

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Install a mechanically fastened thermoplastic PVC roofing system including membrane, flashings and other components.
- B. The work includes but is not limited to:
  - 1. Verify all roof drains are free flowing
  - 2. Drain refurbishment/replacement with retrofit drains
  - 3. Preparation of existing roof including removal and replacement of deck/installation of sheathing as required
  - 4. Removal of redundant equipment and walkways.
  - 5. Removal of selected membrane and metal flashings including all edge metal.
  - 6. Preparation of existing roof surface, removal of base flashings and cant strips.
  - 7. Fasteners for membrane attachment.
  - 8. Felt backed, polyester reinforced PVC roof membranes.
  - 9. PVC clad metal and fasteners.
  - 10. Low-VOC contact adhesive for flashings.
  - 11. Glass fiber reinforced asphalt tolerant PVC flashing membrane.
  - 12. Heavy-duty flexible walkways.
  - 13. Provide new Sarnaclad edge metal or Kynar coated coping metal
  - 14. Provide new pipe supports (Durablock or similar)
  - 15. Other metal flashings.
  - 16. Sealants
  - 17. Roof Labeling.
- C. Related Work:
  - 1. Section 07 62 00 for sheet metal flashing and trim
  - 2. Section 06 10 53 for miscellaneous rough carpentry.

### 1.2 REGULATORY REQUIREMENTS

- A. These requirements are minimum standards. Do not perform roofing work without written documentation of the system's compliance, as required in the "Submittals" section of this specification.

- B. Field and flashing membranes shall conform to ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing":
  - 1. Classification: Type II, Grade I.
  - 2. Classification: Type III.
- C. Factory Mutual Research Corporation (FM) - Norwood, Massachusetts:
  - 1. Class 1-90
- D. Underwriters Laboratories, Inc. - Northbrook, Illinois:
  - 1. Class A assembly

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittals
  - 1. Samples of each primary component to be used in the roof system
  - 2. Manufacturer's current product data literature for each component to be used in the roof system.
  - 3. Evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the required test organizations.
- B. Sequencing:
  - 1. Furnish shop drawings, for redesigned details. Where necessary, provide instructions for this work.
  - 2. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage.
    - a. Where such access is absolutely required, provide necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas.
    - b. Provide a substantial protection layer consisting of plywood over Sarnafelt or plywood over insulation board for all roof areas that receive concentrated rooftop traffic during construction.

### 1.4 QUALITY ASSURANCE

- A. Applicator/Roofing Contractor Qualifications
  - 1. The Roofing Contractor must be authorized by the Manufacturer at least 5 years prior to date of bid.
  - 2. Only Applicator personnel trained and authorized by the Manufacturer are permitted to complete work pertaining to the installation of membrane and flashings.

3. Track Record – Install only PVC Roofing systems from manufacturers able to demonstrate the product on 5 existing functional roofs =>20 year old roofs with the same membrane formulation within 200 miles of the proposed project.
  4. Use only a Manufacturer who has initiated a post consumer recycling program and can demonstrate a minimum of five projects where the existing PVC roof has been removed and recycled into new roofing membrane or PVC components.
  5. Use only a Manufacturer certified ISO 14001: 2004 and RC 14001: 2008 responsible care.
  6. Unreinforced or polyester reinforced membrane base flashings are prohibited.
  7. No “Private Label” or third party membrane manufacturers will be approved alternates or substitutes.
- B. Manufacturer Inspections
1. The Manufacturer must provide interim and final roof inspection from a directly employed dedicated team of experienced inspectors.
  2. Sales personnel may not be used for onsite inspection of installations.
- 1.5 PRE-INSTALLATION MEETINGS
- A. Convene a pre-installation meeting with Applicator/Roofing Contractor, Owner's Representative, and Consultant.
- B. The meeting shall discuss all aspects of the project including but not limited to:
1. Safety
  2. Set up
  3. Construction schedule
  4. Contract conditions
  5. Coordination of the Work
- 1.6 HANDLING
- A. Delivery: Accept only products delivered to the job site in the original unopened containers or wrappings bearing all seals and approvals.
- B. Storage:
1. Handle materials to prevent damage. Place materials on pallets and fully protect from moisture.

2. Store membrane rolls lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted.
3. Store adhesives at temperatures between 40°F and 80°F.
4. Store flammable materials in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer and/or supplier.
5. Remove damaged materials from the job site.
6. Load materials on the rooftop in such a manner to eliminate risk of deck overload due to concentrated weight.

#### 1.7 PROJECT CONDITIONS

- A. Schedule and execute Work of this section without exposing the interior building areas to the effects of inclement weather.
- B. Secure new and temporary construction, including equipment and accessories, to preclude wind blow-off and roof or equipment damage.
- C. Install uninterrupted waterstops at the end of each day's work. Completely remove before proceeding.
- D. Prior to and during application, remove all excessive moisture, dirt, debris and dust.
- E. Immediately take all existing and new roofing, insulation, flashings and metal work removed during construction to a legal dumping area authorized to receive such materials.
- F. If any water is allowed to enter under the newly completed roofing, remove wet and damaged materials, and provide new.

#### 1.8 WARRANTY

- A. Upon successful completion of work the following warranties must be provided:
  1. 20 Year Full System Warranty (60 mph maximum wind speed)
  2. 2 Year Roofing Contractor Warranty
- B. Manufacturer's System Warranty
  1. Provide a "No Dollar Limit" non-prorated System Warranty that does not exclude ponding or standing water or contain time limits for standing water.

2. No additional fees or roofing manufacturer inspections will be required to maintain the warranty.
  3. The System Warranty includes membrane, insulation, cover board and attachment components of the roofing system provided by the Manufacturer.
- C. Applicator/Roofing Contractor Warranty
1. Provide a separate workmanship warranty by the Applicator/Roofing Contractor.
  2. In the event any work related to roofing, flashing, or metal is found to be within the Applicator/Roofing Contractor warranty term, defective or otherwise not in accordance with the Contract Documents, the Applicator/Roofing Contractor shall repair that defect at no cost to the Owner.
  3. The warranty obligation of the Applicator/Roofing Contractor shall run directly to the Owner, and be copied to the Manufacturer.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The components of the PVC membrane roof system are to be products of Sika Sarnafil (Canton, Massachusetts; local contact 310-528-3348), and as previously installed at Oak Park USD.

### 2.2 MATERIALS

- A. Field Membrane – PVC reinforced membrane with a lacquer coating.
1. S327-18FB Polyester Reinforced Felt Backed PVC, thickness 69 mils minimum.
  2. Color California Title 24 compliant White.
- B. Sheathing (as leveling for roofing substrate) – Manufacturers approved gypsum, fire-tested hardboard. Georgia Pacific Dens Deck is provided in a 4 x 8 ft board size and in 1/4 inch minimum thickness.
- C. Flashing Membranes
1. G410-15 and G459-15 Glass Fiber Reinforced PVC, 58 mils minimum thickness with fiberglass reinforcement.

2. Membrane weight minimum 0.36 pounds per square foot.
3. Color to match main field sheet.

D. PVC Clad Metal

1. Standard PVC clad metal supplied by roofing system Manufacturer. Bronze or Copper Brown color as directed.

E. Universal PVC Prefabricated Stack

1. A prefabricated vent pipe flashing made from 0.060 inch thickness PVC.

F. Prefabricated PVC Corners

1. Prefabricated outside and inside flashing corners made of 0.060 inch thick PVC.

G. PVC Walkway Protection

1. A rolled-out, free-draining walkway protection mat used to protect PVC roofing membrane from mechanical abuse.
2. CrossGrip Walkway is 9/16 inch thick flexible PVC with a heavily textured surface.

H. Pipe supports

1. Provide Durablock or equal pipe supports and hot air weld a sacrificial flashing membrane pad under the block extending 6 inches in all directions.

I. Insert Drains – provide RAC Overflow drains, provided and warranted by roofing system manufacturer.

J. Roof Drains – refurbish existing cast iron drains or provide RAC Insert drains, provided and warranted by roofing system manufacturer.

## 2.3 ATTACHMENT COMPONENTS

A. Sarnafastener-MAXLoad

1. A specially designed, heavy-duty, corrosion-resistant fastener used to secure Sarnadisc-MAXLoad and Sarnafil S327 roof membrane to roof decks. Acceptable substrates include 22-24 gauge steel and 1/2-5/8 wood roof decks. Sarnafastener-MAXLoad has a shank diameter of approximately 0.26 inch and a thread diameter of approximately 0.33 inch.

B. Sarnadisc-MAXLoad

1. A large diameter high strength plate used with the Sarnafastener-MAXLoad to attach the Sarnafil S327 roof membrane. Sarnadisc-MAXLoad is a 20 gauge, 3.5 inch, round corrosion resistant steel plate.

C. Flashing Adhesive

1. A low VOC reactivating-type adhesive used to attach membrane to flashing substrate.
2. Stabond U148A Adhesive.

D. Peelstop

1. An extruded aluminum, low profile bar used with certain fasteners to attach to the roof deck or to walls/curbs at terminations, penetrations and at certain incline changes of the substrate.

E. Termination Reglet

1. A heavy-duty, extruded aluminum flashing termination reglet used at walls and large curbs.

F. Miscellaneous Fasteners and Anchors

1. Provide only post-galvanized steel, aluminum or stainless steel fasteners. Take precautions to avoid galvanic corrosion from dissimilar metals.
2. Install expansion type fasteners with stainless steel pins for the attachment of metal to masonry.
3. The minimum embedment for miscellaneous fasteners and anchors is as follows:
  - a. 1-1/4 inch at concrete.
  - b. 1 inch at wood/steel.

2.4 SEALANTS

A. Multi-Purpose Sealant (for termination details).

1. Sika 1A or approved equal.

B. Approved urethane adhesive sealant Sika 11FC.

- C. Depending on substrates, the following sealants are options for temporary overnight tie-ins:
  - 1. Spray-applied, water-resistant urethane foam.
  - 2. Mechanical attachment with rigid bars and compressed sealant.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify the roof deck and roof construction is structurally sound to provide support for the new roof system.
- B. Verify that the work done under related sections meets the following conditions:
  - 1. Roof drains and overflows/or scuppers have been reconditioned and/or replaced and installed properly.
  - 2. Verify drains are free flowing; report any exceptions to the owners' representative with 24 hours to allow corrective action.
  - 3. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
  - 4. All surfaces are smooth and free of dirt, debris and incompatible materials.
  - 5. All roof surfaces are free of water, ice and snow.
- C. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

### 3.2 PREPARATION

- A. Demolish redundant equipment
- B. Refurbish or replace drains
- C. Remove base flashings and cant strips
- D. Remove wood blocking, reglets and deteriorated metal flashings.
- E. Remove all pitch pockets
- F. Remove walkway pads
- G. Provide new Pelican Hoods as required



- H. Raise small curbs lower than 6 inches in height.
- I. Sweep and clean all existing roofing leaving field sheet in place.
- J. Remove all existing stack flashings and provide new.

### 3.3 INSTALLATION OF SARNAFIL MEMBRANE

#### A. General:

1. Attach Sarnafil S327 membrane through the existing roof assembly into the plywood deck with Sarnafasteners according to Sika Sarnafil and Factory Mutual's requirements. Fasteners must penetrate the deck by a minimum of 1 inch.
2. Install Sarnafasteners and Sarnadiscs along the edge of the membrane on the fastening line at a spacing determined by Sika Sarnafil. Clamp the S327 membrane tightly to the substrate.
3. Tack welding of S327 full or half-width rolls for purposes of temporary restraint during installation is not permitted.

#### B. Perimeter and Corner Areas

1. Install minimum 2 number S327 half-width rolls either parallel or perpendicular to the entire perimeter edge. The number of adjacent half-rolls will be determined by building height and width and other conditions according to FM guidelines and Sika Sarnafil Technical. In corner areas where perimeter half-rolls intersect, and where 10 feet wide rolls must be used provide additional rows of Sarnafasteners and Sarnadiscs and a welded coverstrip.

#### C. Interior Area

1. Install S327 full-width rolls.
2. Hot-air weld overlaps according to Sika Sarnafil's recommendations. Take seam test cuts at least 3 times per day.
3. Securement Around Rooftop Penetrations
4. Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations, install Sarnafasteners and Sarnadiscs according to perimeter rate of attachment.
5. Overlap Sarnafil membrane flashings 2-1/4 inches past the Sarnadisc Maxload. Hot-air weld to the Sarnafil deck membrane.

#### D. Hot-air Welding of Seam Overlaps

1. Hot air weld all seams in accordance with Manufacturer requirements.

2. Weld only clean and dry membrane.
- E. Membrane Flashings
1. Install flashings concurrently with the roof membrane as the job progresses.
  2. Adhere flashing materials to compatible surfaces only. Use caution to ensure adhesive fumes are not drawn into the building.
  3. Apply low-VOC contact adhesive in smooth, even coats with no gaps, globs or similar inconsistencies. Press the bonded sheet firmly in place with a hand roller. Do not apply adhesive in seam areas. Apply membrane panels uniformly.
  4. Encapsulate parapets in preparation for new metal coping.
  5. The minimum flashing height is 8 inches above finished roofing level unless otherwise accepted by Manufacturer in writing.
  6. Mechanically fasten all flashing membranes along the counter-flashed top edge with peelstop bar, reglet, or approved alternate at 6 to 8 inches on center.
  7. Additionally secure all adhered flashings that exceed 30 inches in height. Consult Manufacturer's technical department for securement methods for such conditions.
- F. Provide new Kynar Coping to match existing color and size or provide PVC Clad Metal Edge Metal as follows;
1. Form and install PVC clad metal flashings to match existing.
    - a. Fasten all metal flashings into approved substrates or solid wood nailers with two rows of approved fasteners spaced 4 inches on center, staggered.
    - b. Install metal flashings to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
    - c. Overlap base flashings with counter flashings at least 4 inches.
  2. Space adjacent sheets of PVC clad metal 1/4 inch apart. Fasten the end joints of the PVC clad metal 6 inches on center. Cover the joint with 2-inch wide aluminum tape. Hot air weld a 4 inch minimum wide strip of PVC flashing membrane over the joint.
- G. Walkway Installation
1. Check all existing deck membrane seams that are to be covered by Walkway with rounded screwdriver, and reweld any inconsistencies before Walkway installation.

2. Secure the PVC walkway to top of clean, completed PVC membrane roof assemblies with loops of PVC membrane welded to the field sheet at 24 inches o.c.

### 3.4 TEMPORARY CUT-OFF

- A. Construct all temporary waterstops to provide a 100% watertight seal.
- B. Maintain the stagger of insulation joints by installing partial panels of insulation as necessary.
- C. Carry the new membrane into the temporary waterstop.
  1. Seal the waterstop to the deck and/or substrate so that water will not be allowed to travel under the new roofing or insulation.
  2. Seal the edge of the membrane in a continuous heavy application of sealant.
- D. Cut out contaminated membrane, insulation and/or cover board before resuming work.

### 3.5 FIELD QUALITY CONTROL

- A. Quality Control of Welded Seams
  1. Check all welded seams for continuity using a rounded screwdriver.
  2. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane.
  3. On-site evaluation of welded seams shall be made daily at locations as directed by the Consultant, Owner's Representative, and/or Manufacturer's representative.
    - a. Take 1-inch wide cross-section samples of welded seams at least 3 times a day.
    - b. Correct welds display failure from shearing of the membrane prior to separation of the weld.
    - c. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

B. Interim and Final Inspections

1. Upon completion of the installation and the delivery to Manufacturer by the Applicator of a certification that all work has been done in strict accordance with the contract specifications and Manufacturer's requirements, an inspection shall be made by a Specialist Technical Representative (not a salesperson) of Manufacturer to review the installed roof system.

3.6 DEMONSTRATION

- A. Provide maintenance documents and personal instruction for the facilities staff and other interested parties at a single pre-determined mutually convenient time.
- B. 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

3.7 PROTECTION

- A. Protect adjacent finished surfaces in place during the construction period to prevent mars, marks, other damage and stains until acceptance by the Owner. Remove protection when no longer needed.
- B. Restore damaged areas to match adjacent areas as approved by the Owner.
- C. Remove and replace materials and components that are damaged, loose, broken, have been stained, corroded, or that do not match adjacent surfaces, materials or finishes, or cannot be satisfactorily cleaned or repaired, as determined and directed by the Owner.

3.8 COMPLETION

- A. Correct all punch-list items to the satisfaction of the Architect, Owner and manufacturer prior to demobilization.

END OF SECTION