

PERRIS UNION HIGH SCHOOL DISTRICT: THE ACADEMY – PATIO ROOF SECTION
SECTION 07 52 16 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Provide all labor, equipment, and miscellaneous material to install District furnished and CMAS purchased torch applied roofing system over the properly prepared substrate for Perris Union High School District. The installer shall be financially responsible for the materials that are not supplied by the District and The Garland Company, and all labor to install the specified roofing system.
- B. The Owner will provide roofing materials specifically listed at the end of the specification section in the quantities listed only. Roofing contractor is required to purchase any necessary additional materials at roofing contractor's cost and should be included in bid price. Contractor responsible to coordinate ordering materials, receive and unload all materials at site, safely stage and load all materials to roof.

1.02 SUMMARY

- A. Scope or Work: The Academy (Back Patio Roof Section Only)
 - 1. District will remove and replace HVAC equipment off and on the roof. District to secure HVAC equipment while off the roof.
 - 2. Roofing contractor to tear off existing roof system and dispose of properly. Remove bottom 2-3 rows of shingles and replace after new torch roof system is installed.
 - 3. Remove and replace the curbs as discussed at the Job Walk. Roof up and over curbs and install new metal covers for each unit. Three course all corners with KEE Mastic and mesh.
 - 4. Replace 100 square feet of damaged or failed substrate with same like and kind. Provide District with square foot replacement cost above the 100 square foot amount.
 - 5. Fasten new ¼" primed densdeck per ASCE 7-05.
 - 6. Torch apply SBS-modified torch base sheet, 120 mil – HPR Torch Base Sheet.

7. Torch apply SBS-modified torch cap sheet, 195 mil – Stressply IV Plus Mineral.
8. Torch apply an extra ply of SBS-modified flashing ply in all flashing areas 190 mil -- HPR Torch Sheet.
9. Install new Dura Blocks for all conduit lines set on walk pads.

1.03 REFERENCES

A. American Society of Civil Engineers (ASCE):

1. ASCE 7-05, Minimum Design Loads for Buildings and Other Structures.

B. American Society for Testing and Materials (ASTM):

1. ASTM 0451 Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
2. ASTM D 1079 Standard Terminology Relating, to Roofing, Waterproofing and Bituminous Materials.
3. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
4. ASTM D1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
5. ASTM D4586 Standard Specification for Asphalt Roof Cement.
6. ASTM D2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.
7. ASTM D5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
8. ASTM D6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
9. ASTM D6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
10. ASTM E108 Standard Test Methods for Fire Test of Roof Coverings.

C. Factory Mutual Research (FM):

1. Roof Assembly Classifications.

- D. National Roofing Contractors Association (NRCA):
 - a. Roofing and Waterproofing Manual.
- E. Underwriters Laboratories, Inc. (UL):
 - a. Fire Hazard Classifications.
- F. Warnock Hersey (WH):
 - b. Fire Hazard Classifications.

1.04 SUBMITTALS

- A. Submit certification that the roof system furnished is approved by Factory Mutual, Underwriters Laboratories. or Warnock Hersey for external fire E-108 Class IA and that the roof system is adhered properly per ASCE 7-05.
- B. Product Data for each type of product specified including manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required. Include data substantiating that materials comply with minimum specified requirements. Materials submitted must meet minimum requirements stated in this specification for thickness and strength (tensile and tear).
- C. Show evidence that the Installer specializes in modified bituminous roof application with a minimum 5 years' experience and who is certified by the roofing system manufacturer as qualified to install manufacturer's roofing materials. Show evidence that roofing manufacturer has 5 years experience performing daily site inspections and daily inspection reports with a full time employee of that manufacturer. Contact information will be required for verification.
- D. Provide a sample of each product. Provide a wet sample of the polyurea.
- E. Unexecuted Manufacturer's 30 NDL warranty covering both LABOR AND MATERIALS. This must be from the same manufacture of the metal roof system and can not be pro-rated.
- F. Certified copy of ISO 9001 compliance.
- G. Roof Contractor to provide all submittals.

1.05 QUALITY ASSURANCE REQUIREMENTS

- A. Manufacturer Qualifications: Roofing system manufacturer shall have a minimum of 30 years' experience in manufacturing bitumen roofing products in the United States and be ISO 9001 certified.
- B. Installer Qualifications: Installer (Roofer) shall be specializing in modified bituminous roof application with minimum 10 years' experience and who is certified by the roofing system manufacturer as qualified to install manufacturer's roofing materials.
- C. Installer's Field Supervision: Require Installer to maintain a full-time Supervisor/Foreman on job site during all phases of bituminous sheet roofing work and at any time roofing work is in progress, proper supervision of workmen shall be maintained. In addition, a minimum of a two-hour fire watch is required on each day that torch applied membranes are installed. Crews must stay on site for 2 hours after last torch applied sheet is installed and at the end of the 2 hour wait the crew should use a heat sensor to check walls and cant strip. A copy of the specification shall be in the possession of the Supervisor/Foremen and on the roof at all times.
- D. It shall be the roofing Contractor's responsibility to respond immediately to correction of roof leakage during construction. If the Roofing Contractor does not respond within 24 hours, the district has the right to hire a qualified Roof Contractor and back charge the original General Contractor / Roofing Contractor.
- E. Source Limitations: Obtain all components of roof system from a single manufacturer, which include the specified roofing membranes, coatings and metal standing seam panels and coping materials in other sections 07 41 00.
- F. Pre-application Roofing Conference: Before scheduled commencement of modified bitumen roof system installation and associated work, a meeting shall be held at project site with installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in the around roofing must precede or follow roofing work (including mechanical work if any), DISTRICT, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) District's insurers, test agencies and governing authorities.
 - 1. Objectives to include:
 - a. Review foreseeable methods and procedures related to roofing work.

- b. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by other trades.
- c. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
- d. Review roofing system requirements (drawings, specifications and other contract documents).
- e. Review required submittals both completed and yet to be completed.
- f. Review and finalize construction schedule related to roofing work and verify availability of material, Installer's personnel, equipment and facilities needed to make progress and avoid delays.
- g. Review required inspection, testing, certifications, and material usage accounting procedures.
- h. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).
- i. Record (contractor) discussion of conference including decisions and agreements (or disagreements) reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
- j. Review notification procedures for weather or non-working days.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged. Any damaged material to be noted at delivery and returned at no cost to the District.
- B. Roof Contractor responsible for materials upon delivery. Any lost or stolen material must be replenished by the General Contractor / Roof Contractor. District is absolved of any liability in regards to material delivery or material storage.

- C. Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).
- D. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- E. It is the responsibility of the Roofing Contractor to secure all material and equipment on the job site. If any materials or equipment is stored on the roof, the Roofing Contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the Roofing Contractor will be the sole responsibility of the Roof Contractor and will be repaired or replaced at his expense.

1.07 MANUFACTURING DUTIES FOR DISTRICT

- A. When the project is in progress, the Manufacturer will provide the following:
 - 1. Keep District informed as to the progress and quality or the work as observed.
 - 2. Job site inspections a minimum of three days a week. Daily inspection reports sent to the District representatives and contractor each day.
 - 3. Report in writing any failure or refusal of the Roofing Contractor to correct unacceptable practices called to the Contractor's attention.
 - 4. Confirm after completion of the project that no application procedures are in conflict with the specifications other than those that may have been previously reported and corrected.
- B. Upon completion of the project, the Manufacturer will provide the following:
 - 1. Provide 30 year warranty to District at no charge.
 - 2. Provide a minimum of one inspection annually of the roof. Notify the District prior to any inspections. Provide a written report of findings and schedule of maintenance and or repairs, if any should be necessary, within 10 days of inspection.

1.08 PROJECT CONDITIONS

- A. Weather Condition Limitations: Do not apply roofing membrane during inclement weather or when a 40% 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.

1.09 SEQUENCING AND SCHEDULING

- A. 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 sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.
- B. All work must be fully completed on each day. Phased construction will not be accepted.

1.10 WARRANTY

- A. Membrane Manufacturer upon completion of installation, and acceptance by the Owner, will supply to the Owner a thirty (30) year warranty on all new roof sections. There can be no charge to the District for this warranty. This must be a No Dollar Limit, watertight, non pro-rated, and cover both labor and materials.
- B. Roofing Contractor will submit a minimum of a two year bonded warranty and 3 year contractor warranty for a total of a five year warranty to the membrane manufacturer with a copy directly to District.
- C. Single source warranty from the manufacturer covering all membranes and coatings.

PART 2 – PRODUCTS

2.01 GENERAL

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

The Garland Company

3800 E 91st Street
Cleveland, Ohio 44104
Jason Busanovitch 951-300-8377

- B. All Garland materials in excess of district purchased and furnished amount on back of this section, shall be provide by contractor. Contractor responsible for freight and loading/unloading of all additional materials. Contractor responsible for all materials not supplied by the District but required to complete this project.

2.02 DESCRIPTION

A. Modified bituminous roofing work including but not limited to

a. System:

- i. Torch Grade Base Sheet – HPR Torch Base Sheet-"Supplied by District" fully adhered to approved torchable substrate with roofer's torches.
- ii. All flashings will include one ply of SBS Torch Grade Base sheet – HPR Torch Base Sheet-"Supplied by District" and one ply of SBS Torch Modified Membrane -- Stressply IV Plus Mineral- "Supplied by District
- iii. The modified membrane and materials will be: Stressply IV Plus Mineral "Supplied by District".
- iv. Garla Flex Mastic, Supplied by district.

2.3 SHEET MATERIALS - PERFORMANCE CHARACTERISTICS

A. STRESSPLY IV PLUS MINERAL - "Supplied by District"

ASTM D 6163 Type III Grade G

Tensile Strength (ASTM D-5147)

2 in/min.@ 73.41+/- 3.6°F MD 300 lbf/in CMD 300 lbf/in

Tensile Strength (ASTM D-5147)

2 in/min.@ 73.41+/- 3.6°F MD500lbf CMD 500 lbf

Elongation at Maximum Tensile (ASTM D-5147)

2 in/min.@ 73.4+/- 3.6°F

MD 5.0% CMD 5.0%

Low Temperature Flexibility (ASTM D-5147) Passes -10°F (-23°C)

B. HPR Torch Base Sheet -- "Supplied by District"

Tensile Strength (ASTM D-5147)

2 in/min.@ 73.4+/- 3.6°F

MD 200 lbf/in

Tensile Strength (ASTM D-5147)

2 in/min.@ 73.4+/- 3.6°F

MD 230 lbf

Elongation at Maximum Tensile (ASTM D-5147)

2 in/min.@ 73.4+/- 3.6°F

MD 4.0%

2.04 SURFACINGS

A. Roof/Coating: - N/A

2.05 RELATED MATERIALS

- A. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the deck material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.
- B. Walkway Pads: As recommended by the membrane manufacturer set in approved adhesive to control foot traffic on rooftop surface and give a durable system compliant non-slip walkway.
- C. Walkway Pad Adhesive: Adhesive used to adhere approved walk way pads as recommended by the membrane manufacturer.
- D. Coping Cap Sheet Metal: 22 gauge, galvanized, Kynar coated coping cap sheet metal. Must be manufactured and warranted by membrane manufacturer.

- E. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

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. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Roof System Manufacturer and Installer.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
- B. Insurance/Code Compliance: Where required, install and test the 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. Replace or restore other work damaged by installations of the 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. Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation with two (2) plies of #15 organic roofing felt with joints and edges sealed with roofing cement and other jointly agreed upon tie-in detail. Remove cut-offs immediately before resuming work.
- E. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building, or damaging roofing system components 01' adjacent building construction.
- F. Apply roofing materials as specified herein unless recommended otherwise by manufacturer's instructions. Keep roofing materials dry before and during application. Do not permit phased construction. Complete application of roofing plies, modified sheet and flashing in a

continuous operation. Begin and apply only as much roofing in one day as can be completed that same day.

- G. Cut-Offs: At end of each day's roofing installation, protect exposed edge of incomplete work, including ply sheets and insulation. Provide temporary covering of two (2) plies of #15 organic roofing felt set in full moppings of bitumen with joints and edges sealed or other jointly agreed upon tic-in detail.
- H. A minimum two-hour fire watch is required for each day that torch-applied membranes are installed.
- I. Keep an ABC rated fire extinguisher in a central location where all workers know, where it is and how to operate in properly.

3.03 MEMBRANE INSTALLATION

A. Torch System:

- a. Install one layer of SBS Torch Base Sheet to a properly prepared substrate. Shingle in proper direction to shed water on each area of roofing.
- b. 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.
- c. After the major portion of the roll is bonded, re-roll the first six feet and bond it in a similar fashion.
- d. Repeat this operation with subsequent rolls with side laps or four inches and end laps of eight inches.
- e. 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.
- f. Extend underlayment two inches beyond top edges of cants at wall and projection bases.
- g. Install base flashing ply to all perimeter and projections details.

3.04 FLASHING MEMBRANE INSTALLATION (GENERAL)

A. Torch System:

- a. All curb, wall and parapet flashings shall be sealed on a daily basis. No condition should exist that will permit moisture entering behind, around or under the roof or flashing membrane.
- b. Prepare all walls, penetrations and expansion joints to be flashed with asphalt primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
- c. All flashing plies will be adhered with a roofer's torch. The modified membrane will be used as the flashing and will be nailed off 8" o.c. at all vertical surfaces.
- d. The entire sheet of flashing membrane must be solidly adhered to the substrate.
- e. Seal all vertical laps of flashing membrane with a three-course application of Flashing Bond and fiberglass mesh.
- f. Counter flashing, cap flashings, expansion joints, and similar work to be coordinated with modified bitumen roofing work are specified in other sections.
- g. Roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with the roofing system work are in other sections.

3.05 APPLICATION OF SURFACING

- A. Prior to installation of coating and gravel, obtain approval from manufacturer as to work completed that it is ready to be coated. Roof mastic must cure for 30 days before application of coating.
- B. Reflective Coating:
 - a. N/A

3.06 – FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Installer, installer of associated work, District, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.
- B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party attending.
- C. The Roofing System Manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if

any damp or wet materials have been installed. The thermographic scan shall be provided by the Roof Contractor at a negotiated price.

- D. If core cuts verify the presence of damp or wet materials, the Roof Contractor shall be required to replace the damaged areas at his own expense.
- E. Repair or replace (as required) deteriorated or defective work found at time of any inspection during the project to a condition free of damage and deterioration and according to warranty requirements.

3.07 OWNER SUPPLIED MATERIALS

A. Contractor must provide all labor to install owner supplied materials as part of their bid. All materials not specifically included in the owner supplied materials section will be the responsibility of the contractor to provide and install in compliance with section 07 52 16. Freight charges of Owner supplied materials will be the responsibility of the Owner. Contractor must take delivery of materials, unload materials upon arrival, properly protect, cover and store at jobsite. Contractor responsible for any equipment required to unload materials from trucks and load onto roof including but not limited to required cranes and safety requirements. Contractor must be able to provide certification in writing from roof system manufacturer that the contractor is approved to install the specified roof system and provide all warranty requirements of section 07 52 16. Any material quantities in addition to the amount of materials listed in 3.08 B that are needed to complete this project or any materials not listed below shall be the responsibility of the Contractor to purchase and supply.

B. Materials specifically provided by the Owner;

- 1. Stressply IV Plus Mineral, $\frac{3}{4}$ square roll, 18 rolls
- 2. HPR Torch Base Sheet, 1 square roll, 23 rolls
- 3. KEE-Lock Mastic, 3.5 gallon pail, 2 pails
- 4. Freight, 1 time freight 1 time

END OF SECTION 07 52 16