM D 5147
 - a. 2 in/min. at 0 +/- 3.6 deg. F MD 100lbf/in XD 100lbf/in
 3. Tear Strength, ASTM D 5147
 - a. 2 in/min. at 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf.
 4. Elongation at Maximum Tensile, ASTM D 5147

- a. 2 in/min. at 0 +/- 3.6 deg. F MD 4% XD 4%
5. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F.

5. CAP SHEET MATERIALS

A. Modified Cap (Ply) Sheet:

1. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III, Grade G.
2. Tensile Strength, ASTM D 5147
 - a. 2 in/min. @73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in.
3. Tear Strength, ASTM D 5147
 - a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
4. Elongation at Maximum Tensile, ASTM D 5147
 - a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
5. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F.
6. Granule Color: White.

6. BASE FLASHING SHEET MATERIALS

- A. Backer Sheet: StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
- B. Granule-Surfaced Flashing Sheet: StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III, Grade G.
 1. Granule Color: White
- C. Single Ply Flashing Sheet: ASTM D4434, KEE membrane sheet.
 1. Basis of design product: Garland/VPG Solar Bright 60 mil KEE Membrane.
 2. Thickness, minimum, ASTM D 751: 0.040 inch (1.0 mm).
 3. Color: White.
 4. To be used when the base flashings exceed 18 inches in height or where indicated on the drawings. 24-gauge clad metal surface mounted reglet shall be required to separate the system types.
- D. Lead Flashing: 4 lb. sheet of common desilverized pig lead for all roof drains, pipe penetrations, and as required to meet manufacturer's warranty requirements. All lead flashing is to be supplied and installed by the roofing contractor.
 1. Lead pipe flashings are to include a 4 lb. factory lead counter flashing cap. All penetrations which will not allow for the factory cap shall have a 4 lb. lead umbrella flashing flared out, banded and sealed with Tuff Stuff urethane sealant.

7. ASPHALT MATERIALS

A. Interply Adhesive:

1. Weatherking Plus WC: ASTM D 3019; rubberized, polymer modified cold process asphalt roofing bitumen, V.O.C. compliant.
2. Performance Requirements:
 - a. Non-Volatile Content: ASTM D 4479; 78%
 - b. Density: ASTM D 1475; 9.0 lbs./gal.
 - c. Viscosity Stormer: ASTM D 562; 900-1100 grams
 - d. Flash Point: ASTM D 93; 100 deg. F (min.)
 - e. Slope (Maximum): 1:12
 - f. V.O.C.: ASTM D 3960; less than 250 g/l.
- B. Roofing Asphalt: ASTM D 312, Type IV as recommended by built-up roofing manufacturer for application.
- C. Asphalt Primer: ASTM D41.
2. AUXILIARY BUILT-UP ROOFING MATERIALS
 - A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.
 - B. Single Ply Sheeting Adhesive: Roofing manufacturer's one-part elastomer specially formulated adhesive for use with single ply flashing material specified.
 - C. Cold-Applied Flashing Adhesive: Roofing manufacturer's standard asphalt based, one- or two-part asbestos free, cold applied adhesive specially formulated for compatibility and use with built-up and CSPE base flashings.
 - D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing manufacturer for application.
 - E. Mastic Sealant: Modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
 - F. Parapet Wall Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, 5/8 inch thick.
 1. Products: Subject to compliance with requirements, provide the following:
 - a. Georgia-Pacific Corporation; Dens Deck Prime.
 - G. Screws for Fastening Parapet Wall Cover Board to Cold-Formed Metal Framing: Steel drill screws, in length necessary to achieve penetration through metal stud flange of no fewer than 3 exposed threads or 3/8 inch (whichever is greater), with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
 1. For steel framing from 0.033 to 0.112-inch-thick, use screws that comply with ASTM C 954.
 - a. Size: #6-20 x 1 ¼ inch (minimum)
 - b. Head Type: #2 Phillips drive, bugle-head.

- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening built-up roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing manufacturer.
- I. Metal Flashing Sheet: Metal flashing sheet is specified in Section 07 62 00 – Flashing and Sheet Metal.
- J. Wood Members, Units: Comply with requirements of other sections of these specifications for nailers, walkway units and other wood members indicated as roofing system work. Provide redwood or wood pressure treated with water-borne preservatives for aboveground use (AWPB LP-2).
- K. Vapor Retarder (Required on all wood roof decks): Red Rosin Paper; Install layer of red rosin paper shingled uniformly to achieve one ply over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of the roof.
 - 1. Basis of design product: WR Meadows; Red Rosin Paper.
 - a. Weight: 12 lbs. per roll.
 - b. Size: 500 square feet per roll.
 - c. 36" wide by 167' long.
- L. Miscellaneous Accessories: Provide miscellaneous accessories recommended by built-up roofing manufacturer.

3. ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FMG Approvals-approved roof insulation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II felt or glass-fiber mat facer on both major surfaces.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated. The minimum thickness shall be 3".
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

4. INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with built-up roofing.
- B. Fasteners: #14 (1/4-inch dia. Nominal) Factory-coated steel screws with 3-inch diameter metal or plastic plates meeting corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to steel deck and acceptable to roofing manufacturer. The screws shall be at least 3/4 inch longer than the assembly being secured. Number and spacing shall be as called for in this specification section and as shown on the approved drawings.

- C. Hot Asphalt Insulation Adhesive: Roofing Asphalt, ASTM D 312, Type III as recommended by built-up roofing manufacturer for application.
- D. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- E. Wood Nailer Strips: Comply with requirements in Section 06 10 00 - Rough Carpentry.
- F. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- G. Cover Board: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board, 1/2 inch thick.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Blue Ridge Fiberboard; Stuctodeck HD with Primed Red Coating
- H. Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, 1/2 inch thick.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Georgia-Pacific Corporation; Dens Deck Prime.
- I. Cover Board: ASTM C 1278, fiber reinforced, moisture-resistant gypsum blend substrate, 1/2 inch thick.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. USG; Securock.
- J. Substrate Joint Tape: 6- or 8-inch wide, coated, glass fiber.

5. COATING MATERIALS

- A. Roof Coating: Acrylic elastomer emulsion coating, formulated for use on bituminous roof surfaces:
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. The Garland Company, Inc.; Pyramic
 - 2. Initial Percent Elongation (Break): Not less than 60 percent at 0 deg F and 200 percent at 73 deg F when tested according to ASTM D 2370.
 - 3. Initial Tensile Strength (Maximum Stress): Not less than 100 psi at 73 deg F and 200 psi at 0 deg F when tested according to ASTM D 2370.
 - 4. Final Percent Elongation (Break) after Accelerated Weathering 1000 hours: Not less than 40 percent at 0 def F and 100 percent at 73 def F when tested according to ASTM D 2370.
 - 5. Permeance: Not more than 50 perms when measured according to ASTM D 1653.
 - 6. Accelerated Weathering 1000 hours: No cracking or checking when tested according to ASTM D 4798.
 - 7. Color: White

6. WALKWAYS

- A. Walkway Pads: TrafGuard by Viking Products Group. Slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing manufacturer, 1/2 inch thick, minimum.
 - 1. Pad Size: 3' x 4' at all HVAC unit access panel service areas and at roof hatches and roof access ladder locations. 3' x 4' between HVAC units and roof hatches and roof access ladder locations.

3. EXECUTION

1. EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 31 00 – Metal Roof Decking.
 - 4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

2. PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3. PARAPET WALL COVER BOARD INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions as submitted to and approved by Architect.
 - 1. Fasten cover board to cold-formed metal framing with screws.
 - 2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install boards with a 1/4-inch gap where they abut materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of cover board, but do not cut into facing.
- C. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.

4. INSULATION INSTALLATION

- A. Comply with built-up roofing manufacturer's written instructions, as submitted and reviewed by Architect during the submittal process, for installing roof insulation.
- B. Install one lapped base sheet course and mechanically fasten to substrate according to built-up roofing manufacturer's written instructions and as called for in these specifications and on the drawings.
- C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.
- D. Install tapered insulation under area of roofing to conform to slopes indicated.
- E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- F. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- H. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 - a. Field: 16 screws per 4-foot by 8-foot panel (2 square feet per screw).
 - b. Perimeter: 24 screws per 4-foot by 8-foot panel (1.33 square feet per screw).
 - c. Corners: 32 screws per 4-foot by 8-foot panel (1 square foot per screw).
 2. Set each subsequent layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.
- I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing manufacturer.
 1. Apply hot roofing asphalt to underside and immediately bond cover board to substrate.

5. BUILT-UP ROOFING INSTALLATION, GENERAL

- A. Install roofing membrane according to roofing manufacturer's written instructions as reviewed by Architect during the submittal process and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing" and as follows:
1. Deck Type: I (insulated).
 2. Base Sheet: 1.
 3. Number of Ply Sheets: 1.
 4. Cap Sheet: 1.
 5. Surfacing Type: S (coating). Coating shall comply with requirements of California Title 24, Part 6 for Cool Roof Application.
- B. Start installation of built-up roofing in presence of manufacturer's technical personnel.
- C. Cooperate with testing agencies engaged or required to perform services for installing roofing.
- D. Coordinate installation of roofing so insulation and other components of built-up roofing not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
1. Provide tie-offs at end of each day's work to cover exposed built-up roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- E. Asphalt Heating: Do not raise roofing asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Do not heat roofing asphalt within 25 deg F of flash point. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.
- F. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.

6. ROOFING MEMBRANE INSTALLATION

- A. Install lapped base sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:
1. Adhere to substrate in a solid mopping of hot roofing asphalt as directed by roofing manufacturer's written instructions as submitted to and reviewed by Architect.
- B. Install one ply sheet starting at low point of roofing. Align ply sheet without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.

1. Embed each ply sheet in a solid application of cold applied interplay adhesive applied at rate required by roofing manufacturer, to form a uniform membrane without ply sheets touching.
- C. Cap Sheet: Install lapped granulated cap sheet starting at low point of roofing system. Offset laps from laps of preceding ply sheets and align cap sheet without stretching. Lap in direction to shed water. Extend cap sheet over and terminate beyond cants.
 1. Embed cap sheet in a solid application of cold applied interplay adhesive applied at rate required by roofing manufacturer.

7. FLASHING AND STRIPPING INSTALLATION

- A. Install 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 built-up roofing manufacturer's written instructions and as follows:
 1. Backer Sheet Application: Adhere backer sheet to substrate in cold-applied adhesive.
 2. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive or sheet adhesive at rate required by roofing manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches above built-up roofing and 6 inches onto field of built-up roofing unless otherwise noted or shown in the details on the approved drawings. In most cases flashing shall extend up and over the top of the parapet wall under the parapet cap flashing and shall tie into the air barrier system specified in Section 07 27 26 "Fluid Applied Membrane Air-Barriers.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 1. Seal top termination of base flashing and all base flashing laps with a strip of glass-fiber fabric set in asphalt roofing cement.
- D. Roof Drains: Set 36-by-30-inch 4 lb. lead flashing (at each drain) in bed of asphalt roofing cement on completed built-up roofing. Clean lead flashing before priming. Prime lead flashing on both sides with asphalt primer by roll or brush application (spray application not allowed). Cover lead flashing with ply sheet and cap-sheet stripping and extend a minimum of 6 inches beyond edge of lead flashing onto field of built-up roofing. Clamp built-up roofing, metal flashing, and stripping into roof-drain clamping ring.
 1. Install stripping according to roofing manufacturer's written instructions.

8. COATING INSTALLATION

- A. Apply coating to roofing membrane and base flashings according to manufacturer's written instruction, by spray, roller, or other suitable application method.
 1. Prior to application of cool roof coating, contractor shall inspect roof with manufacturer's technical representative, the owner's roofing department, the architect, and the inspector of record and shall repair any deficiencies.
 2. Roofing manufacturer's acrylic coating primer shall be applied to all prepared surfaces to be coated at a rate of 1 gallon per 200-250 square feet.
 3. Apply coating in 2 layers at a rate of 1.5 gallons per 100 square feet for each layer. (3 gallons/SQ total.)

4. Back rolling the application of the two coats is required.

9. WALKWAY INSTALLATION

- A. Install walkway pads according to roof plan. Spot adhere to completed roofing membrane (after coating installation) with adhesive as approved by roofing manufacturer as reviewed and approved by Architect during the submittal process.

10. FIELD QUALITY CONTROL

- A. Manufacturer's Technical Representative: Contractor will engage a qualified manufacturer's technical representative acceptable to Owner for a minimum of 3 days on site to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection; Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
 1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- C. 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 compliance of replaced or additional work with specified requirements.

11. PROTECTING AND CLEANING

- A. Protect modified built-up 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 Architect and Owner.
- B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, and repair or reinstall roofing to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

12. ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 1. Owner: Stockton Unified School District.
 2. Address: 701 N. Madison Street, Stockton, CA 95212
 3. Building Name/Type: <Insert Building Name and School Name>
 4. Address: <Insert School Address>
 5. Area of Work: <Insert information>.
 6. Acceptance Date: <Insert date>.
 7. Warranty Period: <Insert time>.
 8. Expiration Date: <Insert date>.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding 75 mph;
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty and may be held liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

7. General Contractor or roofing installer shall contact and meet with SUSD roofers on site. Repairs shall be made in the presence of the SUSD Roofers.
 8. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this **<Insert day>** day of **<Insert month>**, **<Insert year>**.
1. Authorized Signature: **<Insert signature>**.
 2. Name: **<Insert name>**.
 3. Title: **<Insert title>**.

END OF SECTION 07 51 13

SECTION 07 62 01

ROOFING RELATED COPING, SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this section.

2. SUMMARY

- A. Provide all labor, equipment, and materials to fabricate and install the following.
 - 1. Drip Edge, Gravel Stop, and Flashing
 - 2. Fascia, Scuppers, and Trim
 - 3. Coping Cap at Parapets Pre Manufactured Systems
 - 4. Expansion Joint and Area Divider Covers
 - 5. Fascia and Edge Pre Manufactured Systems
 - 6. Gutters, Scuppers and Down Spouts
- B. Related Sections:
 - 1. Division 07 Section Common Work Results for Thermal and Moisture Protection
- C. Related Work Specified Elsewhere:
 - 1. Division 06 Section - Rough Carpentry
 - 2. Division 07 Section - Modified Bituminous Membrane Roofing
 - 3. Division 07 Section - Metal Roofing
 - 4. Division 07 Section - Metal Wall / Soffit Panels
 - 5. Division 07 Section - Joint Sealants
 - 6. Division 07 Section - Manufactured Metal Roof Panels
 - 7. Division 07 Section - Manufactured Metal Wall Panels

1.1. REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.
 - 2. ASTM A792 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
 - 3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 4. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 5. ASTM D692 Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
- B. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI)
 - 1. ANSI/SPRI ES-1 Testing and Certification Listing of Shop Fabricated Edge Metal
- C. Warnock Hersey International, Inc., Middleton, WI (WH)

- D. Factory Mutual Research Corporation (FMRC)
 - 1. FM 1-49 Loss Prevention Data Sheet
- E. Underwriters Laboratories (UL)
- F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 - 1. 1993 Edition Architectural Sheet Metal Manual
- G. National Roofing Contractors Association (NRCA)
 - 1. Roofing and Waterproofing Manual
- H. American Society of Civil Engineers (ASCE)
 - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures

1.1. SUBMITTALS FOR REVIEW

- A. Product Data:
 - 1. Provide manufacturer's specification data sheets for each product.
 - 2. Metal material characteristics and installation recommendations.
 - 3. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.
- B. Samples: Submit two (2) samples, illustrating typical metal edge, coping, gutters, fascia extenders for material and finish.
- C. Shop Drawings
 - 1. For manufactured and ANSI/SPRI ES-1 compliant shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
 - 2. Indicate material profile, jointing details, fastening methods, flashing, terminations, and installation details.
 - 3. Indicate type, gauge and finish of metal
- D. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

1.2. SUBMITTALS FOR INFORMATION

- A. Design Loads: Any material submitted as equal to the specified material must be accompanied by a report signed and sealed by a professional engineer licensed in the state in which the installation is to take place. This report shall show that the submitted equal meets the wind uplift and perimeter attachment requirements according to ASCE 7 and that the submitted equal edge metal system is compliant with the ANSI/SPRI ES-1 standard. Substitution requests submitted without licensed engineer approval will be rejected for non-conformance.
- B. Factory Mutual Research Corporation's (FMRC) wind uplift resistance classification: The roof perimeter flashing shall conform to the requirements as defined by the FMRC Loss Prevention Data Sheet 1-49.
- C. A letter from the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.
- D. Mill production reports certifying that the steel thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.
- E. Certification of work progress inspection. Refer to Quality Assurance Article below.

- F. Certifications.
 - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
 - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.3. CONTRACT CLOSEOUT SUBMITTALS

- A. General: Comply with Requirements of Section 01 78 00 – Closeout Submittals
- B. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.
- C. Roofing Maintenance Instructions. Provide a manual of manufacturer's recommendations for maintenance of installed roofing systems.
- D. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.4. QUALITY ASSURANCE

- A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years experience.
- B. Maintain a full-time supervisor/foreman who is on the job-site at all times during installation. Foreman must have a minimum of five (5) years experience with the installation of similar system to that specified.
- C. Source Limitation: Obtain components from a single manufacturer. Secondary products which cannot be supplied by the specified manufacturer shall be approved in writing by the primary manufacturer prior to bidding.
- D. Upon request fabricator/installer shall submit work experience and evidence of financial responsibility. The Owner's representative reserves the right to inspect fabrication facilities in determining qualifications.

1.5. DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.6. PROJECT CONDITIONS

- A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.

1.7. DESIGN AND PERFORMANCE CRITERIA

- A. Thermal expansion and contraction:
 - 1. Completed metal edge flashing system, shall be capable of withstanding expansion and contraction of components caused by changes in temperature

without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.1. WARRANTIES

- A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.
 - 1. Pre-finished metal material shall require a written thirty (30)- year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D2244 or chalking excess of 8 units per ASTM D659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
 - 2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for a warranty.
 - 3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.
 - 4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.
 - 5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer's recommendations.
 - 6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer's printed details and specifications.
 - 7. One manufacturer shall provide a single warranty for all accessory metal for flashings, metal edges and copings, along with the warranty for metal roof areas, membrane roof areas, and any transitions between two different material types.

PART 2 – PRODUCTS

1. PRODUCTS, GENERAL

- A. Refer to Division 01 Section "Common Product Requirements."
- B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.
- C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
 - 1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section.
 - 2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the

- three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
 4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2. ACCEPTABLE MANUFACTURERS

- A. The design is based upon roofing systems engineered and manufactured by

The Garland Company
 3800 East 91st Street
 Cleveland, Ohio 44105
 Representative: Rich Jones
 Telephone: (559) 647-1196
 Website: www.garlandco.com

3. MATERIALS

- A. General: Product designations for the materials used in this section shall be based on performance characteristics of the R-Mer Coping metal edge system manufactured by The Garland Company, Cleveland, OH, and shall form the basis of the contract documents.
- B. Materials: Minimum gauge of steel or thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor's National Association, Inc. recommendations.
- C. R-Mer Edge Coping Cap Cover and Splice Plate
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 22 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
 2. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .040" nom. or .050" nom. Will be based on the total wall width to meet ANSI SPRI ES1 Testing.
 3. R-Mer Edge Coping Chairs
 4. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
 5. Finishes
 6. Exposed surfaces for coated panels:
 - a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA).

PROPERTY	TEST METHOD	FLUOROCARBON*
Pencil Hardness	ASTM D3363 NCCA II-2	HB-H

Bend	ASTM D-4145 NCCA II-19	O-T
Cross-Hatch Adhesion	ASTM D3359	no loss of adhesion
Gloss (60° angle)	ASTM D523	25+/-5%
Reverse Impact	ASTM D2794	no cracking or loss of adhesion
Nominal Thickness	ASTM D1005	
Primer		0.2 mils
Topcoat		0.7 mils min
Clear Coat (optional, only to be used with 22 gauge steel)		0.3 mils

*Subject to minimum quantity requirements

b. Color shall be GARLAND Heritage Red

1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, shall be as shipped from the mil

4. RELATED MATERIALS AND ACCESSORIES

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: Specified in Section 07900 or on drawings.
- D. Self-Adhering Underlayment:
 1. 45 mil high temperature underlayment with cross laminated polymer surface. R-Mer Seal by The Garland Company
- E. Slip Sheet: Rosin sized building paper.
- F. Fasteners:
 1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
 2. Fastening shall conform to Factory Mutual requirements or as stated on section details, whichever is more stringent.
- H. Gutter and Downspout Anchorage Devices: Material as specified for system

PART 3 – EXECUTION

3. EXECUTION, GENERAL

- A. Refer to Division 07 Section Common Work Results for Thermal and Moisture Protection.

4. PROTECTION

- A. Isolate metal products from dissimilar metals, masonry or concrete with bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive reactions.

5. GENERAL

- A. Secure fascia to wood nailers at the bottom edge with a continuous cleat.
- B. Fastening of metal to walls and wood blocking shall comply with building code standards.
- C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.
- D. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using fasteners as required by the system. Exposed face fastening will be rejected.

6. INSPECTION

- A. Verify that curbs are solidly set and nailing strips located.
- B. Perform field measurements prior to fabrication.
- C. Coordinate work with work of other trades.
- D. Verify that substrate is dry, clean and free of foreign matter.
- E. Commencement of installation shall be considered acceptance of existing conditions.

7. MANUFACTURED SHEET METAL SYSTEMS

- A. Furnish and install manufactured fascia and coping cap systems in strict accordance with manufacturer's printed instructions.
- B. Provide factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc. refer to Source limitation provision in Part 1.

8. SHOP-FABRICATED SHEET METAL

- A. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
- B. Hem exposed edges.
- C. Angle bottom edges of exposed vertical surfaces to form drip.
- D. Lap corners with adjoining pieces fastened and set in sealant.
- E. Form joints for gravel stop fascia system, coping cap with a 3/8" opening between sections. Back the opening with an internal drainage plate formed to the profile of fascia piece.

- F. Install sheet metal to comply with referenced ANSI/SPRI, SMACNA and NRCA standards.

9. FLASHING MEMBRANE INSTALLATION

- A. Scupper Through Roof Edge
 - 1. Install scupper box in a one fourth (1/4) inch bed of mastic. Assure all box seams are soldered and have minimum four (4) inch flange. Make sure all corners are closed and soldered.
 - 2. Prime metal edge at a rate of one hundred (100) square feet per gallon and allow to dry.

- B. Drip Edge Detail
 - 1. Position base plies of the Built-Up and/or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 - 2. Install continuous cleat on face of nailer and fasten six (6) inches on center.
 - 3. Install new Drip Edge hooked to continuous cleat. Set metal flange into roofing cement, nail every three (3) inches on center, and prime at a rate of one hundred (100) square feet per gallon.
 - 4. Drip Edge flange with base flashing membrane extending six (6) inches into roof field, followed with a cap sheet extending nine (9) inches onto roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

- F. Gravel Stop Detail
 - 1. Position base plies of the Built-Up and/or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 - 2. Install continuous cleat on face of nailer and fasten six (6) inches on center.
 - 3. Install new Gravel Stop hooked to continuous cleat. Set metal flange into roofing cement, nail every three (3) inches on center, and prime at a rate of one hundred (100) square feet per gallon.
 - 4. Strip in Gravel Stop flange with base flashing membrane extending six (6) inches into roof field, followed with a cap sheet extending nine (9) inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

- G. Edge Metal With Gutter
 - 1. Positions base plies of the Built-Up and/or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install manufacturer's membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 - 2. Install gutter and strapping fastening six (6) inches on center.
 - 3. Install continuous cleat on face of nailer and fasten six (6) inches on center.
 - 4. Install new edge metal hooked to continuous cleat. Set metal flange into roofing cement, nail every three (3) inches on center, and prime at a rate of one hundred (100) square feet per gallon.
 - 5. Strip in edge metal with base flashing membrane extending six (6) inches into roof field, followed with a cap sheet extending nine (9) inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

- H. Snap-On Coping Cap Detail
 - 1. Install Miters first.

2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the wall edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
3. Install minimum sixteen (16) gauge, sixteen (16) inch long by specified width anchor chair at [Contact Garland Representative] feet on center.
4. Install six (6) inch wide splice plate by centering over sixteen (16) inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately two (2) inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

10. CLEANING

- A. Clean installed work in accordance with the manufacturer's instructions.
- B. Replace damaged work than cannot be restored by normal cleaning methods.

11. CONSTRUCTION WASTE MANAGEMENT

- A. Remove and properly dispose of waste products generated. Comply with requirements of authorities having jurisdiction.

12. FINAL INSPECTION

- A. At completion of installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.
- B. Inspect work and flashing of roof penetrations, walls, curbs, and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- D. Notify the [Contractor] [Architect] [Owner] upon completion of corrections.
- E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.
- F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

13. DEMONSTRATION AND TRAINING

- A. At a time and date agreed to by the Owner, instruct the Owner's facility manager, or other representative designated by the Owner, on the following procedures:
 1. Troubleshooting procedures
 2. Notification procedures for reporting leaks or other apparent roofing problems
 3. Maintenance
 4. The Owner's obligations for maintaining the warranty in effect and force
 5. The Manufacturer's obligations for maintaining the warranty in effect and force.

END OF SECTION 07 62 00