

# Nevada County Wayne Brown Correctional Facility Roof Replacement

This project is for the replacement of the existing Sarnafil single ply, roof at the 60,000 +- sq ft Nevada County Wayne Brown Correctional Facility, 925 Maidu Ave., Nevada City CA, 95959. This specification is for Sika Sarnafil S 327 RhinoBond System, but **any equal PVC system may be presented. To be considered for an equal system, the contractor needs to supply County with all items listed in Section 1.03 at time of bid.**

This project includes but is not limited to: Remove existing 60 mil PVC membrane, plates and fasteners and perlite board down to existing foil ISO. Replace ISO as needed if damaged or wet with equal thickness of new ISO insulation. Install diversion material to allow all water to flow to drains. Lay ½" DensDeck over ISO and fasten with RhinoBond plates and approved fasteners per specifications. Install S327 80 mil membrane over cover board, weld to plates as per manufactures specification. Remove and install all new cap flashings. Install walk pads as required. Work to include the roof replacement on the generator room as well. Contractor is responsible for field verifying all dimensions. Any drawings are for reference only. The owner will be provided with a 30 year warranty.

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## **INTRODUCTION TO SIKA SARNAFIL S327 RHINOBOND SYSTEM**

The Sika Sarnafil RhinoBond Roofing Systems use the polyester reinforced Sarnafil S327 roof membrane. The S327 membrane is welded directly to the 3 inch (76 mm) diameter polymer coated metal Sarnadisc. The S327 RhinoBond Roofing System is described as follows:

### **System Description**

S327 RhinoBond Metal Retrofit is a non-penetrating system that uses 3 inch (76 mm) diameter, polymer coated metal discs. Adjacent membrane panels are lapped and overlaps are heat-welded with a Sarnamatic hot-air welder. The S327 membrane is then induction welded to the RhinoBond plate.

The advantages of the S327 RhinoBond Roofing System are speed at which a building can be “dried-in”, simplicity of design and minimizing sheet flutter. The S327 RhinoBond System is a cost-effective, non-penetrating Roofing System using the Sarnafil S327 membrane.

S327 utilizes a high-strength polyester reinforcement that allows the system to exceed Factory Mutual requirements for wind uplift testing. The manufacturing process imparts dimensional stability and minimizes water-wicking by the reinforcement. S327 is lacquer-coated on the weathering surface to reduce dirt pick up; a Sarnafil membrane exclusive feature. It is available in EnergySmart® white and other colors.

S327 is marked at the factory with seam overlap lines with the 3 inch (76 mm) line used for aligning the sheets and creating the overlap.

We welcome you to review the following Guide Specification and Detail Drawings and we ask that you contact us if you have any questions or need any additional information.

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**SECTION 07 54 19  
THERMOPLASTIC MEMBRANE ROOFING  
RHINO BOND SYSTEM**

**PART 1 - GENERAL CONDITIONS****1.01 DESCRIPTION****A. Scope**

Remove existing PVC membrane, plates and fasteners and ½" perlite board down to existing ISO. Replace ISO as needed if damaged with equal thickness new ISO insulation. Install diversion material to allow all water to flow to drains. Lay ½" DensDeck over ISO and fasten with RhinoBond plates and approved fasteners per specifications. Install S327 membrane over cover board, weld to plates as per specification. Remove and install all new flashings. Install walk pads as required.

**B. Related Work**

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

1. Substrate Preparation
2. Roof Drains
3. Insulation
4. Roof Membrane
5. Fasteners
6. Adhesive for Flashings
7. Roof Membrane Flashings
8. Walkways
9. Metal Flashings
10. Sealants

**C. Upon successful completion of work the following warranties may be obtained:**

1. Sika Sarnafil Warranty including repair of all leaks except those caused by Owner for a period of **30 Years**

**1.02 QUALITY ASSURANCE**

**A.** This roofing system shall be applied only by a Roofing Applicator authorized by Sika Sarnafil prior to bid (Sika Sarnafil "Applicator").

**B.** Prior to the installation a meeting with a Sika Sarnafil Technical Service Representative and the owner will be conducted.

**C.** Upon completion of the installation and the delivery to Sika Sarnafil by the Applicator of certification that all work has been done in strict accordance with the contract specifications and Sika Sarnafil's requirements, will review the installed roof system wherever a System Warranty has been specified.

**D.** There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Owner's Representative and Sika Sarnafil.

**E.** All work pertaining to the installation of Sarnafil membrane and flashings shall only be completed by Applicator personnel trained and authorized by Sika Sarnafil in those procedures.

**F.** Roofing membrane manufacturer must have a demonstrated performance history of producing PVC roof membranes no less, in duration of years, than the warranty duration specified.

- G. Product to be manufactured by membrane supplier and not private labeled.
- H. Manufacturer to have a minimum of five years' experience recycling their membranes at the end of their service life back into new membrane products. Provide a minimum of five reference projects.

**1.03 SUBMITTALS**

If product is other than Sika Sarnafil as specified in this specification, at the time of bidding, the Applicator shall submit to the Owner the following:

- A. Copies of Specification.
- B. The manufacturer's current literature for each component.
- C. Sample copy of 30 Year warranty against all leaks not caused by owner.
- D. Certifications by manufacturers of roofing and insulating materials that all materials supplied comply with all requirements of the identified ASTM and other industry standards or practices.
- E. Certification from the Applicator that the system specified meets all identified code and insurance requirements as required by the Specification.
- F. Material Safety Data Sheets (MSDS)

**1.04 CODE REQUIREMENTS**

The Applicator shall submit evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the following test organizations. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in the "Submittals" section of this specification.

- A. System shall be designed to meet a minimum wind design requirements of the most recent version of ASCE 7.
- B. Factory Mutual Research Corporation (FM) - Norwood, MA
  - 1. Class 1-60 (required for most situations)
- C. Underwriters Laboratories, Inc. - Northbrook, IL
  - 1. Class A assembly

**1.05 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.
- B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.
- C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.
- D. As a general rule all adhesives shall be stored at temperatures between 40 degree F (5 degree C) and 80 degree F (27 degree C). Read instructions contained on adhesive canister for specific storage instructions.
- E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow



precautions outlined on containers or supplied by material manufacturer/supplier.

- F. Any materials which the Owner's representative or Sika Sarnafil determine to be damaged are to be removed from the job site and replaced at no cost to the Owner.
- G. The existing PVC roof membrane is to be recycled by the manufacturer of the replacement membrane. Applicator is responsible for all costs associated with removing the membrane, preparing it and loading it for shipment, according to the manufacturer's published procedures.

#### **1.06 JOB CONDITIONS**

- A. Sarnafil materials may be installed under certain adverse weather conditions but only after consultation with Sika Sarnafil, as installation time and system integrity may be affected.
- B. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned and heat welded before leaving the job site that day.
- C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.
- D. All surfaces to receive new insulation, membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.
- E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- F. 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. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
- G. The Applicator is cautioned that certain Sarnafil membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with Sarnafil membranes. The Applicator shall consult Sika Sarnafil regarding compatibility, precautions and recommendations.
- H. 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 plywood over Sarnafelt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.
- I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces by vacuuming, sweeping, blowing with compressed air or similar methods.
- J. The Applicator shall follow all safety regulations as required by OSHA and any other applicable authority having jurisdiction.
- K. All roofing, insulation, flashings and metal work removed during construction shall be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, are to be removed and disposed of in strict accordance with applicable City, State and Federal requirements.
- L. All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material.
- M. The Applicator shall take precautions that storage and application of materials and equipment does not overload the roof deck or building structure.

- N. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.
- O. All rooftop contamination that is anticipated or that is occurring shall be reported to Sika Sarnafil to determine the corrective steps to be taken.
- P. 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 in writing (letter copy to Sika Sarnafil) to the Owner's Representative for corrective action prior to the installation of the Sika Sarnafil roof system.
- Q. Applicator shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Owner of such condition in writing for correction at the Owner's expense (letter copy to Sika Sarnafil).
- R. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to the Owner's satisfaction.
- S. All landscaped areas damaged by construction activities shall be repaired at no cost to the Owner.
- T. The Applicator shall conduct fastener pullout tests in accordance with the latest version of the SPRI/ANSI Fastener Pullout Standard to verify condition of the deck/substrate and to confirm expected pullout values.
- U. The Sarnafil membrane shall not be installed under the following conditions without consulting Sika Sarnafil's Technical Dept. for precautionary steps:
  - 1. The roof assembly permits interior air to pressurize the membrane underside.
  - 2. Any exterior wall has 10 percent or more of the surface area comprised of opening doors or windows.
  - 3. The wall/deck intersection permits air entry into the wall flashing area.
- V. Precautions shall be taken when using Sarnacol adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.
- W. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.
- X. Sarnafil membranes are slippery when wet or covered with snow, frost, or ice. Working on surfaces under these conditions is hazardous. Appropriate safety measures must be implemented prior to working on such surfaces. Always follow OSHA and other relevant fall protection standards when working on roofs.

## **1.07 BIDDING REQUIREMENTS**

- A. Pre-Bid Meeting:

See County Invitation To Bid

- B. Site Visit:

Bidders shall visit the site and carefully examine the areas in question as to conditions that may affect proper execution of the work. All dimensions and quantities shall be determined or verified by the Applicator. No claims for extra costs will be allowed because of lack of full knowledge of the existing conditions unless agreed to in advance with the Owner or Owner's Representative.

## **1.08 WARRANTIES**

- A. Sika Sarnafil Membrane Warranty

Upon successful completion of the work to Sika Sarnafil's satisfaction and receipt of final payment, the

Sika Sarnafil Membrane Warranty shall be issued.

- B. Sika Sarnafil System Warranty (only products purchased from Sika Sarnafil are covered under System Warranty)

Upon successful completion of the work to Sika Sarnafil's satisfaction and receipt of final payment, the Sika Sarnafil System Warranty shall be issued.

- C. Applicator/Roofing Contractor Warranty

Applicator shall supply Owner with a separate workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Applicator warranty term, defective or otherwise not in accordance with Contract Documents, the Applicator shall repair that defect at no cost to Owner. Applicator's warranty obligation shall run directly to Owner, and a copy shall be sent to Sika Sarnafil.

- D. Owner Responsibility

Owner shall notify both Sika Sarnafil and the Applicator of any leaks as they occur during the time period when both warranties are in effect.

### **1.09 WARRANTY DURATIONS**

- A. Sika Sarnafil's warranty shall be in effect for 30 year duration.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

- B. Components of the roof system are to be products of Sika Sarnafil as indicated on the Detail Drawings and specified in the Contract Documents.
- C. Components to be used that are other than those supplied or manufactured by Sika Sarnafil may be submitted for review and acceptance by Sika Sarnafil. Sika Sarnafil's acceptance of any other product is only for a determination of compatibility with Sika Sarnafil products and not for inclusion in the Sika Sarnafil warranty. The specifications, installation instructions, limitations, and restrictions of the respective manufacturers must be reviewed by the Owner's Representative for acceptability for the intended use with Sika Sarnafil products.
- D. Special consideration should be given to construction related moisture. An example is the significant amount of moisture generated when concrete floor slabs are poured after the roof has been installed. Sika Sarnafil is not responsible for damage to the insulation when exposed to construction related moisture.

### **2.02 MEMBRANE**

- A. Membrane shall conform to:
1. ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type III.
  2. NSF/ANSI Standard 347, "Sustainability Assessment for Single Ply Roofing Membranes". Certification Level: Platinum.
- B. Sarnafil S327 thermoplastic membrane with polyester reinforcement and lacquer coating.
- C. Thickness (Pick one)
1. Sarnafil S327-15, 80 mil (1.5 mm)

## D. Color of Membrane

1. EnergySmart White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 (ENERGY STAR listed).

E. Typical Physical Properties <sup>(1)</sup>

<u>Parameters</u>	<u>ASTM Test Method</u>	<u>ASTM D-4434 Spec. Requirement</u>	<u>Typical Physical Properties</u>
Reinforcing Material	-	-	Polyester
Overall Thickness(1), min., inches (mm)	D751	0.045 (1.14)	[0.0__inches]
Thickness Above Scrim	-	-	0.023 (avg.)
Breaking Strength, min., lbf/in. (KN/m)	D751	200 (35.0)	230 (40.0)
Elongation at Break, min. (machine / transverse)	D751	15% / 15%	25% / 25%
Seam strength(2), min. (% of breaking strength)	D751	75	85
Retention of Properties After Heat Aging	D3045	-	-
Tensile Strength, min., (% of original)	D751	90	95
Elongation, min., (% of original)	D751	90	90
Tearing Resistance, min., lbf (N)	D1004	45 (200)	45.0 (200)
Low Temperature Bend, -40° F (-40° C)	D2136	Pass	Pass
Accelerated Weathering Test (florescent light, uv exposure)	G154	5,000 Hours	10,000 Hours
Cracking (7x magnification)	-	None	None
Discoloration (by observation)	-	Negligible	Negligible
Crazing (7x magnification)	-	None	None
Linear Dimensional Change	D1204	0.5 % max.	0.1%
Weight Change After Immersion in Water	D570	± 3.0% max.	2.5%
Static Puncture Resistance, 33 lbf (15 kg)	D5602	Pass	Pass
Dynamic Puncture Resistance, 14.7 ft-lbf (20 J)	D5635	Pass	Pass
Initial Solar Reflectance	E903	-	0.83
Emissivity	E408, C1371, Other	-	0.90
Solar Reflective Index (SRI)	E1980	-	104
Recycled Content (5 & 10 ft. sheets only)	9% Pre-Consumer / 1% Post Consumer		

## Notes

(1) Typical Physical Properties data is applicable for 0.048 in (1.2 mm) membrane thickness and greater.

(2) Failure occurs through membrane rupture not seam failure.

Physical Properties shown are prior to applying felt backing, if specified.

**2.03 FLASHING MATERIALS**

## A. Wall / Curb Flashing

## 1. G410 Flashing Membrane

A fiberglass reinforced membrane adhered to approved substrates using Sarnacol adhesive. G410 comes in 8" and 12" widths and is (1.5 mm) thick. Consult Product Data Sheets for adhesive options and additional information.

## 2. Sarnafil S327 Membrane

A polyester reinforced membrane used for mechanically-attached flashings to approved substrate using Sarnadisc or Sarnabar. Consult Product Data Sheet for adhesive rates and additional information.

## 3. Sarnaclad

A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 24 gauge, G90 galvanized metal sheet with a 20 mil (0.5 mm) unsupported Sarnafil membrane laminated on one side. The dimensions of Sarnaclad are 4 ft x 8 ft (1.2 m x 2.4 m) or 4 ft x 10 ft (1.2 m x 3.0 m). Consult Product Data Sheet for additional information.

## B. Perimeter Edge Flashing

### 1. Edge Grip Fascia

A prefabricated perimeter edge system provided by Sika Sarnafil. The system has concealed fasteners with no penetrations on the horizontal roof surface and includes fasteners and splice plates. Edge Grip is made from two distinct parts. A rigid retainer base plate and a decorative snap-on fascia cover. The retainer is made from 20 gauge galvanized steel in 10 foot (3048 mm) standard lengths and is provided with 9/32 inch (7 mm) slotted pre-punched holes for fastener spacing at 12 inches (152 mm) on center. As an option the retainer base plate is also available in 0.05 inch (1.3 mm) aluminum. The snap-on fascia cover is available in 10 foot (3048 mm) lengths and in a variety of thickness, colors, finishes, and widths. Kynar-500 colors are available for galvanized steel and natural mill finished aluminum. Clear and anodized colors are available for anodized finished aluminum. Matching corners, end caps, fascia sumps, spillouts, etc. are available as accessories. Consult Product Data Sheet for additional information.

- a) Retainer base plate shall be 20 gauge galvanized steel in 10 ft. lengths.
- b) Snap-on fascia cover shall be 24 gauge galvanized steel in 10 ft. lengths.
- c) Snap-on fascia cover shall have a Kynar finish.
- d) Snap-on fascia cover color shall be \_\_\_\_\_.

### 2. Sarnaclad

A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 24 gauge, G90 galvanized metal sheet with a 20 mil (0.5 mm) unsupported Sarnafil membrane laminated on one side. The dimensions of Sarnaclad are 4 ft x 8 ft (1.2 m x 2.4 m) or 4 ft x 10 ft (1.2 m x 3.0 m). Consult Product Data Sheet for additional information.

### 3. Non-Typical Edge

Project-specific perimeter edge detail reviewed and accepted for one-time use by Sika Sarnafil's Technical Department. Consult Regional Technical Manager prior to job start for review and consideration for acceptance.

## C. Miscellaneous Flashing

### 1. Sarnareglet

A heavy-duty, extruded aluminum flashing termination reglet used at walls and large curbs. Sarnareglet is produced from 6063-T5, 0.10 inch to 0.12 inch (2.5 mm to 3.0 mm) thick extruded aluminum. Sarnareglet has a 2-1/4 inch (57 mm) deep profile, and is provided in 10 foot (3 m) lengths. Use prefabricated Sarnareglet mitered inside and outside corners where walls intersect. Consult Product Data Sheet for additional information.

### 2. Sarnastack Universal

A 60 mil (1.5 mm) thick prefabricated stack/pipe boot injection molded. Consult Product Data Sheet for additional information.

### 3. Sarnadrain-RAC

PVC-coated, heavy-duty aluminum roof drain insert that mechanically seals to the drainpipe interior. Sarnadrain-RAC is made of 0.080 inch (2 mm) thick 6063 aluminum with a urethane seal installed at the end of the drainpipe. The large 14 inch x 14 inch (0.36 m x 0.36 m) drain strainer is also made of 0.080 inch (2 mm) thick aluminum stock. The flange dimensions of Sarnadrain-RAC are 18 inches x 18 inches (0.46 m x 0.46 m). Consult Product Data Sheet for sizes and additional information.

**4. Sarnacircles**

A 60 mil (1.5mm) thick prefabricated 4 1/2 in. round circle patch injection molded. Consult Product Data Sheet for additional information.

**5. Sarnacorners - Inside**

A 60 mil (1.5 mm) thick prefabricated inside corner injection molded. Consult Product Data Sheet for additional information.

**6. Sarnacorners - Outside**

A 60 mil (1.5 mm) thick prefabricated outside corner injection molded. Consult Product Data Sheet for additional information.

**7. Open Post Flashing**

A 48 mil (1.2 mm) thick prefabricated flashing using weld technology convenient to flash obstructed rooftop conduits and pipes. Open post flashings are fabricated with an open seam and are available in different sizes. Consult Product Data Sheet for sizes and additional information.

**8. Sikaflex-1a**

A proprietary sealant used at wall, curb drain terminations, pipe penetrations, and under certain metals. It can also be used as a pitch pocket sealant. Consult Product Data Sheet for additional information.

**9. Sarnafiller**

A pourable two component urethane sealant used as a pitch pocket filler for roofing applications. Consult Product Data Sheet for additional information.

**Notes:**

- a) When Sarnafelt is used as a leveling and/or separating layer a 2<sup>nd</sup> coat on the dried substrate at the same rate is required to adhere the felt and then the membrane.

**10. Sarnafelt**

A leveling and/or separation layer that is necessary behind G410 or G459 Flashing Membrane when the flashing substrates are rough or incompatible with the flashing membrane. Consult Product Data Sheets for additional information.

**11. S327 Coverstrip**

8 inch (0.20 m) wide precut flashing made from Sarnafil S327 polyester reinforced membrane. Used to coverstrip Sarnabar and Sarnadisc.

**2.04 INSULATION / ROOF BOARD****A. Sarnatherm Insulation Coated Glass Facer**

A 20 PSI rigid polyisocyanurate insulation board with a coated polymer bonded glass fiber mat facer. 2.5" thickness (same as existing) various sizes for replacement of damaged existing ISO.

**B. DensDeck Cover Board**

Employs enhanced fiberglass mats front and back that are bonded to a high density gypsum core. Use 1/2" x 4' x 8 boards.

## 2.05 ATTACHMENT COMPONENTS

### A. Sarnadisc RhinoBond

A high strength plate with a polymer coating used with various Sarnafasteners to attach insulation boards to the roof deck and as a substrate to induction weld S327 membrane, Sarnadisc RhinoBond is a 3 inch (75 mm) round, 22 gauge corrosion resistant steel plate. Consult Product Data Sheet for additional information.

### B. Sarnafastener-HD

A #14 corrosion-resistant fastener used to attach to structural concrete or wood roof decks, Sarnafastener-HD has a shank diameter of 0.190 inch (4.8 mm), a thread diameter of 0.245 inch (6.2 mm) and a #3 Phillips drive head with a diameter of 0.435 inch (11 mm). Consult Product Data Sheet for additional information.

## 2.06 WALKWAY PROTECTION ( Choose one)

### A. SarnaTred V

A polyester reinforced, 0.096 inch (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 (1.0 m) wide and 32.8 feet (10 m) long. Consult Product Data Sheet for additional information.

## 2.01 MISCELLANEOUS ACCESSORIES

### A. RhinoBond Induction Welder

A 110 volt induction welding device that creates a radio frequency that allows the membrane to be welded to a specially coated plate.

### B. Aluminum Tape

A 2 inch (50 mm) wide pressure-sensitive aluminum tape used as a separation layer between small areas of asphalt contamination and the membrane and as a bond-breaker under the coverstrip at Sarnaclad joints.

### C. Multi-Purpose Tape

A high performance sealant tape used with metal flashings as a preventive measure against air and wind blown moisture entry.

## 2.02 SEALANTS AND PITCH POCKET FILLERS

A. Sikaflex-1a Sealant (for termination details and pitch pocket toppings).

B. Sarnafiller (two-component urethane adhesive for pitch pocket toppings).

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

1. Type III hot asphalt conforming to ASTM D312 (latest version).
2. Sarnafiller.
3. Multiple layers of roofing cement and felt.
4. Spray-applied, water-resistant urethane foam.
5. Mechanical attachment with rigid bars and compressed sealant.

### 2.03 MISCELLANEOUS FASTENERS AND ANCHORS

All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins. All concrete fasteners and anchors shall have a minimum embedment of 1-1/4 inch (32 mm) and shall be approved for such use by the fastener manufacturer. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch (25 mm) and shall be approved for such use by the fastener manufacturer.

## PART 2 - EXECUTION

### 3.01 PRE-CONSTRUCTION CONFERENCE

- A. The Applicator, Owner's Representative/Designer and Manufacturer(s) shall attend a pre-construction conference.
- 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

### 3.02 SUBSTRATE CONDITION

- A. Applicator and Owner 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, gutters and scuppers have been reconditioned or replaced and installed properly.
  2. Roof curbs, nailers, 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, ice and snow.

### 3.03 SUBSTRATE PREPERATION

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 as to eliminate risk of deck overload due to concentrated weight. The Owner's 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.

- A. Reroofing with Removal of Existing Single-Ply Roofing

General Criteria:

The Owner's Representative and Applicator shall determine the condition of the roof deck and existing insulation. Deteriorated decking or wet or deteriorated materials are to be removed and replaced. After removal of single-ply roof, inspect insulation boards and reuse only if dry and in stable condition. Add a



Sika Sarnafil approved cover board. Fasten recover board or top layer of insulation in accordance with Sika Sarnafil's requirements.

### 3.04 SUBSTRATE INSPECTION

- A. A dry, clean and smooth substrate shall be prepared to receive the Sika Sarnafil Sarnafast mechanically-attached 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, ice and snow.
- E. Sika Sarnafil shall be applied over compatible or acceptable substrates only.

### 3.05 OVERLAYMENT BOARD INSTALLATION

- A. General Criteria:
  - 1. Boards shall be installed according to manufacturer's instructions.
  - 2. Boards shall be neatly cut to fit around penetrations and projections.
  - 3. Do not install more boards than can be covered with Sarnafil membrane by end of day or onset of inclement weather.
  - 4. Boards shall be installed tightly against adjacent boards on all sides.
  - 5. Boards shall evenly on roof deck/substrate so that there are no significant and avoidable air spaces between boards and substrate.
- B. Mechanical Attachment of Overlayment Board
  - 1. Overlayment board shall be mechanically fastened to deck with approved fasteners and plates at a rate according to overlayment board manufacturer's, FM's and Sika Sarnafil's recommendations for fastening rates and patterns.
  - 2. Fasten overlayment board per layout indicated on detail drawing. Fasteners must be tight enough so insulation plates do not turn, but not so tight as to deform them.
  - 3. Fasteners shall be installed consistently in accordance with fastener manufacturer's recommendations.
- C. Perimeter and Corner Areas

Perimeter and corner areas will be determined by building height and width and other conditions according to ASCE 7 guidelines, Sika Sarnafil Technical, or FM LPDS 1-29 if insured by Factory Mutual. To meet perimeter and corner uplift requirements, increase fastener density by decreasing spacing between fastener points in one or both directions. Total tributary area to each fastener is no more than 60 percent for perimeter and 40 percent for corners, based on field of roof fastening density. See Detail Drawings.

#### Notes:

- a) Perimeter area is defined as the outer boundary of the roof. If the roof is broken into different levels, each roof area shall be treated as an individual roof with its outer boundary being treated as a perimeter. Typically, internal expansion joints and firewalls are not considered to be full perimeters. Refer to Factory Mutual's Data Sheet 1-28 for more information.
- b) The ridge area is defined as the high point in the roof area formed by two intersecting planes. When the sum of the slopes is a minimum of 4 inches in 12 inches (30 degrees), each side of the ridge shall be treated as a perimeter area.

### 3.06 INSTALLATION OF SARNAFIL MEMBRANE

The surface of the insulation or substrate shall be inspected prior to installation of the Sarnafil roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged insulation boards shall be removed and replaced. Sarnafil S327 membrane shall be attached with Sarnafasteners and Sarnadisc RhinoBond according to Sika Sarnafil's and wind uplift requirements per ASCE 7 or Factory Mutual.

A. RhinoBond - Membrane Attachment to Structural Deck (Documented Pullout Tests Required)

1. General

- a) Sarnafil S327 full width rolls shall be placed over the installed boards. Membrane overlaps shall be shingled with the flow of water where possible. Seam overlaps may be placed over Sarnadisc RhinoBond plate. Welding of the plate will not be affected.
- b) **Tack welding of the membrane for purposes of temporary restraint during installation is not permitted and may result in voiding of Sika Sarnafil warranty.** Consult Sika Sarnafil's Technical Department for further information.

2. Field, Perimeter and Corner Areas

Over the properly prepared, installed and attached substrate surface following either the 2 by 2 foot (0.6 by 0.6 m) or 2 by 3 foot (0.6 by 0.9 m) grid pattern, S327 full-width rolls are to be installed so as to properly shed water. See Detail Drawings for fastener layouts. Refer to FM LPDS 1-29 for their requirements for perimeter and corner enhancements.

3. Securement Around Rooftop Penetrations

- a) Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations, Sarnafasteners and Sarnadisc RhinoBond, Sarnadiscs or Sarnabars shall be installed according to perimeter rate of attachment. Fasteners shall be installed according to the manufacturer's instructions. Fasteners shall be installed using the fastener manufacturer's recommended torque-sensitive fastening tools with depth locators. If Sarnadisc RhinoBond is not used, the fasteners shall clamp the Sarnafil membrane tightly to the substrate.
- a) Sarnafil membrane flashings shall extend 2-1/2 inches (63 mm) past Sarnadisc and be hot-air welded to the Sarnafil deck membrane.

### 3.07 RHINO BOND INDUCTION WELDING

A. General

1. Welding equipment shall be provided by or approved by Sika Sarnafil. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Sika Sarnafil Technical Service Representative prior to welding.
2. All membrane to be welded shall be clean and dry.

B. Induction Welding

1. Activate the weld between membrane and plate using approved portable induction device. The induction coil must be positioned over the center of the Sarnadisc RhinoBond, +/- 1 inch (25 mm) Portable induction device must elevate the temperature of the Sarnadisc RhinoBond from ambient to 400 – 500 degree F (204 – 260 degree C). Cycle time will be affected by available power, use a heavy gauge power cord, at a minimum 12 gauge by 100 feet.
2. When the induction welding cycle is complete, immediately place a Cool & Clamp magnetic weight on the welded assembly. This device must be left in place for at least 60 seconds.

C. Quality Control of Induction Welding

1. The Applicator shall check all induction welds each day. Check welds by using an ordinary plunger centered over the welded plate and pull straight up. Correct welds shall have no separation between the plate and membrane.

### **3.08 HOT-AIR WELDING OF SEAM OVERLAPS**

#### **A. General**

1. All seams shall be hot-air welded. Seam overlaps should be 3 inches (76 mm) wide for the RhinoBond System and 4 inches (100 mm) wide when hand-welding, except for certain details.
2. Welding equipment shall be provided by or approved by Sika Sarnafil. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Sika Sarnafil Technical Service Representative prior to welding.
3. All membrane to be welded shall be clean and dry.

#### **B. Hand-Welding**

Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.

1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
2. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow", the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch (20 mm) wide nozzle shall be used.

#### **C. Machine Welding**

1. Machine welded seams are achieved by the use of Sika Sarnafil's automatic welding equipment. When using this equipment, Sika Sarnafil's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated simultaneously off the generator.
2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

#### **D. Quality Control of Welded Seams**

1. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark gray material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator at locations as directed by the Owner's Representative or Sika Sarnafil's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

### **3.09 MEMBRANE FLASHINGS**

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sika Sarnafil. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use

caution to ensure adhesive fumes are not drawn into the building.

- A. Sarnacol Adhesive for Membrane Flashings
1. Over the properly installed and prepared flashing substrate, Sarnacol adhesive shall be applied according to instructions found on the Product Data Sheet. The Sarnacol adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
  2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.
- B. Install Sarnabar/Sarnacord according to the Detail Drawings with approved fasteners into the structural deck at the base of parapets, walls and curbs. Sarnabars may be required by Sika Sarnafil at the base of all tapered edge strips and at transitions, peaks, and valleys according to Sika Sarnafil's details.
- C. Sika Sarnafil's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by Sika Sarnafil prior to installation.
- D. All flashings should extend a minimum of 8 inches (0.2 m) above roofing level, exceptions to this might be pipe boots and/or sealant pockets, etc. If in question, submit in writing to the Owner's Representative and Sika Sarnafil Technical Department for signed approval.
- E. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the Sarnafil membrane.
- F. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Sarnastop at 6-8 inches (0.15-0.20 m) on center.
- G. Sarnafil flashings shall be terminated according to Sika Sarnafil recommended details.
- H. All adhered flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult Sika Sarnafil Technical Department for securement methods.

### 3.10 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, other than that provided by Sika Sarnafil, is not covered under the Sika Sarnafil warranty.
- C. Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.
- D. Metal shall be installed to provide adequate resistance to bending to allow for normal thermal expansion and contraction.
- E. Metal joints shall be watertight.
- F. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 inch (25 mm).
- G. Counter flashings shall overlap base flashings at least 4 inches (100 mm).
- H. Hook strips shall extend past wood nailers over wall surfaces by 1-1/2 inch (38 mm) minimum and shall

be securely sealed from air entry.

### 3.11 SARNACLAD METAL BASE FLASHINGS/EDGE METAL

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sika Sarnafil. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

A. Sarnaclad metal flashings shall be formed and installed per the Detail Drawings.

1. All metal flashings shall be fastened into solid wood nailers with two rows of post galvanized flat head annular ring nails, 4 inches (100 mm) on center staggered. Fasteners shall penetrate the nailer a minimum of 1 inch (25 mm).
2. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

B. Adjacent sheets of Sarnaclad shall be spaced 1/4 inch (6 mm) apart. The joint shall be covered with 2 inch (50 mm) wide aluminum tape. A 4 inch minimum (100 mm) wide strip of Sarnafil flashing membrane shall be hot-air welded over the joint.

### 3.12 EDGE METAL

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sika Sarnafil. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

A. Edge Grip Fascia

1. Position the roof membrane over edge of roof and down outside face of wall covering wood nailer(s) completely. Allow 1/2 inch (13 mm) of excess membrane to extend down past the wood nailer. Hot-air weld all seams making sure there are no voids in welds.
2. Apply a 3/8 inch (10 mm) continuous bead of Sikaflex – 1a sealant to the clean bottom of formed retainer. Install formed retainer from right to left as seen from rooftop. Overlap joints of straight run sections a minimum of 1 inch (25 mm) and corner sections a minimum of 5 inches (127 mm). Field cut sections as necessary.
3. Fasten formed retainer into side of nailer 12 inches (0.3 m) on center. Use fasteners provided with Edge Grip system; 1-1/2 inch (38 mm) hex head stainless steel fasteners with neoprene washers.
4. Fasteners shall provide a minimum 240 lbs. (109 kg) pull-out resistance; suitable for the substrates to which being installed.
5. Install concealed joint splice plates intersecting sections of snap-on fascia cover joints.
6. Position snap-on fascia cover so that it's top engages the formed retainer top. Rotate downward engaging bottoms of snap-on fascia cover and formed retainer. Allow 1/4 inch (6 mm) gap between snap-on fascia sections for thermal expansion. Field cut where necessary.

### 3.13 WALKWAY INSTALLATION

A. SarnaTred V Walkway

Roofing membrane to receive SarnaTred V Walkway shall be clean and dry. Place chalk lines on deck

sheet to indicate location of SarnaTred. Apply a continuous coat of Sta-Bond U148A adhesive to the deck sheet and the back of SarnaTred in accordance with Sika Sarnafil's technical requirements and press Sarnatred into place with a minimum 100 lb (45 kg) steel, membrane roller, by rolling in two directions. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the Sarnatred to the Sarnafil deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies. **Important:** Check all existing deck membrane seams that are to be covered by Sarnatred with rounded screwdriver and reweld any inconsistencies before Sarnatred installation. Do not run Sarnatred over Sarnabars.

### **3.14 TEMPORARY CUT-OFF**

All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. All temporary waterstops shall be constructed to provide a 100 percent watertight seal. The stagger of the insulation joints shall be made even by installing partial panels of insulation. The new membrane shall be carried into the waterstop. Waterstop shall be sealed to the deck and substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of sealant as described in Section 2.02. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and properly disposed of off-site. None of these materials shall be used in the new work.

If inclement weather occurs while a temporary waterstop is in place, the Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.

If any water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

### **3.15 COMPLETION**

Prior to demobilization from the site, the work shall be reviewed by the Owner's Representative and the Applicator. All defects noted and non-compliances with the Specifications or the recommendations of Sika Sarnafil shall be itemized in a punch list. These items must be corrected immediately by the Applicator to the satisfaction of the Owner's Representative and Sika Sarnafil prior to demobilization.

All Warranties referenced in this Specification shall have been submitted and have been accepted at time of contract award.

### **3.16 DETAILS**

Refer to the Sika Sarnafil Typical System Details section for additional details.