

SECTION 075430

ADHERED THERMOPLASTIC (PVC) FELTBACK MEMBRANE ROOFING

PART 1 – GENERAL CONDITIONS

1.1 DESCRIPTION

A. Summary:

Install an adhered thermoplastic (PVC) feltback membrane roof system, including, but not limited to, removal of existing roof system, primed gypsum cover board, PVC membrane flashings, PVC metal edge/fascia flashing, and other components to comprise a weathertight roof system. The roof system shall comply with the herein specified roofing manufacturer's standard written and detail requirements. Note: Sika Sarnafil products and system installation requirements have been utilized as the basis of design for this project.

B. System Description:

1. Remove and dispose of existing roof system; including all vertical roof system flashings and applicable metal down to the lightweight insulating concrete (LWIC) roof deck substrate. All removal, hauling, and disposal procedures must be performed by a certified contractor and must meet or exceed all applicable Local and State requirements. Existing sheet metal parapet wall cap flashing and sheet metal counter-flashing shall be removed with care and reused (reinstalled) upon completion of the PVC membrane flashings.
2. As applicable, asbestos containing materials (ACM) are present in those components and areas of the building subject to the work of this project. The scope of the asbestos removal work shall be as required to comply with Local, State, and Federal regulations and standards. The Applicator shall obtain and pay for all licenses and permits associated with all asbestos work. The Applicator shall provide to the Placentia Library District Representative copies of all permits, certificates, and other related documents pertaining to the asbestos removal work.
3. As identified by the Placentia Library District Representative, remove and dispose of all non-usable roof vents, applicable curbs and abandoned roof penetrations. Repair and/or replace roof deck substrate to match existing in accordance with Local building code requirements. Deck replacement shall match the same size and type as that of existing deck.
4. Carefully remove the first course, and/or ridge cap roof tiles adjacent to and above the low slope roof areas being replaced to allow proper installation of the new membrane roof system flashings. Existing roof tiles are to be re-installed following completion of the new PVC membrane roof system installation. Any broken or missing tiles are to be replaced with new matching tiles. Any new tiles are to be used at concealed areas, not detracting from the appearance of the tile roof system.

5. At all new and existing Equipment Curb and Roof Hatch locations without crickets on the upslope side and with an upslope dimension larger than 35", install tapered isocyanurate roof insulation crickets. The cricket slope shall be two times the primary roof deck slope and adhered in place with low-rise foam insulation adhesive at a rate not less than 12" on-center, 1/4" to 1/2" wide ribbon spacing and in accordance with FM 1-90 uplift resistance requirements.
6. Over the properly prepared LWIC roof deck, install a layer of 1/4" thick gypsum cover board with fiberglass mat facer. The cover board shall be secured to the LWIC substrate using Factory Mutual and manufacturer approved low-rise foam insulation board adhesive at a field attachment rate not less than 12" on-center 1/4" to 1/2" bead ribbon spacing per 4'x8' board. Perimeter and corner attachment rates must be increased in accordance with Factory Mutual Data Sheets 1-28/29 requirements.
7. Install a layer of fiberglass reinforced 72-mil thermoplastic (PVC) feltback membrane (EnergySmart White). The membrane shall be installed directly over the gypsum cover board and shall be adhered using VOC compliant, water-based adhesive. The membrane shall meet or exceed Cool Roof Rating Council (CRRC) requirements for Title 24 compliance.
8. Install new PVC clad metal drip edge flashing around entire perimeter edge of the existing parapet walls and roof edges associated with the new roof system installation. The new drip edge shall have a minimum four inch (4") attachment flange, three and a half inch (3.5") vertical face with additional one-half inch (1/2") hemmed "kick" at bottom edge. The edge metal shall be secured to the existing wood nailer or plywood roof deck and framing using approved galvanized-steel angular ring-shank nails at a spacing of four-inch (4") on-center, staggered. Install a continuous metal cleat (hook strip) and PVC membrane coverstrip in accordance with the Roofing Manufacturer's standard written and detail requirements. Note: Install PVC clad metal covers at all vertical joints in accordance with Roofing Manufacturer's standard requirements.
9. Install adhered, fiberglass reinforced, 60-mil PVC flashing membrane at vertical parapet walls. Adhere new asphalt/oil resistant PVC flashing membrane to prepared vertical wall substrate with V.O.C. compliant, solvent based flashing adhesive. At existing locations with roof system flashings carried up under existing GSM cap flashing, install new membrane flashing carried up and over the top of wall prior to installing the new PVC clad metal edge flashing. All new sheet metal installation shall conform to current SMACNA, membrane manufacturer and local building code requirements. NOTE: At contractor's option, adhered asphalt/oil resistant membrane flashing may be substituted with adhered 9 oz. geotextile fabric polypropylene separator and adhered standard 60-mil fiberglass reinforced flashing membrane at vertical flashing locations in lieu of asphalt/oil resistant PVC flashing membrane.
10. Install manufactured 24 gauge minimum, surface mounted reglet and spring lock skirt flashing above parapet wall membrane flashing at lower roof section. New surface mounted reglet and skirt flashing shall be set in approved sealant and fastened with grommetted fasteners at factory punched slotted holes spaced no greater than 16" on-center. Top of reglet shall be sealed with approved sealant. Skirt flashing shall carry down over top of membrane flashing a minimum of four-inches (4"). All new sheet metal installation shall conform to current SMACNA, membrane manufacturer and local building code requirements.

11. At all exhaust fan/vent curb locations install adhered fiberglass reinforced asphalt/oil resistant PVC membrane flashing. Using 60-mil flashing membrane, perform adhered membrane flashing detail. Apply a continuous bead of approved urethane sealant behind flashing membrane at termination point where mechanical fasteners will penetrate membrane. Fastener spacing for membrane termination shall be eight inches (8") on-center using approved fasteners. Reinstall exhaust fan/vent and secure to curb using increased diameter, metal-capped grommets fasteners at a spacing of eight inches (8") on-center. Where possible, use existing fastener holes when installing new fasteners. Seal exposed fastener holes using approved urethane sealant. Note: Where existing flashing height is below eight-inches (8"), install new, dimensional lumber, #2 & Better grade Douglas Fir curb extensions and secure to existing curb in accordance with local building code seismic requirements. Extend electrical supply (conduit) as required at Power Exhaust Fan units. All electrical work must be performed by a certified/licensed Electrical Contractor only.
12. At exhaust vent penetrations without pre-made curb and counter flashing assembly, install adhered vertical PVC membrane flashing a minimum of eight-inches (8") and terminated top of membrane with manufacturer's 2-1/4" wide extruded aluminum termination bar sealed and fastened at eight-inches on-center (8"o.c.) maximum spacing. Apply approved one-part urethane seal behind top of membrane, behind and at top of termination bar. Directly above the termination bar, install sheet metal surface mounted reglet and spring lock skirt flashing covering top of the membrane flashing assembly a minimum of four-inches (4"). Reference item #10 above for surface mounted reglet and spring lock skirt flashing installation.
13. All new HVAC equipment curbs shall receive adhered 60 mil fiberglass reinforced flashing membrane. Using 60-mil PVC flashing membrane, install adhered flashing detail and terminate at top edge of membrane using 22 Ga. GSM extender piece. The extender piece shall be installed behind the inside face of curb flange (at optimum height allowed) and shall be secured to the curb using approved metal-capped grommets fasteners at 12" on-center spacing. Apply a continuous bead of approved urethane sealant behind galvanized sheet metal skirt flashing where mechanical fasteners will penetrate membrane.
14. Install 60-mil asphalt-oil resistant PVC flashing membrane at existing roof hatch curb. The flashing membrane shall be adhered to the properly prepared vertical substrate using V.O.C. compliant adhesive. Membrane termination shall be performed using Roofing Manufacturer approved termination reglet with one-part urethane sealant.
15. All open (soil, vent, etc.) pipes shall be flashed utilizing "Vent Stack" detail with PVC membrane cap. Note: The use of clamps for membrane termination will not be accepted at open (non-connected) pipes.
16. All connected (conduit, gas, etc.) pipes shall be flashed utilizing PVC flashing membrane with 60 mil fiberglass reinforced PVC membrane with sealant and stainless steel draw band at top of flashing along with secondary membrane storm collar, sealant and stainless steel draw band.
17. All "Hot-Pipe" penetrations shall be flashed in accordance with the Roofing Manufacturer's temperature separation requirements. An acceptable metal sleeve, insulation, and rain collar are required to separate PVC flashing membrane from hot pipe, minimum two inch (2") separation. Use high temperature sealant at rain collar and hot pipe location.

18. Replace all existing roof drain clamping rings, bolts and debris strainers with new matching components. Existing drain bowls shall be thoroughly cleaned and free from asphalt or other non-compatible material. All primary and overflow roof drains to receive new asphalt/oil resistant flashing membrane target with one full tube of manufacturer approved urethane sealant between the new flashing membrane and drain bowl receiver flange. Flashing membrane target shall be hot air welded to roof membrane and installed in accordance with manufacturer's "Clamping Ring Drain" flashing detail requirements.
19. At all inside and outside corner locations, install prefabricated membrane flashings only.
20. At all rooftop electrical conduit, condensate piping, gas piping, etc., install new, prefabricated thermoplastic pipe supports as manufactured by Erico-Caddy, or pre-approved equal. The pipe supports shall be positioned at a maximum spacing as required allowing for continuous four inch (4") clearance above the finished roof surface. Properly secure the conduit/piping to the pipe support using approved metal straps.
21. Install 96-mil PVC walkway tread (Light Grey color) at the three open sides of the roof hatch and at the two serviceable sides of the new and regularly maintained HVAC equipment. The walkway tread shall be installed in accordance with the Roofing Manufacturer's standard written and detail requirements.
22. Perform all roofing work in strict accordance with the herein specified, and/or otherwise indicated Placentia Library District standards for detail and flashing applications. These standards shall supersede Roofing Manufacturer's minimum/standard requirements.

A. Work Included:

The work includes but is not necessarily limited to the installation of:

1. Removal of Existing Roofing.
2. Substrate Preparation.
3. Tapered Isocyanurate Roof Insulation Crickets.
4. Fiberglass Matt Faced Gypsum Cover Board.
5. Flashing Membrane Adhesive.
6. Roof Membrane Adhesive
7. Attachment Plates & Fasteners.
8. Thermoplastic (PVC) Roof Membrane.
9. Thermoplastic (PVC) Flashing Membrane.
10. Metal Flashings.
11. Sealants.
12. Roof Drains.
13. Equipment Access/Walkway Tread.
14. Prefabricated Pipe Supports (Erico-Caddy).

1.2 QUALITY ASSURANCE

- A. Pre-Bidding Report: To find and resolve conflicts or lack of definition that may create construction problems, each Bidder for the Work of Section 07543 shall submit in writing any conflicts with the specification and required work to Placentia Library District Representative at least 14 days before Bids are due for the Work of this Section.
- B. Pre-Roofing Conference and Inspection: After approval of submittals but prior to beginning installation of Work of this Section, the Owner's Representative shall hold a meeting at the site attended by the Placentia Library District Representative, Roofing Applicator, Sheet Metal, Mechanical, and Electrical Subcontractors, and the Roofing Material Manufacturer to describe in detail the roof system(s) to be installed and to establish agreement, coordination, and responsibilities among the involved trades.
- C. The roofing system shall be applied only by an Applicator authorized by the specified Roofing Manufacturer prior to bid. The Applicator shall have a minimum of five (5) years documented experience with the Roofing Manufacturer. The Owner's Representative reserves the right to request a list of reference projects to verify Applicator's performance/work history. All references must be of similar size and scope, and must be within 100 miles of this project.
- D. The Roofing Manufacturer shall have directly produced the roof membrane for the number of years equal to, or greater than that of the warranty term (20 years). The membrane shall have also maintained a consistent base formulation for the same number of years.
- E. The Roofing Manufacturer shall have a *Sustainable Product Certification* conforming to the requirements of *NSF/ANSI 347 – Sustainability Assessment for Single Ply Roofing Membranes*. Minimum certification level established for this project is: *Platinum*.
- F. Use only a Manufacturer who has initiated a post consumer recycling program and can demonstrate a minimum of five projects where the existing PVC membrane has been removed and recycled into new roofing membrane or PVC components.
- G. Membrane Manufacturer must have *Recycled Content Certification* from UL (Underwriters Laboratories) Environment.
- H. Membrane thickness stated in this document refers to waterproofing membrane PVC polymer thickness. Polyester felt backing is always in addition to the required membrane thickness and is measured in weight per square yard. The required weight for felt backing is nine ounces per square yard (9-Oz./Yd²). This is a non-negotiable minimum requirement.
- I. Unreinforced or polyester reinforced membranes are prohibited.
- J. Re-labeled / re-packaged ("Private-labeled") primary and flashing membranes will not be accepted.
- K. Membrane Manufacturer must have ISO 14001 Certification and a Responsible Care Program in-place with current good standing status.

- L. Membrane Manufacturer must not require the use of membrane cut edge sealant at any location. This is a maintenance item that the Owner does not accept.
- M. The Manufacturer shall provide interim and final roof inspection from a directly employed dedicated team of experienced inspectors. Sales personnel may not be used for onsite inspection of installations.

1.3 PRE-INSTALLATION MEETING

- A. Arrange for a Pre-Installation Meeting between the Applicator, City of San Bernardino Representative, Roofing Manufacturer's Representative, and related trades to be held at least two (2) weeks prior to the beginning of roof system installation.
- B. Review contract documents, manufacturer's instructions, project conditions, and proposed methods and procedures related to installation.
 - 1. Identify conditions that would be detrimental to proper installation.
 - 2. Review special details, corner conditions, drainage patterns, penetrations and similar conditions of adjacent construction that will affect or impact surface preparation and installation operations.
 - 3. Review substrates and surfaces to receive materials in order to verify compliance with specified requirements, and with manufacturer's substrate tolerance recommendations and surface preparation requirements, including flatness, levelness, damage and imperfections, and quality of attachment to structure.
 - 4. Review limitations of floor and roof decks for structural loading both during and after installation.
- C. Review governing regulations and specified requirements for certificates, inspection, reports and closeout submittals.
- D. Review sequence of installation, finalize construction schedule, and verify availability of materials, installer's personnel, equipment and facilities necessary to make progress and avoid delays.
- E. Review temporary protection procedures required to be followed to provide protection of stored and installed products and accessories both during and after installation.
- F. Owner's Representative shall record significant meeting discussions, agreements and disagreements, including required corrective measures and actions to be taken before work begins. Distribute copy of minutes to Owner's Authorized Representative, to each party present, and to parties who should have been present no later than 3 business days following the meeting.
- G. Do not proceed with installation until all attendees, including all parties who should have been present, provide written acknowledgement of receipt and agreement to the conditions and requirements as described in the "Meeting Minutes". If disagreements cannot be successfully resolved, initiate necessary actions to remove impediments to execution of the Work and reconvene meeting at earliest available date to resolve outstanding disagreements.

1.4 PERFORMANCE REQUIREMENTS

General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

- C. The applicator shall submit evidence that the proposed roof system meets local building code requirements and has been tested and approved or listed by the following test organizations.

1. Factory Mutual Research Corporation: FM 1-90
2. Underwriters Laboratories, Inc.: Class A assembly

- D. Energy Performance:

Low-Slope Roofs: Provide roof system with an initial Solar Reflectance Index (SRI) of not less than 100 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency. Roof membrane (not post installation applied finish) shall comply with current California Title 24 Part 6 minimum 3-year aged solar reflectance of 0.63 and a minimum thermal emittance of 0.75 requirements.

1.5 SUBMITTALS:

- A. Submittals (utilizing the base specified system: Sika Sarnafil)

1. A list of each primary component to be used in the roof system and the Manufacturer's current literature for each component.
2. Sample copy of Roofing Manufacturer's warranty.
3. Sample copy of Contractor's warranty.
4. Letter from Roofing Manufacturer confirming that the Contractor is an authorized applicator of the specified roof system.
5. Confirmation of Performance Requirements including wind uplift resistance, fire rating and "Cool Roof" certification.

- B. Submittals of equals

Submit proposed equals to be considered for use on this project no less than fifteen (15) days prior to bid date. Proposed roof systems which have been reviewed and accepted will be listed in an addendum prior to bid date; only then will roof systems be accepted at bidding. All below referenced letters must be original, wet-ink signed by the proposed Roofing Manufacturer's Technical Director/Manager. Submittals shall include the following:

1. Two 12 inch x 12 inch membrane samples and two samples of each component to be used in the roofing system.
2. Manufacturer's specification matching the herein specified requirements for all sub-sections as listed, including applicable detail drawings and descriptive list of materials to be used.

3. Letter from the proposed Roofing Manufacturer stating that the Manufacturer has a minimum of 20 years consistent experience in directly producing the proposed roof system. The letter shall also state that the proposed Manufacturer's membrane has maintained a consistent formulation for a minimum of 20 years.
4. Letter from the Cool Roof Rating Council (CRRC) stating that the proposed PVC membrane demonstrates the required Solar Reflectance Index requirements as stated in Section 1.4 D above. Submit listing as an approved product by the CRRC.
5. Letter from proposed Roofing Manufacturer describing the specified certified polymer thickness program. Included shall be a sample copy of the proposed Manufacturer's certificate for polymer thickness as specified.
6. Letter from the proposed Roofing Manufacturer confirming that it has been engaged in a post-consumer recycling program in compliance with the requirements as started in Section 1.2 F above. The proposed Roofing Manufacturer shall provide written proof that its post-consumer recycling program has achieved *UL Environmental* certification.
7. Complete list of material physical and mechanical properties for each membrane and component including; weights and thicknesses; ultimate elongation; puncture resistance; seam peel strength; breaking strength; tear strength; dimensional stability; low temperature bend; and post-consumer recycle content.
8. Sample copy of specified warranties.
 - a. Manufacturer's 20-Year System Warranty (with no ponding/standing water exclusions).
 - b. Contractor's Two (2) Year Warranty
9. Letter from the proposed Roofing Manufacturer confirming that the Contractor is an authorized applicator of the proposed roof system per the requirements of Section 1.2 C listed above.

1.6 PRODUCT DELIVERY, STORAGE, and HANDLING:

All products delivered to the job-site shall be in the original unopened containers or wrappings bearing all seals and approvals. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

1.7 JOB CONDITIONS

- A. PVC materials may be installed under certain adverse weather conditions but only after consultation with the Roofing Manufacturer, as installation time and system integrity may be affected.
- B. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work.
- C. The Applicator shall conduct adhesion tests in accordance with the latest revision of the ANSI/SPRI Adhesion Test Standard to verify condition of deck and to confirm expected adhesion values. Adhesion tests shall be performed a minimum of one (1) week prior to job start.

- D. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of 1/2" plywood over polyester felt or 1/2" plywood over insulation board shall be provided for all new and existing roof areas which receive rooftop traffic during construction.
- E. The Applicator shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Applicator shall report any such blockages to the Owner's Representative for corrective action prior to beginning roof system installation.

1.8 BIDDING REQUIREMENTS

A. Bidders Responsibility

Bidders must have held their Roofing Contractors License (C39) for a minimum of five (5) years, with a continuous "Good-Standing" status to qualify to bid on this project. Any discrepancy between measurements and conditions listed within this specification, roof plans, and details, and those actually incurred on the job will be the responsibility of the Applicator.

1.9 WARRANTIES

A. Roofing Manufacturer's 20 Year Full System Warranty: 60 MPH Windspeed Coverage

Upon successful completion of all the work to the Roofing Manufacturer's and Owner's Representative's satisfaction, the 20 Year Full System warranty shall be issued. The System warranty shall provide Non-Penal Sum (replacement cost) coverage for the roof membrane, all associated accessories that comprise the roof system, and all contractor labor. The warranty shall be non-prorated, and shall not exclude ponding/standing water and no time limit shall be assigned for any such ponding/standing water during the warranty term. The warranty shall not exclude regular foot traffic or storage of equipment, materials, tools, etc. of any kind upon the roof membrane surface. Warranty shall not obligate the Owner to perform manufacturer defined maintenance work as a condition of continued warranty coverage.

B. Roofing Applicator/Contractor Two (2) Year Warranty

The Applicator/Contractor shall supply the Owner with a separate two year workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Applicator/Contractor warranty term, defective or otherwise not in accordance with the Contract Documents, the Applicator/Contractor shall repair that defect at no cost to the Owner.

- C. "Early Bird" warranties are not to be issued as they will not be accepted by the Owner. The above specified Warranty will be issued only upon acceptance by the Roofing Manufacturer's Technical Department and the Owner's Representative's final approval.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The components of the adhered PVC feltback membrane roof system basis of design are products of Sika Sarnafil and/or products utilized by Sika Sarnafil to designate type, quality, and performance standards for this project.
- B. Substitutions: Upon pre-approval in accordance with Section 1.5 B above.

2.2 MANUFACTURER AND MEMBRANE

- A. Sika Sarnafil: Western Region Contact: (909) 942-0079
- B. G410-72 mil minimum: Fiberglass reinforced membrane with an integral lacquer coating to repel dirt and sustain long-term solar reflectivity.
- C. Membrane shall be manufactured by Extrusion/Spread Coating process only, producing a monolithic membrane with fully encapsulated fiberglass reinforcement layer and a minimum of 35-mils of "weathering" polymer above the fiberglass reinforcement layer.
- D. Membrane shall conform to ASTM D4434 (latest revision), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II Grade I (fiberglass reinforcement).
- E. Roofing Manufacturer shall certify in writing that the product supplied for this project has a minimum polymer thickness of 72 mils. ASTM +/- tolerance for membrane thickness is not accepted.
- F. Membrane shall comply with California Building Code (CBC) Title 24, Section 118 requirements for solar reflectivity and emissivity. Manufacturer and membrane shall be listed in the Cool Roof Rating Council (CRRC) product listing as outlined by the Department of Energy (DOE) and the Environmental Protection Agency (EPA).
- G. As manufactured, membrane shall conform to the following physical properties:
 - 1. Color to be "EnergySmart" White.
 - 2. Thickness to be 72 mil (1.80mm).

Property	<u>TYPICAL PHYSICAL PROPERTIES*</u>		
	ASTM Test Method	ASTM Type II D-4434 Spec. Requirement	Typical Results
Overall Thickness, mil	D751	45	72
Thickness Over Scrim, mil	--	16	35
Reinforcing Material	--	--	Fiberglass
Felt Weight, oz/yd ² (feltback membrane only)	--	--	9
Breaking Strength, lbf/in (N)	D751	55 (245)	100 (445)
Elongation at Break, %	D751	250 & 220	250 & 220

C. Miscellaneous Flashing;

1. Aluminum Membrane Attachment Bar (Sarnastop)
2. Termination Reglet (Sarnareglet)
3. Pipe Boots (Sarnastack)
4. Universal Corners (Sarnacorners)
5. Flashing Membrane Adhesive (Stabond)

2.4 COVER BOARD / ISOCYANURATE INSULATION

A. Georgia-Pacific DensDeck® Cover Board: Impact and mold resistant, gypsum core fire barrier board with pre-coated glass-mat facers. Manufactured to meet the following requirements:

1. ASTM C 1177 (Consensus Standard).
2. Smoke Developed (ASTM E-84): 0 (Zero).
3. Flame Spread (ASTM E-84): 0 (Zero).
4. Mold Resistance (ASTM D3273): 10 (highest level of performance for mold resistance).
5. Compressive Strength (ASTM C 473): 900 psi, nominal.
6. Weight (nominal): 1.2 Lbs./Ft².
7. Board Size: 1/4" X 4' X 8'.

B. Tapered Insulation (Crickets Only): 1/2" min. x 4' x 4' sloped rigid roof insulation panels composed of polyisocyanurate closed-cell foam core with black mat facer laminated to both sides. Manufactured to meet the following requirements:

1. ASTM C1289-11, Type II, Class 1, Grade 2 (20 psi)
2. Zero Ozone Depletion Potential (ODP) from blowing agent (HCFC-free).
3. Long-Term Thermal Resistance (LTTR) R-Value based on ASTM 1303-11 and/or CAN/ULC-S770-09: Regardless of published values.
4. Facer Type: Black mat, fiber reinforced.
5. Board Size: 1/2" min. x 4' x 4'.
6. Tapered Insulation Slope: 1/2" per foot (double the primary slope) or as indicated otherwise.

2.5 ATTACHMENT COMPONENTS

A. Membrane Adhesive: V.O.C. Compliant Water Based Adhesive (Sarnacol 2121 Adhesive): Water-based adhesive used to attach the membrane to the horizontal or near-horizontal substrate. Consult Product Data Sheets for additional information.

B. Cover Board / Insulation Adhesive (Sarnacol 2163 Adhesive): A low odor, VOC compliant, one step, low-rise urethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a gravity fed applicator or by hand with a dual component caulk gun. Consult Product Data Sheets for additional information.

C. Flashing Membrane Adhesive (Stabond Adhesive): Solvent-based reactivating-type adhesive used to attach the membrane to the flashing substrate. Consult Product Data Sheets for additional information.

D. Sarnafastener-XP: Corrosion-resistant #15 fastener used with attachment bar to attach roof membrane at base of vertical flashings to approved substrate.

E. Membrane Attachment Bar (Sarnastop): One (1) inch wide, pre-punched aluminum membrane attachment bar. Used to attach PVC membrane at all perimeter and base-angle transitions. Consult Sarnafil Product Data Sheet for additional information.

2.6 WALKWAY PROTECTION

A. Equipment Access/Walkway Tread (Sarnatred): Polyester reinforced, 96 mil/2.4 mm), weldable membrane with surface embossment. Used as a protection layer from rooftop traffic. Sarnatred is supplied in rolls of 39.3 inches wide and 50.0 feet long. Consult Sarnafil Product Data Sheet for additional information.

2.7 MISCELLANEOUS ACCESSORIES

A. Multi-Purpose Sealing Tape: Compressible foam with pressure-sensitive adhesive on one side. Used with metal flashings as a preventive measure against air and windblown moisture entry.

B. Sarnasolv: Solvent cleaner used for the general cleaning of scuff marks, etc., from the Membrane surface.

2.8 SEALANTS

A. Depending on substrates, the following sealants are options for temporary overnight tie-ins:

1. Multiple layers of roofing cement and felt.
2. Mechanical attachment with rigid bars and compressed sealant.

2.9 MISCELLANEOUS FASTENERS AND ANCHORS:

A. All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel.

PART 3 - EXECUTION

3.1 EXAMINATION:

Report to Owner in writing, all conditions that interfere with or prevent correct installation of work of this Section.

3.2 PRE-INSTALLATION MEETING

- A. Refer to Section 1.3 of this specification for meeting agenda requirements.

Discuss the following additional project aspects:

1. Safety
2. Set up
3. Construction schedule
4. Contract conditions
5. Coordination of the work
6. Building access and material staging
7. Structural Loading Limitations/Requirements
8. Review of Deck and/or Substrate Conditions

3.3 SUBSTRATE CONDITION

- A. Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.
- B. Applicator shall verify that the work done under related sections meets the following conditions:
 1. Roof drains and/or scuppers have been installed properly.
 2. Roof curbs, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
 3. All surfaces are smooth and free of dirt, debris and incompatible materials.
 4. All roof surfaces shall be free of water.

3.4 SUBSTRATE PREPARATION

The roof deck and existing roof construction must be structurally sound to provide support for the new roof system. The Applicator shall load materials on the rooftop in such a manner to eliminate risk of deck overload due to concentrated weight. The Placentia Library District Representative shall ensure that the roof deck is secured to the structural framing according to local building code and in such a manner as to resist all anticipated wind loads in that location.

3.5 SUBSTRATE INSPECTION

- A. A dry, clean and smooth substrate shall be prepared to receive the new PVC feltback membrane roof system.
- B. 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.
- C. 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.
- D. All roof surfaces shall be free of water.

- E. PVC membrane shall be applied over compatible and accepted substrates only.

3.6 COVER BOARD / INSULATION INSTALLATION

- A. Tapered insulation and cover board shall be adhered to the LWIC deck substrate with approved low-rise foam board adhesive at a rate according to Factory Mutual Class 1-90 and the Roofing Manufacturer's requirements for fastening rates and patterns.

3.7 INSTALLATION OF PVC FELTBACK ROOF MEMBRANE:

A. General

1. Roof membrane is to be adhered according to the Roofing Manufacturer and Factory Mutual's requirements.
2. Membrane overlaps shall be shingled with the flow of water where possible.
3. Tack welding of membrane full or half-width rolls for purposes of temporary restraint during installation on windy days is not permitted. Consult Roofing Manufacturer's Technical Department for further information.
4. Hot-air weld overlaps according to roofing manufacturer's Take test cuts at least 3 times per day.
5. Membrane flashings shall extend 2-1/2 inches past the membrane attachment bar and shall be hot-air welded to the field membrane as required.

3.8 HOT-AIR WELDING OF SEAM OVERLAPS :

- A. All field seams shall be hot-air welded using robotic welding equipment only (no hand-held welders). Seam overlaps should be 3 inches wide except for certain details.

3.9 MEMBRANE FLASHINGS:

- A. All flashings shall be installed concurrently with the roof membrane as the job progresses.
- B. Stabond Adhesive for Membrane Flashings: Stabond adhesive shall be applied according to instruction found on the Product Data Sheets. The bonded sheet shall be pressed firmly in place with a hand roller.
- C. All flashings shall extend a minimum of eight (8) inches above roofing level unless otherwise accepted in writing. No bitumen shall be in contact with standard PVC flashing membrane. When asphalt contamination is present, use only asphalt/oil resistant flashing membrane. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Sarnastop at six inches (6") on-center.

3.10 PVC CLAD METAL DRIP FLASHINGS:

- A. All metal flashings shall be fastened into metal stud or wood nailers. Fasteners shall penetrate the nailer a minimum of 1 inch. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

- B. Adjacent sheets of PVC clad metal shall be spaced 1/4 inch apart. The joint shall be covered with two (2) inch wide aluminum tape. A four (4) inch minimum wide strip of PVC flashing membrane shall be hot-air welded over the joint.

3.11 METAL FLASHINGS

- A. Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:
 - 1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
 - 2. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) – latest issue.
- B. Metal joints shall be watertight. Metal flashings shall be securely fastened into metal stud backing plates or wood substrate. Fasteners shall penetrate the metal studs or wood substrate. Counter flashings shall overlap base flashings at least four (4) inches. Hook strips shall extend past metal studs and shall be securely sealed from air entry.

3.12 WALKWAY INSTALLATION

- A. Sarnatred Walkway: Apply a continuous coat of Stabond adhesive to the deck sheet and the back of Walkway in accordance with Sika Sarnafil's Technical requirements and press Walkway into place with a water-filled, foam-covered roller. Hot-air weld the entire perimeter of the Walkway to the field membrane.

3.13 TEMPORARY CUT-OFF

- A. Flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses:
 - 1. Temporary waterstops shall be constructed to provide a 100% watertight seal.
 - 2. Stagger of the insulation or cover board joints shall be made even by installing partial panels.
 - 3. New membrane shall be carried into the waterstop sealant.
 - 4. Waterstop shall be sealed to the deck and/or substrate so that water will not be allowed to travel under the new or existing roofing.
 - 5. When work resumes, the contaminated membrane shall be cut out.
 - 6. Sealant, contaminated membrane, insulation fillers, etc. shall be removed from work area and properly disposed of offsite. These materials shall not be used in new work.
- B. If inclement weather occurs while temporary waterstop is in place, Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.
- C. If water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

3.14 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's Representative.

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

3.15 PROTECTION AND CLEANING

- A. Protect membrane 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, provide written report, with copies to the Owner's Representative.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Contract Completion and according to warranty requirements.

3.16 DEMONSTRATION

- A. Provide maintenance documents and personnel instruction for the facilities staff and other interested parties at a single pre-determined mutually convenient time. The instruction shall include the following topics:
 - 1. Access restriction and precautions.
 - 2. Avoiding mechanical damage.
 - 3. Potential contaminants and rectification.
 - 4. Cleaning.
 - 5. Emergency repairs.
 - 6. Procedures for permanent repairs and alterations.

END OF SECTION