SPECIFICATIONS

For

ROOF REPAIRS
AT
BONITA HIGH SCHOOL, CENTRAL KITCHEN & TRANSPORTATION

BOOK 2

Bid No. 15-16:01

BID OPENS: Friday, April 10, 2015 @ 2:00 p.m.

SECTION 07 52 16.13 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Tear-off and properly dispose of existing roof systems, insulations, roofing accessories, metal flashings, obsolete equipment, and identified equipment on the identified sections at the District Office Transporation and Central Kitchen buildings, and the Bonita High School Student Center.

2. Installation of Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing system including but not limited to:

    1) One layer of red rosin sheet.
    2) ½ inch wood fiber board over concrete decks
    3) One Powerply HT base sheet.
    4) Two Thermglass IV ply sheets.
    5) One Powerply Standard FR cap sheet.
    6) Rock-It and Gravel Surfacing.
    7) TPA flashings.
    8) Gutters and Downspouts
    9) Tapered Insulation
    10) Color Coat surfacing.

3. Unit Costs:

    a. Plywood deck replacement per 4” x 8” sheet

1.3 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 roofing work in this Section.

B. Cold Process Built Up Roofing – An asbestos free formulation of asphalt, solvent, thixotrope, mineral stabilizer and reinforcing fibers used as an interply adhesive.

C. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mopping application and 75 centipoise for mechanical application, within a range of plus or minus 25 deg F (14 deg C), measured at the mop cart or mechanical spreader immediately before application.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane 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. Membrane 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 membrane roofing manufacturer based on testing and field experience.

C. Roofing Membrane System Load-Strain Properties – Specified Over Wood Decks: Provide a roofing membrane identical to component systems that have been successfully tested by a qualified independent testing and inspecting agency to meet the following minimum load-strain properties at membrane failure when tested according to ASTM D 2523:

1. Tensile strain at failure, at 73 dg F: 495 lbf/in machine direction, minimum; 3.37% percent elongation, maximum.

2. Tensile strain at failure, at 73 dg F: 450 lbf/in cross-machine direction, minimum; 3.47% percent elongation, maximum.

Fire-Test-Response Characteristics: Provide roofing systems that have a UL Class A fire rating.

D. Flashings and Fastening: Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:

1. FMG 1-49: Loss Prevention Data Sheet for Perimeter Flashings.

2. FMG 1-29 rev. May 2005: Loss Prevention Data Sheet for Above Deck Roof Components.

3. NRCA Roofing and Waterproofing Manual (Fifth Edition) for construction details and recommendations.

4. SMACNA Architectural Sheet Metal Manual (Fifth Edition) for construction details.

E. Energy Performance: Provide roofing system with initial Solar Reflectance not less than 0.70 and Thermal Emittance not less than 0.75 when tested according to Cool Roof Rating Council's CRRC-1.

1.5 ACTION SUBMITTALS

A. Product Data and MSDS Sheets: For each type of product specified.

1. Highlight characteristics that confirm compliance with specified products.

B. Samples in the following quantities:

1. 3-by-5 inch sample of roof base sheet.

2. 3-by-5 inch sample of roof ply sheet.

3. 3-by-5 inch sample of roof cap sheet.

4. 3-by-5 inch sample of flashing membrane.

5. 3-by-5 inch sample of stripping ply.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Qualification Data: For Installer and Roofing Inspector. Include letter from Manufacturer written for this Project indicating approval.

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

1. Submit evidence of compliance with performance requirements, including roofing membrane system load/strain property test report.

2. Indicate that proposed system components are compatible.

D. 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.

E. Warranties: Sample of special warranties.

F. Inspection Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For built-up roofing to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years experience installing similar work, and qualified by the manufacturer to furnish warranty of type specified.

1. Installer must acquire twelve (12) inspection service days utilizing manufacturer's technical inspectors. Inspector must be present for roof removal, deck preparation, base sheet installation, cap sheet installation, and coating installation.

B. Manufacturer Qualifications: A qualified manufacturer that is UL listed for built-up roofing identical to that used for this Project.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

D. Source Limitations: Obtain roofing system components from or approved in writing by roofing system manufacturer.

E. Exterior Fire-Test Exposure: UL Class A; as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified 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, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review 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 system.

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

8. Review temporary protection requirements for roofing system during and after installation.

9. Review roof observation and repair procedures after roofing installation.

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

1. Meet with Owner, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review 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 system.

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

8. Review temporary protection requirements for roofing system during and after installation.

9. Review roof observation and repair procedures after roofing installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. Field measurements and material quantities:

1. Contractor shall have sole responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

C. Waste Disposal:

1. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.

D. Safety requirements:

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.

2. Comply with federal, state, local and Owner fire and safety requirements.

3. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.

4. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, fuels, solvents, torches, and open flames are being used.

1.11 WARRANTY

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

B. Roof System Warranty, General: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:

1. Sheet metal flashing and trim, including roof penetration flashings.

2. Roof curbs, hatches, and penetration flashings.

3. Roof and parapet expansion joint assemblies.

C. Special Warranty: Manufacturer's standard or customized form, in which manufacturer agrees to repair or replace components of built-up and single ply roofing that fail in materials or workmanship within specified warranty period. One manufacturer must provide the warranty for all roof sections. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover boards, walkway products, and other components of built-up roofing.

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

D. Installer's Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, metal panels, and walkway products, for the following warranty period:

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

PART 2 - PRODUCTS

2.1 GENERAL

A. 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. All products are also ‘or equal’. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1 and performance requirements in Part 2.

B. Any materials substituted must be done 7 days prior to bid to allow for all contractors to bid substituted product. All substitutions must be submitted to the District on provided substitution form.

2.2 SBS-MODIFIED ASPHALT-SHEET MANUFACTURERS

A. The roof system specified in this Section is based upon Tremco, Inc. products named in other Part 2 articles.

2.3 BASE-SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m.)

B. Base Sheet: SBS-modified, asphalt-coated base sheet reinforced with a composite glass fiber mat / glass fiber scrim / polyester mat and dusted with fine mineral surfacing on both sides which meets the following properties:

1. Powerply HT Base Sheet.

2. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D 5147: machine direction, 150 lbf/in (26.3 kN/m); cross machine direction, 150 lbf/in (26.3 kN/m).

3. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 5147: machine direction, 200 lbf (0.9 kN); cross-machine direction, 180 lbf (0.8 kN).

4. Low Temperature Flexibility, minimum, ASTM D 5147: -15 deg. F (-26 deg. C).

5. Thickness, minimum, ASTM D 5147: 0.060 inch (1.5 mm).

6. Mass of Desaturated Reinforcement, minimum, ASTM D 228: 2.5 lb/100 sq. ft. (120 g/sq. m.)

2.4 ROOFING MEMBRANE PLY SHEETS

A. Ply Sheet: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt, with the following properties:

1. Thermglass IV ply sheet.

2. Breaking Strength, minimum, ASTM D 146: machine direction, 44 lbf/in (10.5 kN/m); cross machine direction, 44 lbf/in (7.8 kN/m).

2.5 ROOFING MEMBRANE CAP SHEETS, SBS-MODIFIED BITUMEN

A. Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified, and as follows:

1. Powerply Standard FR.

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

3. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: machine direction 80.0 lbf/in (14.0 kN/m); cross machine direction 70.0 lbf/in (12.0 kN/m).

4. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: machine direction, 100 lbf (440 N); cross machine direction 100 lbf (440 N).

5. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: machine direction 7.5 percent; cross machine direction 7.5 percent.

6. Low Temperature Flex, maximum, ASTM D 5147: -15 deg. F (-26 deg. C).

7. Thickness, minimum, ASTM D 5147: 0.120 inch (3 mm).

2.6 GRAVEL SURFACING

A. Surfacing Adhesive: One-part, white, highly reflective polymeric, surfacing adhesive, CRRC listed and California Title 24 Energy Code compliant when combined with selected white marble aggregate, with following physical properties:

1. Rock-It Adhesive.
2. Asbestos Content, EPA 600 R-93/116: None.
3. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.
4. Nonvolatile Matter, minimum ASTM D 6511: 54 percent.
5. Flash Point, minimum, ASTM D 93: 120 deg. F (49 deg. C).
6. Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.
7. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.

B. Surfacing Aggregate

1. Tremco/A-1 Grit Snow White Roofing Aggregate

2.7 FLASHING MATERIALS

A. Base Flashing Sheet: ASTM D 4434, Type IV, internally fabric reinforced, uniform, flexible TPA sheet, CRRC listed and California Title 24 Energy Code compliant.

1. TPA Flashing Sheet.
2. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 300 lbf/in (52 kN/m).
3. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (0.44 kN).
4. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: machine direction, 25 percent; cross machine direction, 25 percent.
5. Thickness: 45 mils, nominal.
6. Exposed Face Color: White.
7. Reflectance, ASTM C 1549: 86 percent.
8. Thermal Emittance, ASTM C 1371: .86.
9. Solar Reflectance Index (SRI), ASTM E 1980: 108

B. Stripping/Target Ply Sheet: Non-woven, heat resistant, polyester sheet, with the following properties:

1. Polytherm Stripping Ply.

2. Breaking Load at 77 deg. F (25 deg. C), minimum, ASTM D 4830: machine direction, 150 lbf (667 N); cross-machine direction, 130 lbf (40.3 kN/m).

3. Trapezoid Tearing Strength, minimum, ASTM D 4830: machine direction, 60 lbf (267 N); cross-machine direction, 60 lbf (1.7 kN).

4. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 4830: machine direction, 30 percent; cross-machine direction, 30 percent.

5. Thickness, minimum, ASTM D 1777: 0.035 inch (1.2 mm).

6. Weight, minimum, ASTM D 3776: 5.5 oz./sq. ft (1.4 kg/sq. m.).

C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

D. Flashing Membrane Bonding Adhesive, Low VOC: Elastomeric, low-VOC solvent-based contact-type adhesive for bonding TPA fleece-backed single ply membranes and flashings to substrates.

1. TPA LV Bonding Adhesive.

2. Asbestos Content, EPA/600/R-93/116: None.

3. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1475: 7.0 lb/gal (0.84 kg/L).

4. Percent solids: 25 percent minimum.

5. VOC, maximum, ASTM D 3960: 200 g/L.

E. Water-Based Asphalt Primer: Water-based, polymer modified, asphalt primer with the following physical properties:

1. Tremprime WB.

2. Asbestos Content, EPA 600/R13/116: None.

3. Non-Volatile Content, minimum, ASTM D 2823: 30 percent.

4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 2 g/L.

F. Asphalt Roofing Mastic: ASTM D 4586, Type II, Class 1, one-part, asbestos-free, cold-applied mastic specially formulated for compatibility and use with specified roofing membranes and flashings, with the following properties:

1. ELS.

2. Asbestos Content, ASTM D 276: None.

3. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 234 g/L.

4. Nonvolatile Matter, minimum, ASTM D 4586: 85 percent.

5. Density at 77 deg. F (25 deg. C), ASTM D 1475: 9.5 lb/gal (1.15 kg/L).

6. Resistance to Sag, maximum, ASTM D 4586: 1/8 inch (3.1 mm).

7. Viscosity at 77 deg. F (25 deg. C), ASTM D 2196: 480,000 to 1,000,000 cP (480 to 1,000 Pa*s).

8. Moisture Vapor Transmission, ASTM E 398: 0.25 g/100 sq. in./24 hr at 0.020 in. thickness, average.

G. Flashing Sheet Stripping Adhesive: One-part, white, highly reflective polymeric, surfacing adhesive, CRRC listed and California Title 24 Energy Code compliant when combined with selected white marble aggregate, with following physical properties:

1. Rock-It Adhesive.

2. Asbestos Content, EPA 600 R-93/116: None.

3. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.

4. Nonvolatile Matter, minimum ASTM D 6511: 54 percent.

5. Flash Point, minimum, ASTM D 93: 120 deg. F (49 deg. C).

6. Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.

7. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.

H. Solvent-Free Elastomeric Roofing Mastic: One-part, solvent-free, asbestos-free, low-odor elastomeric roof mastic specially formulated for compatibility and use with specified roofing membranes and flashings, with the following properties:

1. Tremco, Polyroof SF.

2. Asbestos Content, EPA 600/R13/116: None.

3. Nonvolatile Matter, minimum, ASTM D 4586: 70 percent.

4. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 412: 1000 percent.

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

6. Flexibility at -40 deg. F (-40 deg. C), ASTM D 3111: No cracking.

I. TF Tape: manufacturer’s term bar sealant.

J. General purpose sealant: Solvent free, low odor urethane sealant.

1. Tremseal Pitch Pocket Sealer.

K. Urethane sealant: manufacturer’s gun grade, moisture cured, one component polyurethane sealant.

1. Tremseal D.

2. Hardness (Shore A), ASTM C 920-02: 40.

3. Bond Durability, ASTM C 920-02: Pass.

4. Stain and Color Change, ASTM C 920-02: None.

5. Accelerated Weathering, ASTM C 920-02: Pass.

6. VOC, ASTM D 3960-02: 85 g/L.

L. Silicone sealant: manufacturer's low modulus, high performance, one part moisture curing silicone joint sealant.

1. Tremseal S.

2. Tensile Strength at maximum elongation, ASTM D 412-87: 200 psi.

3. Tear Resistance (Die C), ASTM D 624-86: 40 pli.

4. Stain and Color Change, ASTM C 510-77: None.

5. UV Resistance, ASTM C794-80: Excellent.

6. VOC, ASTM D 3960-02:0 g/L (less water, less exempt solvent)

M. Urethane Sealant Primer: One part, resin-based primer formulated to prepare concrete and masonry surfaces for the application of urethane sealants, with the following physical properties:

1. Primer #1.

2. Non-Volatile Content, minimum, ASTM D 2369: 30 percent.

3. Flash Point, minimum, ASTM D 93: 80 deg. F (27 deg. C).

4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 670 g/L.

5. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1875: 8.25 lb/gal (988 g/L).

N. Urethane Sealant Primer: One part primer formulated to prepare metal and plastic surfaces for the application of urethane sealants, with the following physical properties:

1. Non-Porous Primer.

2. Non-Volatile Content, minimum, ASTM D 2369: 5 percent.

3. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 233 g/L.

4. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1875: 8.3 lb/gal (1000 g/L).

O. Silicone Sealant Primer: One part, silicone-based primer formulated to prepare metal surfaces for the application of silicone sealants, with the following physical properties:

1. Primer #10.

2. Non-Volatile Content, minimum, ASTM D 1644: 10 percent.

3. Flash Point, minimum, ASTM D 56: 0 deg. F (-18 deg. C).

4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 678 g/L.

5. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1875: 6.8 lb/gal (814 g/L).

P. Silicone Sealant Primer: One part, silicone-based primer formulated to prepare porous concrete and masonry substrates for the application of silicone sealants, with the following physical properties:

1. Primer #23.

2. Non-Volatile Content, minimum, ASTM D 1644: 25 percent.

3. Flash Point, minimum, ASTM D 56: 44 deg. F (-6.7 deg. C).

4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 715 g/L.

5. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1875: 7.9 lb/gal (946 g/L).

2.8 ADHESIVE MATERIALS

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

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

Tapered Insulation/Saddles/Cricket insulation adhesive: ASTMD 312, Type IV, hot-melt asphalt.

2. Premium IV asphalt.

B. Hot Applied Ply and Hot Applied Stripping Ply Adhesive: ASTM D 312, Type IV, hot-melt asphalt, with the following physical properties:

1. Premium IV.

2. Softening Point, min/max, ASTM D 36: 215-225 deg. F (102–107 deg. C).

3. Penetration at 77 deg. F (25 deg. C), min/max, ASTM D 5: 15-30 dmm.

4. Flash point, minimum, ASTM D 92: 525 deg. F (274 deg. C).

5. Ductility at 77 deg. F (25 deg. C), minimum, ASTM D 113: 2.5 cm.

C. Cap Sheet Adhesive: One-part, asbestos-free, low-volatile, cold-applied adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following physical properties:

1. Powerply Standard Cold Adhesive LV.

2. Asbestos Content, EPA 600 R-93/116: None.

3. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: <250 g/L.

4. Nonvolatile Content, minimum, ASTM D 6511: 75 percent.

5. Flash Point, minimum, ASTM D 93: 100 deg. F (38 deg. C).

6. Density at 77 deg. F (25 deg. C), ASTM D 6511: 8.0 lb/gal (950 g/L).

7. Uniformity and Consistency, ASTM D 6511: Pass.

8. Asphalt Content, minimum, ASTM D 6511: 40 percent.

2.9 AUXILIARY ROOFING MEMBRANE MATERIALS

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

B. Fasteners: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

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

2.10 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Wood Fiber Cover board: ASTM C208, Type II, Grade 2, Cellulosic-fiber and water resistant binders, asphalt coated on all six sides and chemically treated for deterioration.

1. Thickness: ½”

2. Maximum board size for adhered insulation: 4’ x 4’

C. Provide preformed tapered insulation, saddles, crickets, tapered edge strips, and other insulation shapes for sloping to drain and at transitions. Include on the high side of all curbs. Use individual pieces no greater than 2 ½” thick.

1. 1/4:12 inch slope min. over entire roof surface.

2. Polyisocyanurate cricket material with 1/2 inch thick wood-fiber cover board. All boards must be asphalt coated on all sides.

2.11 INSULATION ACCESSORIES

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

B. Fasteners: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

D. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

E. Substrate Joint Tape: 6- or 8-inch-(150- or 200-mm-) wide, coated, glass-fiber joint tape.

2.12 WOOD BLOCKING AND CURBS

A. Lumber:

1. Douglas Fur free from warping and visible decay; pressure-treated with chromated copper arsenate (CCA) to meet AWPB, LP-22, 0.40 retention, and marked.

   a. Wood nailers: match insulation height x 6" minimum.

   b. Curb height: minimum 8" off finished roof surface.

B. Plywood sheathing:

1. APA C-D, Plugged and Touch Sanded, Exposure 1, PS 1-83.

2. Thickness: match existing.

C. Woodfiber cant: 4" x 4".

2.13 METAL FLASHINGS

A. Metal edge flashing:

1. Twenty-four (24) gauge minimum, Galvwash, ready to paint steel; commercial quality, Fed. Spec. QQ-S-775, Type I, Class D or ASTM A 526 or lock forming quality ASTM A 52.

   a. Rise: ¼".

   b. Fascia: extend ½" longer than existing edge metal line. Match where metal extends down the entire fascia.

B. Termination bar:

1. Aluminum bar:

   a. 1/8 x 1 inch (3.2 x 25.4 mm).

C. Counterflashing and counterflashing extensions:

1. General: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated.

2. Galvanized Steel Sheet: ASTM A526, G90, commercial quality, or ASTM A527, G90, lock-forming quality, hot-dip galvanized steel sheet with 0.20 percent copper.

   a. Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

3. Masonry Type: Provide with offset top flange for embedment in masonry mortar joints.

4. Counterflashing Wind-Restraint Clips: Provide hold down clips with 1/2 inch (12.7 mm) kickout to be installed before counterflashing to prevent wind uplift on the counterflashing lower edge. Fabricate the clips of the following materials:

a. Galvanized Steel: 22 gage; 0.0336 inch (0.8534 mm) thick.

D. Piping through roof box and T-tops:

1. Galvanized Steel: ASTM A 526-85, sheet steel with 1.25 oz./sq. (3.82 g/m^2) Galvwash surfacing.

a. Gauge: Twenty-four (24).

b. Solder: ASTM B32-89, alloy grade 50A. Neutralize flux after soldering.

2. T-Tops must have sides and screens.

E. Lead Flashings:

1. ASTM B 29-79 (84), four lb. sheet lead.

F. Drains:

1. Zurn or equal.

G. Scuppers:

1. TPA Clad metal scuppers.

H. Work shall be in accordance with Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

2.14 MECHANICAL FASTENERS

A. Base sheet to wood deck:

1. Nails: Spiral or annular ring shank, twelve (12) gage minimum, with integral one (1) inch round cap.

2. Acceptable manufacturers:

a. National Nail Corp., Grand Rapids, MI.

b. Simplex Nails, Inc., Americus, GA.

B. Wood to wood:

1. Galvanized, common, annular ring nail.

2. Length: Sufficient to penetrate underlay blocking 1-1/4 inches (32 mm).

C. Wood to masonry:

1. Anchor bolts, 1/2 inch (12.7 mm) diameter with 5/8 inch (15.9 mm) washer.

D. Galvanized sheet steel to wood blocking:

1. FS FF-N-105B(3) Type II, Style 20, roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.

2. Length: Sufficient to penetrate wood blocking 1-1/4 inches (32 mm) minimum.

E. Galvanized sheet steel to galvanized sheet metal (Counterflashing extensions):

1. Self-tapping sheet metal screws of 1/2 inch length and a minimum #3 diameter, with 5/8" steel/EPDM washer under head.

F. Termination bar to masonry:

1. Lead masonry anchors.

2. Length: Sufficient to provide 1-1/4 inches (32 mm) embedment minimum.

G. Drawband:

1. Gold Seal stainless steel worm gear clamp by Murray Corporation, Cockeysville, MD.

2. Power-Seal stainless steel worm drive clamps by Breeze Clamp Company, Saltsburg, PA.

2.15 COATING MATERIALS

A. White Roof Coating Primer:

1. Tremco SP Primer

B. White Roof Coating: Non-fibrated, semi-gloss, water-based acrylic roof coating, with the following physical properties:

1. Tremco Color Coat.

2. Asbestos Content, EPA/600/R-93/116: None.

3. Non-Volatile Content (by weight), minimum, ASTM D 1644: 48.3 percent.

4. Volatile Organic Compounds (VOC), ASTM D 3960: <50 g/L.

5. Density at 77 deg F (25 deg. C) minimum, ASTM D 1475: 9.4 lbs/gal.

6. Reflectance, minimum, ASTM C 1549: 70 percent.

7. Emissivity, minimum, ASTM C 1370: 0.75.

2.16 WALKWAYS AND RUBBER BLOCKS

A. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition, slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 1/2 inch thick, minimum, with the following physical properties:

1. Trem-Tred.

2. Flexural Strength at max. load, minimum, ASTM C 203: 218 psi (1.5 kPa).

3. Granule adhesion (weight loss), maximum, ASTM D 4977: 1.1 gram.

4. Impact Resistance at 77 deg. F (25 deg. C), ASTM D 3746: No Damage to Roof.

B. Rubber Blocks: 100% rubber blocks with steel channels and reflective strips designed for supporting conduit.

1. Dura-Blok or equal.

PART 3 - EXECUTION

3.1 REMOVAL AND EXAMINATION

A. Remove and properly dispose of existing roofing, insulation, related roofing materials, flashings, abandon curbs and pipes, and any owner identified equipment to leave all portions of the building decks in a fit condition to have new roof system installed.

1. Install new supports and plywood decking where curbs and other penetrations are removed.

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

B. All rotted or deteriorated wood shall be removed and replaced. Deck type and attachment shall conform to local code requirements. Fastener heads shall be recessed into the wood surface.

1. Wood deck repairs:

a. Remove loose nails and pound down all high nails.

b. Reattach loose panels at 6 inches o.c. at edges; 12 inches o.c. at intermediate supports.

c. Remove deteriorated deck panels. Examine joists for rot. If unsound, contact Owner immediately for additional action.

d. Attach new decking 6 inches o.c. at edges; 12 inches o.c. at intermediate supports.

e. Provide 1/8 inch (3.2 mm) gap between panels at panel edges.

C. Substrate inspection:

1. The Applicator shall inspect the substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect the quality of work.

2. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.

3. Verify that roof openings and penetrations are in place and braced and that roof drains are securely clamped in place.

4. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that the nailers match thicknesses of insulation.

5. Use sheet metal to cover any irregularities in the wood deck.

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

7. All broken and disconnected conduits must be reattached and repaired by the Applicator.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Protection:

1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.

2. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.

3. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each work day or before arrival of inclement weather.

4. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.

5. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.

6. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Spilled or scattered debris shall be cleaned up immediately. Removed material to be disposed from roof as it accumulates.

7. At end of each working day, seal removal areas with water stops along edges to prevent water entry.

8. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s recommendations. Have specification and product data sheets on the job site.

B. Start installation of built-up roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing built-up roofing system.

D. Coordinate installing roofing system components so insulation and roofing membrane sheets are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing mastic with joints and edges sealed.

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

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

E. Cold Process Asphalt Heating

1. An in-line heat exchange unit may be used to facilitate application

a. Do not exceed maximum adhesive temperature of 100° F.

2. Heat exchange unit: Use heat transfer oil approved by heating equipment manufacturer.

3. Follow operation procedures recommended by heating equipment manufacturer.

F. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mopping application and 75 centipoise for mechanical application, within a range of plus or minus 25 deg F (14 deg C), measured at the mop cart or mechanical spreader immediately before application.

G. Details not addressed in specification shall be in accordance with NRCA Manual Plates and recommendations, and the Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

3.4 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installing roof insulation.

C. Install new ½ inch perimeter nailers along all concrete deck roof edges.

1. Secure nailers at 18 inches on center using wood to concrete fasteners.

D. Install ½ wood fiberboard insulation on concrete roof decks at Bonita High School Student Center.

1. Set each layer of insulation in Type IV hot asphalt at a coverage rate of 30lbs per square.

2. Immediately walk in insulation to insure full adhesion.

3. Fill all gaps greater than ¼”.

4. Install tapered edge strips to insure a smooth transition between any deck changes or uneven areas.

E. Tapered Insulation Installation at District Office Transportation Building and at Bonita High School Student Center:

1. Install crickets and tapered insulation over installed base sheet with long joints in continuous straight lines with end joints staggered between rows. Stagger joints from joints in substrate below a minimum of 6 inches in each direction.

2. Install crickets and tapered insulation to ensure ¼" minimum slope to drain over entire roof surface.

3. Install crickets between all drain and scupper locations.

4. Set each layer of insulation in Type IV hot asphalt at a coverage rate of 30lbs per square.

5. Immediately walk in insulation to insure full adhesion.

6. Fill all gaps greater than ¼".

7. Install tapered edge strips to insure a smooth transition between any deck changes or uneven areas.

3.5 BASE-SHEET INSTALLATION

1. Install lapped base-sheet course, extending sheet over and terminations and beyond cants.

1. Attach base sheet as follows over wood decks:

a. Mechanically fasten over rosin sheet at 9 inches on center along the base ply 4 inch overlap and in two rows at 18 inches on center equally spaced and staggered in the field of the sheet.

3.6 PLY SHEET INSTALLATION

A. Over mechanically attached base sheet and installed tapered insulation/saddles/crickets install two lapped course of roofing membrane ply sheet, extending sheet over terminations and above cants. Install in shingle fashion.

1. Embed ply sheet in a solid mopping of hot-asphalt applied at rate of 25 lbs/100 sq. ft., to form a uniform membrane without ply sheets touching.

2. Install a third ply sheet over all ridges and through all valleys and waterways.

3. Immediately broom each ply sheet with a ply width broom to insure full adhesion without voids

B. Over installed wood fiberboard on concrete decks install three lapped courses of roofing membrane ply sheet, extending over terminations and beyond cants. Install in shingle fashion.

1. Embed ply sheet in a solid mopping of hot-asphalt applied at rate of 25 lbs/100 sq. ft., to form a uniform membrane without ply sheets touching.

2. Immediately broom each ply sheet with a ply width broom to insure full adhesion without voids

3.7 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

2. Embed cap sheet in cold-applied membrane adhesive applied at a rate of 2.0 gals/100 sq. ft.

3. At end of day use 75lb. single ply roller to roll in all cap sheet installed that day. Roll towards end laps.

4. Apply Tremseal Pitch Pocket Filler in the gap between edge metal and edge of modified membrane.

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

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

3.8 GRAVEL SUFACING INSTALLATION:

A. Install flood coat of Rock It sufcaing adhesive at a coverage rate of 5 gallons per 100 sq.ft.

B. Immediately broadcast gravel into flood coat at a rate of 200lbs. per 100sq.ft.

3.9 FLASHING

A. General flashing requirements:

1. Elastomeric Flashing:

a. Adhere TPA completely to flashing surface, cant, and roofing with flashing adhesive. Prime surface as required. Apply adhesive in full coverage to both the substrate and to the back side of the flashing membrane. Allow adhesive to dry to the touch.

b. Apply consistent pressure to entire surface of TPA using a steel hand roller to achieve full adhesion of the sheet to the flashing substrate. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 4 inches. Fully heat weld flashing laps.

c. TPA width: Sufficient to extend at least 6 inches beyond toe of cant onto new roof.

d. Seal horizontal edge of TPA with a five-course application of Rock-It Adhesive and fiberglass reinforcement.

e. Seal vertical edge under counterflashings with Termination bar and TF tape secured at 8" o.c. and a skirt metal with TF tape secured at 8" o.c. at curbs.

f. Secure TPA under existing flanges of expansion joint covers and non-removable metal components using skirt metal and TF tape. All skirt metal shall be of sufficient size to extend a minimum of 4 inches down from attachment to TPA. Skirt metal to be fastened with screws with neoprene washers a minimum of 8 inches o.c. and each screw must fully engage all metal components, the flashing sheet and the substrate.

2. Hot air heat welding of TPA:

a. Wipe both sides of lap surfaces to be joined with solvent approved by manufacturer.

b. Adjust welding equipment air temperature prior to start. Utilize steel roller or weighted wheel on automatic welding equipment to provide pressure on lap area during heat welding.

c. Maintain air nozzle temperature, nozzle speed, and lap pressure when joining laps together.

d. Test lap areas to assure proper bonding. Remove lap sample from the roof. When lap sample is cool, pull test lap apart. When torn, the reinforcing scrim should become exposed. Patch test areas with new TPA of the same color and style, using a minimum 2" lap area.

e. Wipe top of lap seams with approved solvent and apply silicone sealant. Tool sealant to a coved bead.

3. Base flashing height:

a. Not less than 8 inches without manufacturer's written approval. If height of base flashing exceeds 24 inches, a battan bar with TF tape must be installed at the midpoint of the sheet. Heat weld a strip of TPA over the batten bar.

4. Two-Ply Stripping for metal flanges:

a. Set flange in modified mastic. Seal flange with two stripping plies embedded in specified adhesive. Extend first ply a minimum 8 inches beyond flange and the second 14 inches. Carefully rub in the ply to insure complete adhesion.

B. Edge Detail:

1. Install nailers to match insulation if present. Extend base sheet over nailers.

2. Envelope felts.

3. Prior to setting and nailing horizontal flanges of metal edge flashing, trowel 1/16 inch uniformly thick layer of modified mastic to roofing surface receiving metal flange.

4. Fabricate and install metal edge flashing with formed drip edge incorporating 3/4 inch lock. Grind kynar finish off edge metal flange.

5. Secure fascia bottom with 3/4 inch lock to continuous cleat nailed with 1 ½" long galvanized steel roofing nails at 6 inches o.c. Cleat shall be 1 gauge heavier than fascia and have a maximum flange width of 1 inch.

a. Gap fascia ends 1/2 inch; overlap cleat joints - 1 inch. Set flange in modified mastic. Cover fascia ends with cover plate profiled to fascia. Set cover in elastomeric mastic; nail to wood blocking through gap between fascia joints.

6. Nail interior portion of flange to wood blocking or wood decking with 2" long galvanized steel roofing nails at 3 inches o.c., staggered ½".

7. Prime metal flange with asphalt primer.

8. Install stripping for metal flanges as described in general flashing requirements section.

C. Gutters:

1. Fabricate a new 16" girth gutter, supported by brackets, reinforced with internal straps, and complete with outlet drainage tubes.

a. 24 gauge metal gutter with kynar finish. District to select from standard color selection.

2. Extend a dry base sheet from roof surface edge down onto vertical face behind where gutter will be placed.

3. Mechanically attach 10 gauge gutter brackets using two 2" screws per bracket to the outside face of the wall 36 inches o. c.. Install gutter onto brackets and slope gutter to outlets. Powder coat brackets to match gutter.

4. Install 16 gauge galvanized internal straps every 36 inches o. c.

5. Lap gutter section joints 1 inch minimum and lap in the direction of flow so as not to impede the flow of water. Rivet 2 inches o. c. and cover with Polytape.

6. Install gutter expansion joints every 50 feet, minimum.

7. Install edge detail as described above without the continuous cleat.

8. Install 4 inch, 16 gauge steel downspouts supported by 10 gauge brackets leading to the ground. Elbow out to direct water away from building. Powder coat to match coping.

D. At walls with coping:

1. Install TPA as described in general flashing section.

2. Cover wall with TPA and extend under existing coping metal interior face.

3. Install skirt metal between coping metal and TPA flashing sheet and secure with fasteners and neoprene washers at 8 inches on center.

a. Each fastener must engage coping metal, skirt metal, TPA flashing sheet and substrate.

E. Curb flashings:

1. Add to existing wood curbs or construct new curbs to achieve minimum 8" height with proper wood nailers. As needed, install new plywood and supports to create substrate necessary for proper flashing.

a. Fully adhere TPA over the top of curbs that receive sheet metal pans.

b. Secure substrate board to metal curbs to match wood nailer.

c. Bring TPA up duct work a minimum of 8 inches.

2. Install new roofing to top edge of cant. Nail 8 inches o.c. with annular nails, with a 1 inch cap.

3. Install elastomeric flashing sheet as described in general flashing requirements section.

4. Secure top edge of flashing membrane to vertical substrate with skirt metal and one layer of TF tape secured 8 inches o.c. maximum.

5. Wipe top of bar clean with metal cleaner. Prime metal surface to receive sealant with metal primer. Allow to dry.

6. Caulk top of bar with polyurethane sealant. Provide watershed. Tool neatly.

7. Seal all holes, screws, and penetrations on equipment with polyurethane sealant.

F. Plumbing vents and pipe penetrations:

1. Wedge plumbing vent and pipe penetrations tight against deck.

2. Apply 1/16 inch uniformly thick layer of mastic to surface receiving metal flange.

3. Fabricate and install flashing from lead. Flange: 4 inches wide minimum; extend completely around periphery of pipe. Neatly dress flange with wood block.

4. Prime both sides of metal flange with asphalt primer.

a. Plumbing vent pipe outside diameter greater than 2 inches: Bend lead inside pipe 1 inch (25 mm) minimum with pliers or rubber/plastic mallet; replace cracked lead.

b. Plumbing vent pipe outside diameter 2 inches or less: Cut lead at vent top; fabricate and install integral lead cap.

c. Through pipes/conduits shall be counter flashed with TPA storm collars. Apply Tremflash tape and secure with stainless steel clamp. Prime and seal the top of the collar with polyurethane sealant.

5. Install stripping for metal flanges as described in general flashing requirements section.

6. Install pelican hood, NRCA MB-16, for multiple pipes coming through the deck in the same location.

G. T-Tops:

1. Replace indentified vents with new T-Tops with closed sides and screens.

2. Prime base and set in a bed of mastic.

3. Secure with screws at 4” o.c..

4. Install two (2) ply stripping for metal flanges as described in general flashing requirements section.

H. Scuppers

1. Fabricate and install new TPA clad metal scuppers.

2. Seal outside perimeter of new scuppers with polyurethane sealant.

I. Drains: Set new 30-by-30-inch 4 lb lead metal flashing in bed of asphalt mastic on completed roofing membrane. Install stripping for metal flanges as described in general flashing requirements section. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

1. Contractor is to complete a water test of all drain plumbing prior to new roof installation. If any broken components or drainage problems are discovered, notify the District in writing prior to installing roof system.

2. Reuse existing drain assemblies. Replace any broken or missing components including drain rings, bolts, and cast iron drain screens.

3. Install tapered insulation in drain sumps to ensure ¼ inch slope to drain minimum.

4. Install two ply stripping over the completed ply system through the drain sump. All components of the roof system, including the lead flashing, shall be extended down into the drain bowl. Install clamping ring in bed of sealant and secure to drain bowl compressing all components of the roofing system.

5. Test all drains for proper flow and water tightness. Correct defects.

J. Pipe/conduits sitting on roofs shall be set on and clamped to new rubber blocks with steel channels.

1. Support lines every 10 feet on pipe runs along with support on each side of every union, junction, and direction change.

3.10 SURFACING AND COATING INSTALLATION

A. Allow roof system to cure 28 days after modified cap sheet installation. Power wash roof system to remove all debris.

B. Prime roof system prior to coating at a coverage rate of 300sq.ft. per gallon. All installed primer must be coated on the same day as application.

1. Apply coating in two coats at 1.5 gallons per 100 sq. ft. per coat over roof system and metal components.

a. Back roll coating to insure an even application over all surfaces.

b. Roofs to be left clean.

C. Gravel Surfacing at identified concrete deck roof section at Bonita High School and at the Transportation Building:

1. Install flood coat of Rock It sufcaing adhesive at a coverage rate of 5 gallons per 100 sq.ft.

2. Immediately broadcast gravel into flood coat at a rate of 200lbs. per 100sq.ft.

3.11 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads from roof access to and around all serviceable equipment.

1. Set pads in a spot application of Polyroof SF.

2. Do not coat walkway pads.

3.12 FIELD QUALITY CONTROL

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

B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.13 PROTECTING AND CLEANING

A. Protect roofing system 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 Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

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

SECTION CONTINUES

3.14 ROOFING INSTALLER'S WARRANTY

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

1. Owner:

2. Address:

3. Building Name/Type:

4. Address:

5. Area of Work:

6. Acceptance Date:

7. Warranty Period:

8. Expiration Date:

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,

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.

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

9. 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 74 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.

10. 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.

11. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.

12. 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.

13. 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.

14. 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.

15. 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.

IN WITNESS THEREOF, this instrument has been duly executed by:

16. Authorized Signature:

17. Name:

18. Date:

END OF SECTION 07 52 16.13