

**LONG BEACH CITY COLLEGE DISTRICT
CONTRACTS MANAGEMENT DEPARTMENT**

**4901 EAST CARSON STREET
LONG BEACH, CA 90808
Ph. (562) 938-4843**

**BID C2194 BUILDING MM CONSTRUCTION TRADES 1
MODERNIZATION PROJECT
AT THE
PACIFIC COAST CAMPUS**

ADDENDUM NO. 3

JULY 30, 2020

This Addendum forms a part of the Contract Documents and modifies the original Contract Documents. Acknowledge receipt of the Addendum on Section 1.2 of the Bid Proposal. Failure to do so may result in the bid being deemed non-responsive.

Note: It is the responsibility of all bidders to notify all subcontractors from whom they request bids and from whom they accept bids of all changes contained in this addendum.

ADDENDUM NO. 3 CONTENTS

- I. SPECIFICATION REVISIONS**
- II. ATTACHMENTS**

I. SPECIFICATION REVISIONS:

1. Revise the Specification Section 07 5520 Modified Bituminous Membrane Roofing with attached updated Section 07 5520.

II. ATTACHMENTS:

1. Updated Section 07 5520 Modified Bituminous Membrane Roofing.

*****END OF ADDENDUM NO. 3*****

LONG BEACH CITY COLLEGE DISTRICT

Alan Moloney

**Alan Moloney
Deputy Director Purchasing & Contracts**

Bid C2194 Building MM Construction Trades
One Modernization project

Addendum No. 3

Attachment 1 - Revised Specifications

SECTION 075520 SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.01 SUMMARY – SYSTEM DESCRIPTIONS for STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

A. Steel Decking:

1. The new roof system shall consist of a modified bitumen cap sheet, torch applied over a modified bitumen base membrane, torch applied over a new ½ inch thick underlayment board. The underlayment board shall be mechanically fastened using Factory Mutual approved insulation plates and fasteners over min R-value of 30 layer of polyisocyanurate roof insulation. The polyisocyanurate roof insulation shall be mechanically fastened using Factory Mutual approved insulation plates and fasteners over the metal roof deck. The entire installed system, including base flashings and wall coverings shall be covered with a minimum 32 dry mils of a Title 24, Energy Star rated coating material.

B. Section Includes:

2. Providing labor, equipment, and miscellaneous materials to install Owner purchased and furnished roofing materials over properly prepared substrate.

C. Related Sections:

1. Section 01 3300: Submittal Procedures; general LEED submittal requirements.
2. Section 01 3329: Sustainable Design Reporting/LEED Requirements; specific LEED submittal requirements.
3. Section 06 1053: Miscellaneous Carpentry
4. Section 07 2100: Building Insulation
5. Section 07 6200: Sheet Metal Flashing and Trim
6. Section 07 7233: Roof Hatches

D. Related Requirements:

1. Project is under CMAS schedule (Contract No. 4-01-56-0006A), where some products and materials will be furnished by Owner for installation by roofing installer (OFCI), and other products will be furnished and installed by roofing installer.
 - a. Products listed in Article 2.03 are to be supplied by Owner.
 - b. Other products to be provided by roofing installer.
2. Refer to District's Division 00 Documents, including General Conditions, and other Division 01 Sections, for additional requirements.

E. Performance Requirements:

1. Roofing System Design: Uplift pressures calculated according to ASCE/SEI7.
2. FM Approvals Listing: Class 1A-90.
3. Underwriters Laboratories, Inc. – Northbrook, IL: Class A assembly.
4. Cool Roof Performance: ENERGY STAR – “Low Slope”.

1.02 REFERENCES

A. American Society of Civil Engineers (ASCE):

1. ASCE 7-10: Minimum Design Loads for Buildings and Other Structures.

- B. ASTM International (ASTM):
 - 1. ASTM A 653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. ASTM C 1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - 3. ASTM D 451 – Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
 - 4. ASTM D 1079 – Standard Terminology Relating, to Roofing, Waterproofing and Bituminous Materials.
 - 5. ASTM D 1227 – Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
 - 6. ASTM D 1863 – Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
 - 7. ASTM D 4S86 – Standard Specification for Asphalt Roof Cement.
 - 8. ASTM D 2824 – Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.
 - 9. ASTM D 5147 – Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
 - 10. ASTM D 6162 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
 - 11. ASTM D 6163 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
 - 12. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings.

- C. Factory Mutual Global (FMG):
 - 1. FM Approval 4435 – Approval Standard for Edge Systems Used with Low Slope Roofing Systems.
 - 2. FM Approval 4470 – Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction.

- D. National Roofing Contractors Association (NRCA):
 - 1. NRCA Roofing Manual.

- E. UL, LLC (UL):
 - 1. UL 790 – Standard for Standard Test Methods for Fire Tests of Roof Coverings.

- F. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI):
 - 1. ANSI/SPRI ES-1 – Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
 - a. Testing and Certification Listing of Shop Fabricated Edge Metal and Coping.
 - b. Only required for fabricated item procedures.

- G. South Coast Air Quality Management District (SCAQMD):
 - 1. SCAQMD Rule 1168 – Adhesive and Sealant Applications

1.03 QUALITY ASSURANCE

- A. Exterior Fire-Test Exposure: Class A.

- B. In accordance with the requirements of the current California Building Code, the material manufacturer's published general installation requirements, and industry standards. Industry standards for roofing are to be established by the National Roofing Contractors Association's latest edition Manual, with standards for sheet metal components established by the latest manual from the Sheet Metal and Air Conditioning Contractors National Association. In the event of a conflict with these specifications and drawings with the above, the more stringent requirement shall prevail.
- C. Final Inspection
- D. Verification Inspection.
- E. Roofing Installer Qualifications: Roofing installer specializing in modified bituminous roof application with minimum 10 years experience.
 - 1. Provide proof of certification to install manufacturer's roofing system within past three years.
 - 2. Provide letter from manufacturer at time of award of Contract, stating roofing installer is certified installer in good standing and approved to install roofing system.
 - 3. Issuance Date of Letter: Maximum fifteen days prior to Project bid date.
 - 4. Provide letter to Owner prior to award of Contract.
- F. Roofing Installer's Field Supervision: Require roofing installer to maintain full-time Supervisor/Foreman on Project Site during installation of bituminous membrane roofing work.
 - 1. Maintain proper supervision of workmen while roofing work is in progress.
 - 2. Supervisor/Foremen shall be in possession of copy of roofing specification and be made available on roof.
- G. Contractor and roofing installer's responsibility to protect exposed buildings affected by roofing activities from possible weather damages, until completion of roofing work.
- H. Disqualification of Bidders: Bidder may be disqualified by Owner for one or more reasons as indicated in Division 00 General Conditions.
- I. Roofing Pre-installation Meeting:
 - 1. Before scheduled commencement of roof system installation and associated work, convene meeting at Project Site with installer of each component of associated Work:
 - a. Installer of deck or substrate construction to receive roofing work
 - b. Installer of rooftop units and other work where roofing must precede or follow roofing work, including mechanical work.
 - c. Owner and Architect.
 - d. Roofing system manufacturer's representative.
 - e. Other representatives directly concerned with performance of Work, including, where applicable, testing agencies and authorities having jurisdiction.
 - 2. Objectives to be reviewed include:
 - a. Requirements of CMAS schedule and coordination between Owner and roofing materials supplier as to products, materials, and quantities to be furnished by Owner and those to be furnished by roofing installer.
 - b. Foreseeable methods and procedures related to roofing work.
 - c. Tour representative areas of roofing substrates/decks.
 - 1) Inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by other trades.
 - d. Structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
 - e. Fire watch requirements of two hours at the end of each working day.

- f. Roofing system requirements as indicated in Drawings, Specifications, and other contract documents.
- g. Required submittals both completed and yet to be completed.
- h. Finalize construction schedule related to roofing work and verify availability of material.
 - 1) Ensure installer's personnel, equipment and facilities are sufficient to make progress and avoid delays.
- i. Required inspection, testing, certifying, and material usage accounting procedures.
- j. Weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
 - 1) Notification procedures for weather or non-working days.
- k. Record discussion of meeting including decisions and agreements or disagreements reached and furnish copy of record to each party attending.
 - 1) Should substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

1.04 SUBMITTALS

- A. Prepare and provide complete submittal package consisting of:
 - 1. Required documents such as, but not limited to installer's qualifications, Shop Drawings, and warranties.
 - a. Include submittals for Owner furnished materials.
 - b. Requests for substitutions are subject to review according to General Conditions.
 - c. Should substitution be approved, substitution material must conform to required Submittals.
- B. Product Data:
 - 1. Roofing system manufacturer's product data for products necessary for completion of roofing system and as specified including Owner Furnished Contractor Installed (OFCl) materials
 - a. Include roofing system manufacturer's technical product data, installation instructions, and recommendations for each type of roofing product required.
 - b. Include data substantiating that materials comply with minimum specified requirements.
- C. Test Data and Certifications:
 - 1. Independent test data that indicates cap sheet complies with Cool Roof Rating Council (CRRC) and Title 24 Energy Standards requirements.
 - 2. Manufacturer's Certificate: Certified copy of roofing system manufacturer's ISO 9001 compliance certificate.
- D. Installer Qualifications:
 - 1. Installer qualifications; refer to in "Quality Assurance" Article.
- E. Samples:
 - 1. Samples of non-OFCl materials necessary for completion of roofing system.
- F. Warranty:
 - 1. Unexecuted Manufacturer's Thirty Year High-Performance No Dollar Limit (NDL) warranty covering labor and materials, not pro-rated.
 - 2. Provide five years labor warranty to roofing system manufacturer and Owner.

- G. LEED Submittals:
1. Product Data for emittance, reflectance, and SRI values.
 - a. Documentation of compliance with requirements for reduction of heat island effect of specified materials
 - b. Product Certificates and Laboratory Test Reports.
 2. Recycled Content: Certify recycled content of specified roofing materials.
 - a. Indicate recycled content percent and whether pre-consumer or post-consumer.
 - b. Include statement indicating costs for each product having recycled content with manufacturer's receipts of proof of purchase.
 - c. Product Certificates and Laboratory Test Reports

1.05 SYSTEM DESCRIPTION

- A. Roof Deck:
1. Metal Deck:
 - a. Mechanically fasten/adhere specified R-Value of polyisocyanurate insulation to the structural deck.
 - b. Mechanically fasten/adhere ½" Densdeckprime insulation roof coverboard complying with FM 1-90 wind uplift fastening pattern.
- B. Roofing Membrane Installation:
1. Apply 110 mil – HPR Torchbase -- SBS-modified base sheet with torch application.
 2. Apply 195 mil – Stressply IV Mineral -- SBS-modified cap sheet with torch application.
 3. Apply HPR Torchbase SBS-modified flashing ply with torch application in flashing areas extending 6 inches onto roof field. Apply additional Stressply IV Mineral modified flashing cap sheet with torch application in flashing areas extending 9 inches onto roof field.
 4. Spray apply Title 24 Energy Standards compliant, White Star reflective white coating at 2 gallons/square.
 - a. Power wash roof surface prior to applying coating.
 - b. Ensure there is no moisture on roof surface prior to application of coating.
 - c. Embed 200 lbs per sq of Title 24 white gravel into the coating.
 5. Edge metal, coping cap, and counterflashing metal to be installed by roofing contractor with ANSI SPRI ES-1 compliant Rmer Flat Stock sheet metal.
 6. Place conduit on rubber blocks and walkway pads.
 7. Flash penetrations with umbrella storm cover.
 - a. Roofing contractor to supply and install lead flashings.
 8. Roofing installer is responsible for ponding water and to ensure positive drainage.
 9. Pitch pockets are not permitted.

1.06 PROJECT CONDITIONS

- A. Weather Condition Limitations: Do not apply roofing membrane during inclement weather or when 40 percent change of precipitation is expected.
- B. Do not apply roofing insulation or membrane to damp deck surface.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

- D. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- E. Slopes greater than 2: 12 require back-nailing to prevent slippage of ply sheets.
 - 1. Use ring or spiral-shank one inch cap nails, or screws and plates at rate of one fastener per ply, including membrane, at each insulation stop.
 - 2. When slope exceeds 2:12, install plies parallel to slope to facilitate back nailing.
 - 3. Install four additional fasteners at upper edge of membrane when strapping plies.
- F. Application Conditions:
 - 1. Take precautions when applying materials with spray equipment, to prevent over spray and solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property.
 - a. Exercise care to do following:
 - 1) Close air intakes into building.
 - b. Post and enforce "No Smoking" signs.
 - 2. Avoid inhaling spray mist.
 - a. Take precautions to ensure adequate ventilation.
 - 3. Protect completed roof sections from foot traffic for a period of at least 24 to 48 hours at 75 degrees F and 50 percent relative humidity, or until fully cured.
 - 4. Minimum temperature for application is 40 degrees F and rising.
- G. Maintain ABC-rated dry chemical fire extinguishers in locations per Cal/OSHA requirements
 - 1. Make workers aware of locations and how to properly operate extinguishers.
 - 2. 2 hr fire watch by the installer is required at the end of each day.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Roofing installer is responsible for coordinating OFCI material delivery by roofing materials supplier to Owner.
- B. Receive OFCI material at Project Site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
 - 1. Damaged material to be noted at delivery and reported immediately to Owner and roofing system manufacturer.
- C. Roofing installer is responsible for materials upon delivery.
 - 1. Lost or stolen material must be replaced by roofing installer.
 - 2. Owner is absolved of liability in regards to material delivery or material storage.
 - 3. Owner may elect to not store material on their property and have roofing installer store material at third party insured storage area in accordance with requirements of Division 00 General Conditions.
- D. Store materials at room temperature until immediately prior to application.
 - 1. Discontinue application when material cannot be stored at temperature, which permits even distribution during application
- E. Store and handle roofing sheets in dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure.
 - 1. Store rolls of felt and other sheet materials on pallets or other raised surface.

2. Stand roll materials on end.
 3. Cover roll goods with canvas tarpaulin or other breathable material
 - a. Do not use polyethylene.
- F. Do not leave unused materials on roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- G. Responsibility of roofing installer to secure material and equipment on Project Site.
1. Should material or equipment be stored on roof, roofing installer must make sure that integrity of roof deck is not compromised.
 2. Damage to roof deck caused by roofing installer will be sole responsibility of roofing installer and will be repaired or replaced at his expense.

1.08 INSPECTION AND COORDINATION

- A. Comply with roofing inspector's requirements as provided by roofing system manufacturer.
1. It is roofing installer's responsibility to keep roofing inspector, Project Inspector, Architect, and Owner informed regarding issues and concerns.

1.09 SEQUENCING AND SCHEDULING

- A. Roofing installer is responsible for coordinating material ordering and delivery with roofing system manufacturer and Owner (for OFCI materials) within Project Schedule.
- B. Sequence installation of modified bituminous sheet roofing with related units of work specified in other sections to ensure that roof assemblies, including roof accessories, flashing, trim, and joint sealants are protected against damage from effects of weather, corrosion and adjacent construction activity.
- C. Work must be fully completed on each day.
1. Phased construction is not acceptable.
 2. Phased construction is defined as cap sheet not being applied over installed base sheet within same 12 hour workday.

1.10 WARRANTY

- A. Upon completion of Project, provide following:
1. Minimum five year labor warranty to Owner and roofing system manufacturer at no charge.
 2. Executed roofing system manufacturer Thirty Year High-Performance No Dollar Limit (NDL) warranty covering labor and materials.
- B. Roofing installer to submit minimum five-year warranty to roofing system manufacturer with copy directly to Owner.

PART 2 PRODUCTS

2.01 GENERAL

- A. Basis-of-Design: Design of roofing system is based upon roofing systems engineered and manufactured by The Garland Company, Cleveland, OH.

- B. Roofing installer is responsible for manufacturer's materials in excess of Owner purchased and furnished amount.
 - 1. Owner to provide material quantities matching amounts listed in Article 2.03.
 - 2. Additional roofing system manufacturer's material required to complete Project is responsibility of roofing installer.
 - 3. Roofing contractor responsible for purchasing additional materials required, including freight and tax charges.

- C. Roofing installer to be present at delivery of Owner purchased roof materials.
 - 1. Owner has no responsibility to provide equipment for handling or loading materials to roofing installer's trucks.
 - 2. Upon signature of delivery, roofing installer assumes full responsibility for Owner purchased roof materials.
 - 3. Replacement of materials lost or stolen are responsibility of roofing installer.
 - a. Roofing installer is responsible for freight and tax on replaced materials.

2.02 MEMBRANE MATERIALS

- A. Modified Base Sheet:
 - 1. HPR Torchbase, complying with ASTM D 6163 Type III Grade G
 - 2. Performance Characteristics:

Tensile Strength (ASTM D 5147) 2 in/min. at 73.4 ±3.6 degrees F	MD 210 lbf/in	XD 210 lbf/in
Tear Strength (ASTM D 5147) 2 in/min. at 73.4 ±3.6 degrees F	MD 250 lbf	XD 250 lbf
Elongation at Maximum Tensile (ASTM D 5147) 2 in/min. @ 73.4 ±3.6°F	MD 4.0 percentage	XD 4.0 percentage

- B. Modified Mineral Cap Sheet:
 - 1. Stressply IV Mineral complying with ASTM D 6163 Type III Grade G
 - 2. Performance Characteristics:

Tensile Strength (ASTM D 5147) 2 in/min. at 73.4 ±3.6 degrees F	MD 210 lbf/in	CMD 210 lbf/in
Tear Strength (ASTM D 5147) 2 in/min. at 73.4 ±3.6 degrees F	MD 250 lbf	CMD 250 lbf
Elongation at Maximum Tensile (ASTM D 5147) 2 in/min. @ 73.4 ±3.6°F	MD 6.0 percentage	CMD 6.0 percentage
Low Temperature Flexibility (ASTM D-5147) Passes -20 degrees F		

- C. Polyurea, White Coating: White Star

1. Performance Characteristics:
 - a. Tensile Strength 2300 psi
 - b. Tear Strength: 230-280 psi
 - c. SRI: 88

2.03 OWNER SUPPLIED MATERIALS

- A. Following quantities are maximum quantities established by roofing system manufacturer (The Garland Company) of OFCI materials which will be provided by Owner to roofing installer:

Product	Amount	Unit Size
HPR Torch Base Sheet	315	Roll
Stressply IV Mineral	412	Roll
Pyramic Plus LO	180	5 Gal
KEE-Lock Mastic	8	5 Gal
Tuff Stuff Caulking	60	Tube
Garla Prime VOC	2	5 Gal
RMER SS Flat Stock	73	4' x 10'

- B. All other roofing products, accessories, substrates, etc. not listed in ~~section 1.4~~ ^{this Section} are to be provided by the Contractor.

2.04 ROOF INSULATION

- A. General: Provide preformed roof insulation boards complying with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
1. Provide polyisocyanurate board 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, unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain.

2.05 INSULATION ACCESSORIES

- A. General: Furnish roofing insulation accessories recommended by insulation manufacturer for intended use and compatible with sheet roofing material.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470.
 - 1. Designed for fastening roofing insulation to substrate.
 - 2. Tested by manufacturer for required pullout strength
 - 3. Acceptable to roofing system manufacturer.
- C. Substrate Joint Tape: 6 or 8 inches wide, coated, glass-fiber joint tape
 - 1. Fabricate to slopes indicated.

2.06 GYPSUM FIBER ROOF BOARD

- A. Roof Board: ASTM C 1278, fiber-reinforced, homogenous composition, water-resistant gypsum substrate, 1/2 inch thick.
 - 1. Product: Subject to compliance with specified requirements, provide Securock Gypsum Fiber Roof Board by USG Corporation, or approved equal, subject to approval of roofing system manufacturer.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion resistance provisions in FMG 4470, designed for fastening roof board to roof deck.

2.07 RELATED MATERIALS

- A. Nails and Fasteners:
 - 1. Non-ferrous metal or galvanized steel.
 - a. Hard copper nails shall be used with copper
 - b. Use aluminum or stainless steel nails with aluminum
 - c. Use stainless steel nails with stainless steel.
 - 2. Fasteners: Self-clinching type of penetrating type as recommended by manufacturer of metal deck.
 - 3. Nails and Fasteners: Flush-driven through flat metal discs of not less than one inch diameter.
 - a. Omit metal discs when one-piece composite nails or fasteners with heads not less than one inch diameter are used.
- B. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition, slip-resisting pads, manufactured as traffic pad for foot traffic and acceptable to roofing system manufacturer.
 - 1. Pad Size: 36 inches by 36 inches, by 3/8 inch thick, minimum.
 - 2. Walkway Pad Adhesive: Adhesive to adhere approved walkway pads.
 - a. As recommended and furnished by roofing system manufacturer.
 - b. Complying with SCAQMD Rule 1168.
- C. Sheet Metal Flashing:
 - 1. Refer to materials and requirements specified in Section 07 6200 for sheet metal flashing materials and installation.
- D. Butyl Tape: 100 percent solids, asbestos free, compressive tape designed to seal as recommended and furnished by membrane manufacturer.
 - 1. Butyl tape is required at terminations.

- E. Sealant: *Tuff-Stuff MS True White*, moisture curing, single component polymer sealant, as supplied by Owner.
 - 1. Comply with requirements of Section 07 9200 and SCAQMD Rule 1168.
- F. Mastic: *Flashing Bond*
- G. GarMesh: 6 inch Mesh for three course application with mastic.
- H. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- I. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- J. Splash Blocks: Reinforced, precast concrete, of size, profile, and thickness shown on Drawings.
 - 1. Design Mix: 2 parts concrete sand, and 1 part cement.
 - a. Limit water content to make mix stiff.
 - 2. Cement: Portland Cement Type I or II gray, conforming to ASTM C 150.
 - 3. Course Aggregate: Carefully graded and washed gravel or stone conforming to ASTM C 33.
 - a. Mix gravel not to exceed 3/8 inch.
 - b. Gradation may vary to achieve desired finish and texture.
 - 4. Fine Aggregate: Carefully graded and washed natural concrete sand conforming to ASTM C 33.
 - a. Gradation may vary to achieve desired finish and texture.
 - 5. Water: Potable water free from impurities.
 - 6. Admixtures: When required, conforming to ASTM C 494.
 - 7. Reinforcing Steel: Conforming to ASTM 615, with deformations conforming to ASTM M 305.
 - a. M13 #4, Grade 60 rebar, and 1/4 inch HR round steel.
 - 8. Strength: Comprehensive strength of 4,000 to 6,000 psi at 28 days depending on mixture and additives, as determined by tests of 6 inch cylinders.
 - 9. Weight: 49 lbs.
 - 10. Color: Manufacturer's standard Gray.
 - 11. Manufacturer: Modern Precast, Inc., Salt Lake City, UT, or approved equal.

- K: Spray apply Title 24 Energy Standards compliant, *Pyramic Plus LO* reflective white coating at 3 gallons/square.
 - a. Power wash roof surface prior to applying coating.
 - b. Ensure there is no moisture on roof surface prior to application of coating.
 - c. Apply the coating in two 1.5 gal per sq. coats.
 - d. Do not apply coating in area where roof paver system is to be installed over roof system.

L: White Coating: *Pyramic Plus LO*

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrate surfaces to receive modified bitumen sheet roofing system and associated work and conditions under which roofing will be installed.

- B. Do not proceed with roofing until unsatisfactory conditions have been corrected in manner acceptable to roofing system manufacturer's representative, roofing installer, and Project Inspector.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Cooperate with roofing system manufacturer's representative and inspection and testing agencies engaged or required to perform services in connection with installing roof system.
- B. Insurance/Code Compliance: Where required, install and test roofing system to comply with governing regulation and specified insurance requirements.
- C. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors.
 - 1. Replace or restore other work damaged by installations of modified bituminous roofing system Work.
- D. Coordinate installing roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight.
- E. Cut-Offs: Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation.
 - 1. Provide temporary covering of two plies of No. 15 organic roofing felt set in full mopping of bitumen with joints and edges sealed or other jointly agreed upon tie-in detail.
 - 2. Remove cut-offs immediately before resuming work.
- F. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building, or damaging roofing system components.
- G. Apply roofing materials as specified herein unless recommended otherwise by roofing system manufacturer's instructions.
 - 1. Keep roofing materials dry before and during application.
 - 2. Do not permit phased construction.
 - 3. Complete application of roofing plies, modified sheet and flashing in continuous operation.
 - 4. Begin and apply only as much roofing in one day as can be completed that same day.
- H. Keep ABC rated fire extinguisher in location per Cal/OSHA requirements
 - 1. Make workers are aware of its location how to operate it properly.

3.03 APPLICATION PROCEDURE TORCH INSTALLATION

- A. Underlayment Installation:
 - 1. Lay out the roll in the course to be followed and unroll 6 feet (1.8 m).
 - 2. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
 - 3. After the major portion of the roll is bonded, re-roll the first 6 feet (1.8 m) and bond it in a similar fashion.
 - 4. Repeat this operation with subsequent rolls with side laps of 4 inches (101 mm) and end laps of 8 inches (203 mm).
 - 5. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.
 - 6. Extend underlayment 2 inches (50 mm) beyond top edges of cants at wall and projection bases.

7. Install base flashing ply to all perimeter and projections details.

B. Modified Membrane Installation:

1. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
2. After the major portion of the roll is bonded, re-roll the first 6 feet (1.8 m) and bond it in a similar fashion.
3. Repeat this operation with subsequent rolls with side laps of 4 inches (101 mm) and end laps of 8 inches (203 mm).
4. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.

C. Flashing Membrane Application:

1. Mechanically fasten torch acceptable sheet or insulation board to all flashing curbs.
2. Torch apply modified flashing base to the underlying base flashing ply. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
3. Solidly adhere the entire sheet of flashing membrane to the substrate. Tops of all flashings that are not run up and over curb shall be secured through termination bar 6 inches (152 mm) and sealed at top
4. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and fiberglass mesh.
5. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work.

D. Application of Surfacing:

1. Prior to installation of surface, obtain approval from coating manufacturer as to Work completed.
2. Water power wash roof prior to surfacing per coating manufacturer's product installation requirements.
 - a. All-purpose Industrial degreaser/cleaner:
 - 1) Simple Green , or approved equal.
3. Besides mastic, roof can be coated immediately upon approval of punch list items.
4. Cure Time: Allow roofing system proper time to cure prior to application of coating.
 - a. System will require 7 days of cure time.
 - b. Mastics will require 30 days of cure time.
5. Reflective Coating:
 - a. White Star:
 - 1) Coat roof field and flashing with Title 24 Energy Standard compliant coating at 2 gallon per square.
 - 2) Embed 200 lbs per sq of Title 24 white grave into the coating.

3.04 SHEET METAL FLASHING AND TRIM INSTALLATION

A. Comply with requirements of Section 07 6200 for flashing materials and installation requirements and as follows:

1. Prefabricated, prefinished sheet metal for coping cap, counter flashing, edge metal, and skirt flashing details, except where stainless steel is indicated.
 - a. Copings: Shall be made of 22-gauge galvanized steel with a Kynar coating. Color to be selected by Owner from standard color chart. Flat Stock sheets to be provided by the Garland Company.
 - b. Sheet Metal Counterflashing/Inserts: Shall be made of 22 gauge galvanized sheet metal, in accordance with detail drawing. Flat Stock sheets to be provided by the Garland Company.

2. Fascia Cover: Tie into edge metal and lap over end of fascia board at 2 inches minimum.
3. Gutters: Where indicated.
4. Stainless steel flashings at penetration points.
 - a. Umbrella cover for stainless steel flashings.

- B. Crickets: Install cricket on high side of mechanical units.
 1. Roofing installer is responsible for positive drainage of water.

- C. Terminate flashing with termination bar set in butyl tape on HVAC units / curbs.
 1. Install 22 gauge, galvanized, coil coated metal counterflashing.

- D. Place new and existing conduit on redwood blocks and walkway pads.

- E. Seal equipment with specified Title 24 coating.
 1. Apply at 2 gallons per square.

- F. Seal duct work seams and corners with three course application of Flashing Bond and Mesh.

- G. Splash Blocks: Install splash blocks in locations shown on Drawings.

3.05 FIELD QUALITY CONTROL

- A. Require attendance of roofing system manufacturer's representatives at Project Site during installation of roofing system.
 1. Roofing system manufacturer's roofing inspector is required to sign off on roofing scope of work indicated in Article 1.05 B.

- B. Roofing System Manufacture's Responsibilities:
 1. While roofing work is in progress, roofing system manufacturer will provide inspections in accordance with following:
 - a. Perform Project Site inspections for minimum of four days per week.
 - b. Keep Owner and Architect informed as to progress and quality of Work observed.
 - c. Report to Owner and Architect, in writing, failure or refusal of roofing installer to correct unacceptable practices called to roofing installer's attention.

- C. Roofing Installer's Responsibilities:
 1. Comply with requirements of Roofing Inspector provided by roofing system manufacturer.
 2. Keep Roofing Inspector, Project Inspector, Architect, and Owner informed regarding issues and concerns.
 3. Confirm after completion that manufacturer has observed no application procedures in conflict with specifications other than those that may have been previously reported and corrected.

3.06 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with roofing installer, installer of associated work, Owner, Architect, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.

- B. Inspect roof surface areas of building, including perimeter building edges, flashing of roof penetrations, walls, curbs and other equipment.

1. List items requiring correction or completion and furnish copy of list to each party attending
- C. Owner reserves right to request thermographic scan of roof during final inspection to determine if damp or wet materials have been installed.
 1. Should defects be discovered, roofing installer shall correct and fix defective areas at no charge to Owner.
- D. Should core cuts verify presence of damp or wet materials, roofing installer shall be required to replace damaged areas at his own expense.
- E. Repair or replace, as required, deteriorated or defective work found at time above inspection, to condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- F. Roofing installer is to notify Owner upon completion of corrections.
- G. Following final inspection, acceptance will be made in writing by roofing system manufacturer.
 1. Roofing installer shall provide needed coordination for providing such approval.
- H. Comply with specified closeout procedures in Section 01 7700.

3.07 CLEANING

- A. Remove drippage of bitumen from walls, windows, floors, ladders and finished surfaces.
- B. In areas where finished surfaces are soiled by asphalt or other sources of soiling caused by roofing work, consult manufacturer of surfaces for cleaning advice and conform to their instructions.
- C. Roofing installer is not to use Owner's rubbish bins.
 1. Remove used material containers and dispose of off Project Site.
 2. Comply with requirements of Section 01 7419.

END OF SECTION 07 5216