

## SECTION 07526

### **MODIFIED BITUMEN SHEET ROOFING**

(For Concrete Decks / Assembly # 1-RC)

#### **PART 1 - GENERAL**

##### 1.01 SUMMARY

- A. Modified Bitumen Sheet Roofing
- B. Modified Bitumen Flashings
- C. Roof Accessories
- D. Walkways
- E. Surfacing

##### 1.02 RELATED SECTIONS

- A. Division 6 Section Carpentry: Wood Nailers.
- B. Division 7 Section Flashing and Sheet Metal: Metal Counter Flashings.
- C. Division 7 Section Roof Specialties: Roof Hatches, Prefabricated Curbs.
- D. Division 7 Section Sealants: Caulks, Sealants.
- E. Division 15 Section Drainage and Vent Systems: Roof Drains.

##### 1.03 REFERENCES

- A. ASTM-American Society for Testing and Material
- B. AWPB-American Wood Preservers' Bureau
- C. ASTM D41-Asphalt Primer Used in Roofing
- D. NRCA-National Roofing Contractors Association
- E. ASTM D2178-Asphalt Glass Felt Used in Roofing
- F. ASTM D312-Asphalt Used in Roofing
- G. UL-Underwriters Laboratories, Fire Classification
- H. SMACNA-Sheet Metal and Air Conditioning Contractors National Association
- I. ASTM D1227-Asphalt Emulsion as a Roof Coating
- J. ASTM D1863-Mineral Aggregate
- K. ASTM D2824-Aluminum Pigmented Asphalt Roof Coating

##### 1.04 REGULATORY REQUIREMENTS

- A. UL Classification: Class A
- B. Factory Mutual (FM) System Classification: 1-705
- C. Additional Test Agencies & Building Code Requirements: As applies

##### 1.05 SUBMITTALS

- A. Submit product data for: All components to be used, *i.e.*: Primer, Membranes, Coatings, *et al*
- B. When materials are specified or a particular make or trade name is specified, it shall be indicative of a standard required. Bidder proposing substitutes shall submit the following:
  - 1. Written application with explanation of why it should be considered.
  - 2. Accredited testing laboratory certificate comparing substitute's physical/performance attributes to those specified.

3. Smallest standard package of adhesive, coating, mastic, sealant, ply sheet, fastener(s) and flashing materials.
  4. Three job references available for inspection where substitutes were used under similar conditions.
- C. Only substitutions approved in writing by Owner prior to scheduled installation will be considered.

#### 1.06 QUALITY ASSURANCE

##### A. Manufacturer

1. Shall provide local Technical Sales Representative to make start-up inspection and in-progress site inspections at regular intervals.
2. Shall provide final inspection of completed roofing system and issuance of the warranty.

##### B. Contractor

1. Roofing contractor shall be a registered applicator by the Manufacturer.
2. Contractor shall retain a workmanship warranty for the specified system within the manufacturer's warranty.
3. Strict adherence to the manufacturer's most current published specifications are to be followed. Deviations must be approved in writing by the architect and manufacturer prior to installation.

##### C. Designation of Responsible Personnel

##### D. Walkover Inspection

1. Attendance: Representative of Owner/Architect, General Contractor, Roofing Contractor and Manufacturer's Technical Representative.

##### E. Final Inspection

1. Will be scheduled by roofing contractor upon job completion.
2. Attendance: Representative of Owner/Architect, General Contractor, Roofing Contractor and Membrane Manufacturer's Technical Representative.
3. Minimum agenda:
  - a) Walkover inspection.
  - b) Identification of problems which may impede issuance of warranty.
  - c) Creation of punch list.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

##### A. Delivery of Materials.

1. Deliver and store materials under provisions of Section 01600.

2. Deliver materials to job-site in new, dry, unopened and well marked containers showing product and manufacturer's name, production date and/or product code. All materials delivered shall be on pallets.
3. Deliver materials in sufficient quantity to allow continuity of work.

**B. Storage of Materials.**

1. Storage of plies to be protected from water or extreme humidity.
2. Store all roll roof materials on end to prevent their becoming deformed/damaged. Discard rolls which have flattened, creased or otherwise damaged.
3. Place materials on pallets which are at least four (4) inches above the ground. Do not stack pallets.
4. Rooftop Storage: Disperse materials to avoid concentrated loading.
5. Cover top and sides of all exterior stored materials with canvas tarpaulin (not polyethylene). Secure tarpaulin.

**C. Material Handling.**

1. Handle plies to avoid bending, tearing or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in location(s) that will hinder smooth flow of vehicular or pedestrian traffic.

**D. Safety Requirements.**

1. All application, material handling and associated equipment shall conform to and be in conformance with OSHA safety requirements.
2. Comply with Federal, State, Local and Owner fire safety requirements.
3. Maintain fire extinguishers within easy access whenever power tools, kettles or torches are being used.

## 1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply roofing membrane during inclement weather.
- B. Do not apply roofing membrane to damp or frozen substrates.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

## 1.09 WARRANTY

- A. Manufacturer shall provide:

10 years Material Only

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

A. *Danosa Caribbean, Inc. (www.danosapr.com), Lot 29, C Street, Luchetti Industrial Complex Bayamon, PR 00961*

B. Approved Substitutions.

### 2.02 SHEET MATERIALS

A. Modified Bitumen Base Sheet: **Glasdan R-36**. SBS Modified Bitumen Membrane base membrane with a fiberglass mat reinforcement, protected with a burn-off film and or silica sand on either side. 3 mm. ASTM-D-6163-98 Type I Grade S

B. Modified Bitumen Membrane: **Glasdan RM-4**. SBS Modified Bitumen top membrane with a fiberglass mat reinforcement, finished with ceramic granule as top protection surface area and burn-off film or silica sand on the other side. ASTM-D-6163-98 Type I Grade G 3.6 mm

C. Flashing Membrane: **Glasdan AL-80-4**. (SBS) Modified Bitumen flashing membrane with a fiberglass mat reinforcement, finished with aluminum clad top protection surface area and burn-off film on the other side. ASTM-D-6298-98 3.6 mm

### 2.03 BITUMINOUS MATERIAL

- A. Asphalt Primer: ASTM D41, Danosa Primer.
- B. Elastomeric Adhesive: ASTM D3019, Richport Modified Cold Adhesive.
- C. Elastomeric Mastic: ASTM D4586, Richport Cold Flash Adhesive.
- D. Aluminum Coating: ASTM D2824, Richport Aluminum Roof Coating.
- E. Asphalt Emulsion: ASTM D1227, Richport Modified Asphalt Emulsion.

### 2.04 RELATED MATERIALS

- A. Sealant: One part urethane.
- B. Cants: Perlite, ASTM C 728, 4" face.
- C. Prefabricated Roof Hatches
- D. Traffic Surfacing: DAN-O-PAD by Danosa Caribbean, Inc.
- E. Lead boots and flashing; ASTM B-29, 4 lb. per square foot.
- F. Roof Penetrations protection: Chem-Curb by Danosa Caribbean, Inc.
- G. Grease Containment: Grease Guard by Danosa Caribbean, Inc.

## PART 3 - EXECUTION

### 3.01 EXAMINATION AND PROTECTION

#### A. Inspection

1. Verify installation conditions as satisfactory to receive work.
2. Do not install new roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.
3. Check projections, curbs and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality of execution of the new roofing system.

#### B. General Workmanship

1. Substrate: Free of foreign particles prior to laying roof membrane.
2. Phased application: Not permitted, all plies shall be completed each day.
3. Confine equipment, storage of materials, debris and the operations and movement of workers within the limits agreed upon for the project.
4. Where wheeled or other traffic over partially completed roofing is unavoidable, provide adequate exterior protection to the roof.
5. Wrapper and package materials: Not to be included in roof system.
6. All metal and masonry shall be asphalt primed before fully adhering flashing sheets.
7. Mechanical Fasteners: Seated firmly with fastener heads flush or below surface.
8. Base flashing height is not less than eight (8) inches above finished surface.

#### C. Protection

1. Contractor shall be responsible for protection of property during course of work. Lawn, shrubbery, paved areas and building shall be protected from damage at no extra cost.
2. Roofing and flashing shall be installed and sealed in a watertight manner on same day of installation or upon the arrival of inclement weather.
3. At the end of each work day, partial installation shall be sealed with water stops along edges to prevent water entry.
4. At the start of each work day, drains within daily work area shall be plugged. Plugs are to be removed at end of each work day or before arrival of inclement weather.
5. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day or before arrival of inclement weather.
6. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface and equipment movement. Move equipment and ground storage areas as work progresses.

#### D. Surface Preparation

1. Remove all existing roof membrane, insulation and flashings down to the deck and curbs.
2. Verify structural integrity of the deck. Notify the Architect of any deck or curb deficiency.

3. Remove deteriorated or damaged wood blocking and install new treated wood blocking to match existing. See detail drawings.

### 3.02 ROOF MEMBRANE APPLICATION

Substrate must be suitable to receive and hold roof system materials.

Prime all deck surfaces with asphalt primer at 1 gallon per 100 to 200 square feet and allow to dry.

Starting at the low point, install modified bitumen membrane by **Torch**.

#### A. *Work Area Preparation:*

1. Adequate ventilation is required; enough ventilation such that personnel exposures to hazardous concentration of airborne contaminants are maintained at or below the allowable levels specified by OSHA or NIOSH.
  - a. Special care should be taken when torch welding is done in close or confined spaces due to possible concentration of contaminants and potential oxygen depletion. Appropriate precautions shall be observed. Use of mechanical ventilation to force air movement or use of approved respirators may be required.
2. All roof openings and edges should be protected or guarded in conformity with OSHA standards.
3. In awareness of other personnel in the torch welding area is mandatory, in tight quarters; only one (1) torch should be used.
4. The installer needs to have previously noted the locations of all pipes, curbs, or other roof top projections before working with torch welding.
5. Removal of combustible debris from the application area before the torch welding application begins is mandatory.
6. Appropriate precautions should be taken when torch welding in the proximity of gas pipe joints, HVAC coupling joints, or electrical service lines.
7. A base roofing ply shall cover all flammable materials (e.g. wood walls and wood fiber cant) before the torch welding application begins.
8. No torch welding shall be done unless the surrounding atmosphere is nonflammable and unless combustibles are moved away or properly protected from fire hazards.
9. Combustible materials which are present on a roof. Such as material wrappers, solvents, primers and roof cements shall be moved to a designated safe location.
10. Combustible materials which are present on a roof and are not movable shall be protected from fire hazards.
11. Combustible materials present on adjoining building surfaces (e.g. Shake shingles or wood siding) should be protected by covering with fire retardant blankets or a protective shield.
12. Sufficient fire extinguishing equipment shall be ready for use where torch welding roof work is being done. The fire extinguishing

equipment should be portable fire extinguishers (Type ABC). In addition, buckets of sand and pails of water are advisable. Portable fire extinguishers shall be of the size and type required by local codes. A minimum of one 20 lbs. fire extinguisher per torch or torching machine should be on the roof at all times at the torching location. Special care shall be taken to check all fire extinguishers prior to and at the completion of the day's work to make sure they are full and operable.

**B. Application:**

1. Start at the low point of the roof and progress to the high point. The membrane shall be installed perpendicular to the slope of the roof except when the slope exceeds 3" per foot. At vertical surfaces, abutting the roof, the membrane shall extend to the cant and must be heat welded to the underlying membrane previously installed.
  - a. On slopes of more than three inches per foot, the seams should run parallel to the slope of the roof.
2. All overlaps at the membrane seam shall be installed so as to have "up" slope laps over "down" slope laps.
3. Danosa membranes shall never be applied by any method except with a propane torch or electric heat welding devices designed for application modified bitumen.
  - a. Flammable and solvent-based material (e.g. plastic cement) should not be exposed to flame.
  - b. When re-roofing, wood and fiber cant strips are extremely flammable and should be removed or protected.
  - c. Restaurant and food service exhaust vents can contain grease (*Grease Guard* grease containment system is recommended for these areas). All intake fans should be shut off during application with special care taken to keep torches away from openings. Exhaust vents for laundromats in condominiums, apartments and other multiple tenant dwellings can contain lint and debris. Open flames should be kept clear of all vents.
4. Membranes must not be applied during adverse weather or without precautionary measures in temperatures below 40° F.
5. The coiled membrane shall be unrolled approximately 15 feet, aligned, then the propane torch flame applied to the exposed outer surface of the coiled membrane until the bitumen reaches the proper application temperature, causing to develop a slight sheen. Care should be taken to avoid overheating which may result in damage to or improper adhesion of the membrane. The flame should be moved from side to side and up the lap edge while the membrane is slowly unrolled and adhered to the underlying surface. Subsequent shift of the roll shall be avoided after heating has begun. When complete, the remaining membrane shall be re-rolled and installed in the same manner. All end laps must be staggered so that no adjacent end laps coincide.

6. The end laps shall be lapped six inches (6"), and the side laps must be lapped four inches (4") A bitumen bleed-out approximately ¼" to ½" must be obtained at all seam areas.
  - a. To ensure the proper ½" flow of bitumen at the seam areas, a roller may be used. The man using roller should follow behind the torch man no more than 4 feet nor less than 3 feet to be sure that membrane will be in condition to produce proper bleed-out.
7. The seam can be rolled with a hand roller or troweled with heated trowel. When one end is complete, re-roll the opposite end not yet torched, and install in the same manner.
8. All end laps should be staggered a minimum of 15 feet.
9. All LP-Gas cylinders shall be secured in a cylinder storage area at the end of each work day.
10. All crews shall make a safety check of all equipment and LP-Gas cylinders prior to, and at the completion of the day's work
11. A fire watch shall be implemented on a daily basis after torch applications are completed. The job foreman or other designated personnel shall walk the area of application at the end of the day, checking for hot spots on the roof. A fire watch shall be conducted for a minimum of one hour after the last torch is shut off for the day.

C. *Seaming:*

1. The bleed out of bitumen is troweled to insure a complete seal and watertight integrity.
2. Proper troweling is achieved by using a heated trowel. The seam area and trowel should be heated simultaneously.
3. Use heated trowel to achieve a smooth and watertight seam at all overlaps.

### 3.03 FLASHINGS

A. Modified Bitumen Flashings:

1. Set perlite cant in elastomeric mastic or mechanically attach.
2. Install new roofing two inches minimum beyond top edge of cant.
3. Prime the wall surface with asphaltic primer.
4. Adhere flashing membrane completely to roofing membrane. Lap sheeting ends six (6) inches. Ensure complete bond without wrinkles or voids.
5. Membrane coverage - Sufficient so that after being installed, membrane will be eight (8) inches minimum up the parapet wall. It will extend at least six (6) inches beyond to edge of the cant onto the roof surface.
6. See detail drawings for individual flashing requirements.



### 3.04 DAILY WATERSTOP TIE-IN

- A. End of day
  - 1. Remove debris from top ply of felt along termination, width eighteen (18) inches.
  - 2. Adhere twelve (12) and eighteen (18) inch wide ply sheets from exposed deck to applied roofing with a continuous 1/16" inch thick application of water cut-off mastic. Extend eighteen (18) inch wide felt three (3) inches on both sides of the twelve (12) inch felt.
- B. Beginning of next day's work
  - 1. Remove temporary connection by cutting felts evenly along edge of existing roof system.

### 3.05 FIELD QUALITY CONTROL

- A. Repair of deficiencies
  - 1. Installations or details noted as deficient during Final Inspection must be repaired and corrected by applicator.

### **3.06 CLEANING**

- A. Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of debris.
- B. Contractor shall be responsible for the cost of all clean-up procedures.

**END OF SECTION 07526**