

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Two ply SBS modified bituminous membrane roofing with base and cap flashings.
- .2 Self-adhered SBS modified bituminous membrane underlayment for metal roof assembly.

1.2 RELATED SECTIONS

- .1 Section 07 62 00 Flashing and Sheet Metal
- .2 Division 22 Plumbing

1.3 REFERENCES

- .1 ASTM D2822-05 - Asphalt Roof Cement.
- .2 CAN/CGSB 37-GP-56M Amend 1985 - Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .3 CAN/ULC S107-03 - Methods of Fire Tests of Roof Coverings.
- .4 CAN/CSA A123.21-04 (R2009) - Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems.
- .5 CGSB 37-GP-9MA 1983 - Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .6 FM (Factory Mutual) - Roof Assembly Classifications.
- .7 Roofing Contractors Association of British Columbia (RCABC) - Roofing Practices Manual.
- .8 ULC (Underwriters Laboratories of Canada) - List of Equipment and Materials for:
 - .1 Building Materials.
 - .2 Fire Resistance.
 - .3 Firestop Systems and Components.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with the installation of associated metal flashings, as the work of this section proceeds.
- .2 Pre-installation Meetings:
 - .1 Convene one (1) week before starting work of this section.
 - .2 Review preparation and installation procedures and coordinating and scheduling required with related work.
- .3 Uplift resistance:
 - .1 A wind load calculation based on the NRCC 'Wind Load Calculation for roof covering and add-ons' has been performed on this building. Contractor and primary membrane manufacturer are to confirm this calculation and interpretation. Provide a letter stating the roofing assembly meets or exceeds the calculated wind uplift pressures as follows:

.1 Field area wind uplift pressure of -1.4 kPa (29 psf). Field area includes all areas not defined as Perimeter Area or Corner Area.

.2 Perimeter area wind uplift pressure of -1.9 kPa (40 psf). Perimeter area is defined as roof areas within 3.7 m (12.07') of roof edges, with exception of Corner Areas.

.3 Corner area wind uplift pressure of -2.8kPa (58 psf). Corner areas are defined as areas measuring 3.7 m (12.07') x 3.7 m (12.07') at every corner of each roof area.

.2 Reference tested assembly: PUB-DRU206751 or SOPI-204337-06-5100.

1.5 SUBMITTALS

- .1 Section 01 33 00: Submittal Procedures
- .2 Shop Drawings: Indicate setting plan for layout of seams, direction of laps, base flashing details.
- .3 Product Data: Provide membrane materials, base flashing materials, insulation, vapour retarders, and protective coating.
- .4 Manufacturer's Certificate: Certify that roof covering materials meet or exceed CAN/ULC S107 requirements for a Class C rating.
- .5 Reports: Indicate procedures followed, ambient temperatures and wind velocity during application.

1.6 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work in accordance with the Roofing Contractors Association of British Columbia Roofing Practices Manual. A 10 year RCABC guarantee shall be provided.
- .3 The membrane manufacturer's representative shall review the details with the Consultant prior to the start of work. Co-ordinate with adjacent roofing materials to ensure a continuous air vapour barrier and roof membrane installation.
- .4 The roofing inspector retained by the Owner shall review all roofing details prior to construction. Any modifications to details required to comply with requirements of the RCABC guarantee shall be communicated in writing to the Consultant.
- .5 The roofing inspector shall submit written reports to the Consultant and to the Architect and the General Contractor within 24 hours after each inspection has been conducted. The General Contractor and the Sub Contractors involved in the supply and installation of the roofing membrane and related roofing components shall comply with the direction given by the roofing inspector.
- .6 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .7 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.7 MOCK-UP

- .1 Section 01 00 00: General Instructions

- .2 Provide 3 x 3 m (10 x 10 feet) mock-up of roof membrane system and associated components and accessories, including insulation, surfacing, and typical base and counter flashings.
- .3 Locate where directed by Consultant.
- .4 Approved mock-up may remain as part of the Work.

1.8 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for roof assembly fire hazard requirements.
- .2 CAN/ULC S107: Class C Fire Hazard Classification.
- .3 FM: Roof Assembly Classification, Class 1 Construction, in accordance with FM 1-28 "Design Wind Loads".
- .4 Conform to CAN/CSA A123.21.

1.9 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- .2 Store products in weather protected environment, clear of ground and moisture.
- .3 Stand roll materials on end.

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Do not apply roofing membrane during inclement weather or ambient temperatures below -10 degrees C (14 degrees F).
- .2 Do not apply roofing membrane to damp or frozen deck surface.
- .3 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.11 WARRANTY

- .1 Contractor's Warranty: Provide Roofing Contractors Association of British Columbia Ten Year Roof Warranty, dated from time of Substantial Performance.
- .2 Manufacturer's Warranty: Provide a ten (10) year manufacturer's warranty to include coverage for failure to meet specified requirements, including damage to building resulting from failure to prevent penetration of water.

PART 2 - PRODUCTS

2.1 MEMBRANE MATERIAL

- .1 Roof Membrane: CAN/CGSB 37-GP-56M, Asphalt and polymer modifiers of styrene-butadiene-styrene (SBS) prefabricated sheet.
 - .1 Base Sheet Membrane: Composite polyester and glass mat reinforcement and elastomeric bitumen, 2.5 mm thick
Reference Product: Soprafix Base 630.
 - .1 Application: mechanically fastened:
 - .2 Top surface thermofusible plastic film.

- .3 Underside sanded.

- .2 Base Sheet Stripping: Glass mat reinforcement and elastomeric bitumen, 2.5 mm thick.
Reference Product: Soprafix Base 630.
 - .1 Application: torched
 - .2 Top surface thermofusible plastic film.
 - .3 Underside sanded.

- .3 Cap Sheet Membrane: Composite polyester and glass reinforcement and elastomeric bitumen, 4.0 mm thick.
Reference Product: Soprafix Traffic Cap 660.
 - .1 Application: torched:
 - .2 Top surface granule surfaced.
 - .3 Underside thermofusible plastic film.

- .4 Cap Sheet Stripping: Composite polyester and glass reinforcement and elastomeric bitumen, 4.0 mm thick.
Reference Product: Soprafix Traffic Cap 660.
 - .1 Application: torched:
 - .2 Top surface granule surfaced.
 - .3 Underside thermofusible plastic film.

2.2 BITUMEN MATERIALS

- .1 Asphalt Primer: CGSB 37-GP-9MA.
Reference Product: Elastocol 500 for thermofusible applications, Elastocol Stick for self-adhered applications.

- .2 Plastic Cement: ASTM D2822 Type I, cutback asphalt type.
Reference Product: Sopramastic.

2.3 ACCESSORIES

- .1 Fasteners: Hot dipped galvanized or non-ferrous type, appropriate for purpose intended and approved by system manufacturer; length required for thickness of material with metal washers.
Reference Products: Soprafix plates and deckfast screws manufactured by Soprema for Soprafix Membrane System.

- .2 Sealants: As recommended by membrane manufacturer.
Reference Product: Sopramastic.

2.4 ROOF INSULATION AND COVER BOARD MATERIALS

- .1 Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C 1289 Type I Class 1, with the following additional characteristics:
 - .1 Thickness: Maximum board thickness: 3.0"; use as many layers as necessary to achieve minimal thermal performance allowable by the BC Building Code or as per drawing and schedules, whichever is greater. Stagger joints in adjacent layers.
 - .2 Size: 1220mm (48 inches) by 2440mm (96 inches), nominal.
 - .1 Exception: Insulation to be attached using adhesive or asphalt may be no larger than 1220mm (48 inches) by 12200 (48 inches) nominal.
 - .3 R-Value (LTTR): Total thickness to meet R value as scheduled.
 - .1 25mm (1.0 inch) Thickness: 6.0, minimum.
 - .2 32mm (1.25 inch) Thickness: 7.5, minimum.
 - .3 38mm (1.5 inch) Thickness: 9.0 minimum.
 - .4 44mm (1.75 inch) Thickness 10.5, minimum.
 - .5 51 mm (2.0 inch) Thickness: 12.1, minimum.
 - .6 76 mm (3.0 inch) Thickness: 18.5, minimum.
 - .7 102 mm (4.0 inch) Thickness: 25.0, minimum.
 - .4 Compressive Strength: 138 kPa (20 psi) when tested in accordance with ASTM C 1289.
 - .5 Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - .6 Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
 - .7 Base Layer Attachment: Mechanical fastening.
 - .8 Intermediate Layer Attachment: **Mechanical fastening**
 - .9 Provide sloping Polyisocyanurate insulation package to provide all roof slopes.
- .2 Mineral Fiber-Based Cover Board: Non-combustible, water resistant mineral fiber core complying with ASTM C 1177/C 1177M. 1/4" Densdeck Prime by Georgia Pacific or RetroGard HD by Firestone.
 - .1 Attachment: Cold adhesive attachment
- .3 Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.
- .4 Adhesive for Insulation Attachment: Type as required by roof membrane manufacturer for roofing system and warranty to be provided; use only adhesives furnished by roof membrane manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verify existing conditions before starting work.
- .2 Verify that surfaces and site conditions are ready to receive work.

- .3 Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains, valleys and eaves.
- .4 Verify deck surfaces are dry and free of snow or ice.
- .5 Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set.

3.2 PREPARATION

- .1 Apply primer as per manufacturer's recommendations.

3.3 BASE SHEET MEMBRANE INSTALLATION

- .1 Unroll the base sheet membrane on the substrate without adhering, taking care to align the first strip with the centre of the drain (parallel to the edge of the roof). Let the membrane relax at least 15 minutes before installing it, or burn the plastic film in a zig-zag fashion using a propane torch to relax it. In cold weather, use the second method.
- .2 Fasten the base sheet membrane at one end, pull membrane to stretch it flat, install the appropriate anchors, proceeding toward the free end. Follow the spacing patterns recommended by the manufacturer.
- .3 Install additional anchors at roof corners and edges as well as around obstacles.
- .4 Each strip to overlap the preceding strip by 100 mm along the side joint and by 150 mm at the ends.
- .5 To avoid infiltrations, adhere the first 75 mm (3 inches) of the self-adhesive side laps using a roller, then heat-weld the last 25 mm (1 inch) to achieve combined self-adhesive and heat-welded side laps.
- .6 Seal the end joints by welding a 150 mm wide protection band centered on the joint.
- .7 At end laps, angle-cut the corners that will be covered by the following roll.
- .8 Special care must be taken to avoid creating wrinkles, blisters, and fishmouths in the base sheet membrane.

3.4 BASE SHEET FLASHING INSTALLATION

- .1 Apply base sheet flashing only after primer coat is dry.
- .2 Before applying membranes, always remove the plastic film on the section to be covered if there is an overlap (inside and outside corners and field surface).
- .3 Position the pre-cut membrane piece. Peel back 100 to 150 mm (4 to 6 inches) of the silicone release paper to hold the membrane in place at the top of the parapet.
- .4 Gradually peel back the remaining silicone release paper, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the upstand and the field surface. Smooth the entire membrane surface with a roller for full adhesion.
- .5 Cut off corners at end laps to be covered by the next roll.
- .6 Install a reinforcing gusset in all inside and outside corners.
- .7 Always seal overlaps at the end of the workday.

3.5 ROOFING CAP SHEET INSTALLATION

- .1 Once base sheet is applied and no defects are apparent, proceed with cap sheet installation.
- .2 Begin with double-selvedge starter roll. If starter roll is not used, side laps covered in granules must be degranulated by embedding side laps in torch-heated bitumen over a 100 mm width.
- .3 Unroll cap sheet at drain. Carefully align first side lap (parallel to roof edge).
- .4 Weld cap sheet onto base sheet with torch recommended by membrane manufacturer. During application, simultaneously melt both designated contact surfaces so a bead of bitumen is apparent as cap sheet unrolls.
- .5 Avoid overheating.
- .6 Make sure joints between the two layers are staggered by at least 300 mm.
- .7 Overlap cap sheet side laps by 100 mm. and end laps by 150 mm. Cut off corners at end laps to be covered by next roll. All overlap surfaces must be degranulated.
- .8 Complete perfect welds between two membranes. Leave no zone unwelded. In cold weather, adjust welding time to obtain homogenous seam.
- .9 Once cap sheet is installed, carefully check all overlapped joints.
- .10 During installation, take care to avoid excessive bitumen bleed-out at joints.

3.6 ROOFING CAP SHEET INSTALLATION - UPSTANDS AND PARAPETS

- .1 Cap sheet stripping must be installed in one meter wide strips. The side joints must overlap by 75 mm and must be staggered by at least 100 mm with respect to the joints of the cap sheet on the field surface, to avoid areas of excessive membrane thickness. The overlaps on the field surface must be 50 mm wider than those of the base sheet membrane on the upstands and parapets. At end laps, angle-cut the corners that will be covered by the following roll.
- .2 Use a chalk line to draw a straight line on the field surface 150 mm from the upstands and parapets.
- .3 Use a propane torch and round-nose trowel to embed the surface granules in the layer of hot bitumen starting from the chalk line on the field surface to the bottom edge of the upstand or parapet as well as on the granulated vertical surfaces that are to be overlapped.
- .4 The cap sheet will be heat-welded directly to the base sheet membrane, proceeding from bottom to top. This technique softens both membranes in order to obtain even, continuous weld.

3.7 DRAINAGE LAYER AND FILTER CLOTH

- .1 Prior to placement of heated concrete topping, install drainage layer and filter cloth system to provide airspace below topping to allow free flowing moisture to drain to roof drains.

3.8 FLASHINGS AND ACCESSORIES

- .1 Apply flexible sheet base flashings to seal membrane to vertical elements.

- .2 Coordinate installation of roof drains, curbs, and related flashings.
- .3 Seal flashings and flanges of items penetrating or protruding through the membrane.

3.9 FIELD QUALITY CONTROL

- .1 Provide inspection services in accordance with RCABC 10 year warranty requirements.
- .2 Monitor and report installation procedures and unacceptable conditions.
- .3 Do not conceal installed waterproofing treatment before review by Consultant and waterproofing manufacturer's representative.
- .4 Perform flood test on completed waterproofing installation before placement of other adjacent construction.
 - .1 Plug or dam drains and fill area with water to a depth of 50 mm (2 inches) or to within 13 mm (1/2 inch) of top of waterproofing treatment.
 - .2 Let water stand for 24 hours.
 - .3 If leaks are discovered, make repairs and repeat test until no leaks are observed.

3.10 CLEANING

- .1 In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- .2 Repair or replace defaced or disfigured finishes caused by work of this section.

3.11 PROTECTION OF FINISHED WORK

- .1 Protect building surfaces against damage from roofing work.
- .2 Where traffic must continue over finished roof membrane, protect surfaces.

END OF SECTION 07 52 16