

SECTION 07542

POLYVINYL-CHLORIDE ROOFING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes the following:
  - 1. Fully adhered single ply polyvinyl-chloride (PVC) membrane roofing system at main roof.
  - 2. Mechanically attached single ply polyvinyl-chloride (PVC) membrane roofing system at Penthouse level structures, light courts and over mechanical room on 3<sup>rd</sup> floor.
- B. Related Sections:
  - 1. Wood nailers and blocking are specified in Section 06101.
  - 2. Roof board insulation is specified in Section 07220.
  - 3. Sheet metal flashing and trim is specified in Section 07620.

1.02 SUBMITTALS

- A. Product Data: Copies of manufacturer's printed product data and specifications. Include data substantiating that materials comply with specified requirements.
- B. Shop Drawings: Show roof configuration and sheet layout at 1/8-inch = 1'-0" minimum, seam locations, details at perimeter, penetrations at mechanical equipment, plumbing and electrical penetrations, and other conditions as required, drawn at 3" = 1'-0" minimum. Indicate adjacent conditions.
- C. Pre-Roofing Conference: Copies of pre-roofing conference records.
- D. Certification that materials comply with local VOC limitations.
- E. Certification that materials are compatible with sealants and waterproof flashings at perimeter conditions.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Obtain primary materials from a single manufacturer. Provide secondary materials as recommended by manufacturer of primary materials.
- B. Installer: Not less than 5-years experience in installation of roofing systems similar to those required for this Project, acceptable to or licensed by manufacturer of roofing materials.
- C. Pre-Roofing Conference: Prior to installation of roofing and associated work, meet at Project site with installer, roofing materials manufacturer, installers of related work and others concerned with roofing performance. Record discussions and agreements and furnish copy to each participant. Provide at least 72-hours advance notice to participants prior to convening pre-roofing conference.
- D. Labels and Approvals: Provide labeled materials that have been tested and listed by Underwriters' Laboratories (UL) in "Building Materials Directory" or by other nationally recognized testing laboratory for application indicated, with Class A rated materials/system for roof slopes indicated.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in their original, tightly-sealed containers or unopened packages.
- B. Materials shall be clearly labeled with the manufacturer's name and product identification.
- C. Protect materials from damage during transit, handling, storage, and installation. Place materials on pallets and protect from moisture.
- D. Store materials in a dry area, protected from the elements. Store membrane rolls flat on pallets.

- E. Store adhesive shall be stored at temperatures above 40-deg. F.
- F. Store flammable materials in a cool, dry area away from sparks and open flames. Follow precautions outlined by material manufacturer/supplier.

#### 1.05 JOB CONDITIONS

- A. Only as much new roofing as can be made weathertight each day shall be installed each day. This includes all flashing work.
- B. Substrates to receive new insulation, membrane or flashing shall be thoroughly dry. Should surface moisture occur, provide adequate equipment to dry the substrate.
- C. Prior to and during application, remove dirt, debris and dust from surfaces to be roofed for both new and reroofing substrates.
- D. Take precautions to prevent wind blow-off or wind damage during the course of the roofing application.
- E. Verify and ensure that roof drain lines are unblocked before starting work.
- F. Install temporary waterstops at the end of each day's work or if inclement weather conditions dictate. Remove temporary waterstops at the start of the next day's work and properly dispose of.
- G. Do not install the roofing membrane in direct contact with any product containing asphalt, coal tar pitch, creosote or penta-based materials.
- H. Do not allow waste products containing petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the roofing membrane.
- I. Follow safety regulations as recommended by OSHA.
- J. Schedule and execute work without exposing interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against risks. Arrange work sequences to avoid use of newly constructed roofing for storage, walking surfaces and equipment movement. Provide necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If excessive foot traffic over newly installed membrane is necessary, provide plywood or polyester felt protection to prevent damage.
- K. Report unusual or concealed conditions discovered during the course of the work to the Architect in writing. Stop work until the Architect has responded with a solution to the problems.
- L. When a system is specified to meet an Underwriter's Laboratories, Inc. rating, materials used in the system must be UL labeled and approved for that particular system.
- M. Comply with the requirements of local building codes and requirements.
- N. Do not use products near fire or flame.
- O. Avoid breathing vapors of solvent, sealant and adhesives. Use with adequate ventilation. Avoid prolonged contact of solvents, sealants and adhesives with skin.
- P. Do not use open flames to expedite drying of surfaces, sealants, or adhesives.
- Q. Consult Material Safety Data Sheets and container labels for specific safety instructions.

#### 1.06 WARRANTY

- A. Furnish written warranties from the roofing system manufacturer covering labor and materials for 20-years from date of Substantial Completion. The warranties shall include no disclaimer for failure or leakage caused by structural movement within the existing roof deck.
- B. The terms of the warranty shall provide for the removal, replacement, repair, and making good, without cost to the Owner, of defects due to imperfect materials and workmanship.

- C. All repairs required under the warranty shall be made within 3-days after receiving notice of the need for repairs from the Owner, weather permitting.

## PART 2 - PRODUCTS

### 2.01 APPROVED MANUFACTURER

- A. Fully Adhered System: Sarnafil G410-18 or equal by Firestone, Stevens, Johns Manville, Trocal or approved equal.
- B. Mechanically Attached System: Sarnafil S327-15 or equal by Firestone, Stevens, Johns Manville, Trocal or approved equal.

### 2.02 ROOF MEMBRANE

- A. PVC Roofing Membrane:
  - 1. Thickness: 72-mils nominal at fully-adhered system, 60-mils nominal at mechanically attached system.
  - 2. Membrane shall conform to ASTM D4434.
  - 3. Color: White, having an initial reflectivity of 0.83, initial emissivity of 0.92 and solar reflective index (SRI) of <104.
- B. Solvent: Solvent welding solution as recommended by roofing membrane manufacturer.
- C. Seam or Lap Sealant: Liquid PVC sealing compound, with a consistency equal to that of "honey" at room temperature.
- D. Caulk: Single component, non-sag elastomeric polyurethane sealant.
- E. Aluminum Foil Tape: 3-mil thick aluminum foil tape with acrylic adhesive, for use over metal joints prior to strips being welded over the joints.
- F. Flashing Metal: 24-gauge galvanized steel laminated to 40-mils of roofing membrane in white, grey and black colors used for flashing and edge metal detailing.
- G. Termination Bar: Extruded aluminum bar 3/32-inch thick for use in terminating adhered, reinforced membrane base flashings in certain constructions.
- H. Walkway: Rolled-out walkway protection mat, 9/16-inch thick flexible PVC with a heavily textured surface. Walkway shall be loose-laid on top of completed roof membrane assembly.
- I. Prefabricated Details: Provide inside/outside corners, PVC vent pipe boots in sizes to fit pipes from 3/4- to 11-inches, and PVC pitch-pocket.
- J. Pitch-Pocket Filler: Polyurethane pourable sealer for use in pitch pockets.
- K. Joint Cover Strips: For use in waterproofing joints of metal.
- L. Attachment Components:
  - 1. Plates: 3-inch square or round, 26-gauge stamping of steel with an AZ 55 galvalume coating.
  - 2. Fastener: #12 corrosion-resistant fastener to attach insulation boards to deck substrates.
- M. Adhesive: Water-based adhesive for attaching membrane to substrates.
- N. Overlayment Board:
  - 1. At Mechanically-Attached Membrane: Georgia Pacific "Dens-Deck" or approved equal fire-rated gypsum hardboard with glass-mat facers, 1/4-inch thick.

2. At Fully-Adhered Membrane: Georgia Pacific "Dens-Deck Prime" or approved equal fire-rated gypsum hardboard with glass-mat facers and a pre-primed surface on one side, ½-inch thick.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. When installing roofing in cooler weather, liquids such as solvents, adhesives, sealants, etc. shall be stored at minimum 40-deg. F. until just prior to use in order to facilitate the installation.

### 3.02 SUBSTRATE CONDITIONS

- A. The roof substrate shall be acceptable to the roofing manufacturer to receive the required type of roofing membrane. Areas showing a loss of integrity due to corrosion, rotting, warping, concrete spalling, etc., shall be repaired or replaced prior to installing the roofing system.
- B. Contact the material manufacturer when the substrate is exposed to excessively high humidity and/or a corrosive environment. Special fasteners or details may be required.
- C. Install specified overlayment board over roof board insulation in accordance with manufacturer's instructions. Neatly cut to fit around penetrations and projections. Do not install more overlayment board than can be covered with roof membrane by the end of the day or the onset of inclement weather.

### 3.03 MEMBRANE INSTALLATION

- A. Unroll sheet roofing and position without stretching the membrane. Allow the membrane to relax at least 15-minutes when the temperature is above 60-degrees F., or 30-minutes when the temperature is below 60-degrees F., prior to installation. Inspect for damage. Remove sections of membrane that are creased or damaged. Lap sheets as recommended by manufacturer depending on fastening method to be used.
- B. Fully-adhered Membrane Application: Install in accordance with manufacturer's instructions.
  1. Apply adhesive over overlayment board and spread using notched squeegees. Apply at manufacturer's recommended rate.
  2. Unroll membrane into the wet adhesive while the edges are overlapped 3-inches. Press firmly into the wet adhesive while the edges are overlapped 3-inches.
  3. Press firmly into the adhesive layer with a water-filled, foam-covered lawn roller by frequent rolling in two directions.
- C. Mechanically Attached Membrane Application: Install membrane over specified overlayment board with mechanical fasteners in accordance with manufacturer's instructions. Membrane overlap shall be shingled with the flow of water.
  1. Perimeter and Corner Areas: Install half-width rolls of membrane parallel with the perimeter edge. Install fasteners along the edge of the membrane on the fastening line spaced as recommended by membrane manufacturer. Hold back fasteners 1-inch from the outer edge of the membrane. Position adjacent half-roll to overlap the fastened edge by 5-1/2-inches. Hot air weld overlaps in accordance with manufacturer's instructions.
  2. Interior Area: Install full width rolls of membrane and mechanically fasten in accordance with membrane manufacturer's instructions. Hold back fasteners 1-inch from the outer edge of the membrane. Position adjacent full roll sheets to overlap the fastened edge by 5-1/2-inches. Hot air weld overlaps in accordance with manufacturer's instructions.

### 3.04 WELDING OF SEAMS

- A. Welding of Lap Areas: After the preheated nozzle tip is applied in the overlap area and the material starts to flow, immediately follow with a hand roller to press the heated membrane surfaces together with slow, even movements. Keep the roller within 1-inch of the nozzle tip. Angle the hot air tool so that the flowing air faces the roller. The temperature of the hot air tool shall be adjusted so that a minimum amount of smoke is developed and material from the bottom of the sheet begins to soften and flow from the seam. Test seam strength 8-hours after hot air welding.
- B. Quality Control of Seams: After heat welding, the seams shall be checked for integrity with a blunt-ended probe.

Any openings or "fishmouths" shall be repaired with a hand-held hot air tool fitted with a narrow nozzle tip and with a roller. Each day, several sections of welded seams shall be pulled apart to test the quality of the welds. Should the welds be deficient, a more thorough examination of the work performed shall be carried out and necessary repairs made. Seal the membrane edges where reinforcing fabric is cut and exposed with seam sealant at the end of each day.

- C. Perimeter Attachment: Secure attachment of the PVC roofing membrane at the perimeter and at penetrations by mechanical fastening using high load fasteners and plates or other fastener system approved by roof membrane manufacturer.

### 3.05 FLASHING INSTALLATION

#### A. Metal Flashing:

1. Install metal flashing in accordance with manufacturer's instructions and recommendations.
2. Complete metal work concurrently with roofing and flashings so that a watertight condition exists daily.
3. Provide metal transitions required at peaks, valleys and slope intersections where the net change in slope exceeds 1-1/2-inch in 12-inches.
4. Install metal to provide adequate resistance to bending and to allow for normal thermal expansion and contraction.
5. Metal joints shall be watertight and staggered over nailer joints to prevent joints in nailers and joints in metal from lining up.
6. Extend base flashings a minimum of 6-inches up vertical surfaces.
7. Metal flashings and terminations shall be securely fastened in the plane of the roof deck with fasteners recommended by the roofing system manufacturer.
8. Fasteners and roofing nails used to secure flashings to wood nailers shall be stainless steel, galvanized metal or other corrosion resistant material, with a head diameter of not less than 3/8-inch, and with fastener penetration into the wood nailer of at least 3/4-inch.
9. Fabricate metal with hemmed edges to prevent sharp metal edges from cutting the membrane, except when in conjunction with wood nailers.
10. Membranes flashings are not acceptable for use on this Project unless the use of sheet metal is not feasible.

### 3.06 WALKWAY INSTALLATION

- A. Install walkway material over clean, dry surfaces.
- B. Loose lay on top of completed roof membrane assemblies. Where design wind speeds exceed 94-mph, secure with loops of membrane welded to the field sheet.

### 3.07 WATERSTOPS

- A. Install temporary cutoffs around incomplete edges of roofing assembly at the end of each day's work and when work must be postponed due to inclement weather. Straighten the insulation line using pieces of insulation loosely laid, and seal the sheet membrane to the deck or existing membrane. Use a heavy application of roof cement or hot asphalt at least 6-inches in width overlaid with an embedded reinforcement. Remove the temporary seals completely when work resumes, cutting out the contaminated membrane. Remove sealant, contaminated membrane, insulation fillers, etc. from the work area and properly dispose off-site.

END OF SECTION