

**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Materials and installation for modified bituminous roofing.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C1396/C1396M-[04], Standard Specification for Gypsum Board.
  - .2 ASTM D41-[94(2002)e1], Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
  - .3 ASTM D312-[00], Asphalt Used in Roofing.
  - .4 ASTM D6164-[00], Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-37.5-[M89], Cutback Asphalt Plastic Cement.
  - .2 CGSB 37-GP-9Ma-[83], Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
  - .3 CGSB 37-GP-15M-[84], Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
  - .4 CGSB 37-GP-19M-[85], Cement, Plastic, Cutback Tar.
  - .5 CAN/CGSB-37.29-[M89], Rubber-Asphalt Sealing Compound.
  - .6 CGSB 37-GP-56M-[80b(A1985)], Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
  - .7 CAN/CGSB-51.33-[M89], Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .3 Canadian Roofing Contractors Association (CRCA).
  - .1 CRCA Roofing Specifications Manual-[1997].
- .4 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-A123.3-[98], Asphalt Saturated Organic Roofing Felt.
  - .2 CAN/CSA-A123.4-[98], Asphalt for Use in Construction of Built-Up Roof Coverings and Waterproofing Systems.
  - .3 CSA O121-[M1978(R1998)], Douglas Fir Plywood.
  - .4 CSA O151-[M1978(R1998)], Canadian Softwood Plywood.
- .5 Underwriters Laboratories' of Canada (ULC).
  - .1 CAN/ULC-S701-[01], Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S704-[2001], Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

### **1.3 STORAGE AND HANDLING**

- .1 Provide and maintain dry, off-ground weatherproof storage.
- .2 Store rolls of felt and membrane in upright position. Store membrane rolls with selvage edge up.
- .3 Remove only in quantities required for same day use.
- .4 Place plywood runways over completed Work to enable movement of material and other traffic.
- .5 Store sealants at +5 degrees C minimum.
- .6 Store insulation protected from daylight and weather and deleterious materials.
- .7 Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.

### **1.4 PROTECTION**

- .1 Fire Extinguishers: maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle, ULC labeled for A, B and C class protection. Size 4.5 on roof per torch applicator, within 10 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each day's roofing operations cease.

### **1.5 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not install roofing when temperature remains below -18 degrees C for torch application, or -5 degrees C for mop application.
- .2 Minimum temperature for solvent-based adhesive is -5 degrees C.
- .3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

## **Part 2 Products**

### **2.1 DECK COVERING**

- .1 Gypsum Sheathing Board: to ASTM C1396/C1396M-04, 12.7 mm thick.

### **2.2 DECK PRIMER**

- .1 Asphalt primer: to CGSB 37-GP-9Ma.
  - .1 Acceptable product: Elastocol 700 and/or Elastocol 500.

### 2.3 VAPOUR RETARDER

- .1 Two-ply asphalt laminated membrane to CAN/CGSB-51.33 , Type 2, and fire retardant adhesive.
  - .1 Acceptable product: Duraperm.

### 2.4 MEMBRANE

- .1 Base sheet and base sheet flashing: to CGSB 37-GP-56M polyester fibres to ASTM D6164
  - .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester reinforcement, having nominal weight of 180 g/m<sup>2</sup>.
  - .2 Type 1, fully adhered.
  - .3 Class C - plain surfaced.
  - .4 Grade 1 - standard service.
  - .5 Top and bottom surfaces:
    - .1 polyethylene/sanded.
  - .6 Acceptable product: Elastophene 180 PS or Modiflex MP-180-FS-Base
- .2 Cap sheet membrane: to CGSB 37-GP-56M polyester fibres to ASTM D6164
  - .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, polyester reinforcement, having nominal weight of 250 g/m<sup>2</sup>.
  - .2 Type 1, fully adhered.
  - .3 Class A-granule surfaced.
    - .1 Colour for granular surface: gray.
  - .4 Grade 1-standard service.
  - .5 Bottom surface polyethylene.
  - .6 Acceptable product: Sopralene 250 GR or Torchflex TP-250-CAP

### 2.5 BITUMEN

- .1 Asphalt: to CAN/CSA A123.4, ASTM D312, Type 2.

### 2.6 ISOCYANURATE (URETHANE) INSULATION

- .1 To CAN/ULC-S704, thickness 100 mm.

### 2.7 INSULATING FIBREBOARD

- .1 To CAN/ULC-S706, Type 1-roof board, surface coated, 12.7mm thick.

### 2.8 SEALERS

- .1 Plastic cement: asphalt, to CAN/CGSB-37.5 coal tar, to CGSB 37-GP-19M.
- .2 Sealing compound: to CAN/CGSB-37.29, rubber asphalt type.

**2.9 CANT STRIPS**

- .1 Existing cant strips can be removed or left in place.

**2.10 FASTENERS**

- .1 Covering to steel deck: No. 10 flat head, self tapping, Type A or AB, cadmium plated screws.

**Part 3 Execution**

**3.1 WORKMANSHIP**

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual.
- .2 Do priming for asphalt roofing in accordance with CGSB 37-GP-15M.
- .3 Remove existing roofing and dispose at a suitable landfill site.

**3.2 EXAMINATION OF ROOF DECKS**

- .1 Inspect with Contract Administrator deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.
- .2 Prior to beginning of work ensure:
  - .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
  - .2 Curbs have been built.
  - .3 Roof drains have been installed at proper elevations relative to finished roof surface.
  - .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .3 Do not install roofing materials during rain or snowfall.

**3.3 PROTECTION**

- .1 Cover walls, walks, and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of Work.
- .3 Clean off drips and smears of bituminous material immediately.
- .4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.
- .5 Protect roof from traffic and damage.

- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.

### **3.4 DECK COVERING**

- .1 Mechanically fasten to steel deck Gypsum Board Sheathing with screws to steel deck's upper rib surfaces, spaced 400mm on centre each way.
- .2 Place with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

### **3.5 VAPOUR RETARDER**

- .1 Adhere vapour retarder using solvent based adhesive as per manufacturer's instructions.

### **3.6 EXPOSED MEMBRANE ROOFING APPLICATION**

- .1 Insulation: fully adhered, bitumen application:
  - .1 Embed insulation in 1 to 1.5 kg/m<sup>2</sup> mopping of bitumen.
  - .2 Place boards in parallel rows with ends staggered, and in firm contact with one another.
  - .3 Cut end pieces to suit.
- .2 Overlay FibreBoard application:
  - .1 Adhere 2 layers of fibreboard to insulation with full coat of hot asphalt back mopped to surface of fibreboard. The second layer bonded to first layer with full coat of hot asphalt mopped to surface of fibreboard.
  - .2 Place boards in parallel rows with end joints staggered.
- .3 Base sheet application:
  - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
  - .2 Unroll and embed base sheet in uniform coating of asphalt applied at rate of 1.2 kg/m<sup>2</sup>, at 230 degrees C.
  - .3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.
  - .4 Application to be free of blisters, wrinkles and fishmouths.
- .4 Cap sheet application:
  - .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.
  - .2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
  - .3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm minimum from those in base sheet.
  - .4 Application to be free of blisters, fishmouths and wrinkles.
  - .5 Do membrane application in accordance with manufacturer's recommendations.
- .5 Flashings:

- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
  - .2 Mop base or torch sheet onto substrate in 1 metre wide strips.
  - .3 Torch cap sheet to base sheet.
  - .4 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.
  - .5 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.
  - .6 Provide 75 mm minimum side lap and seal.
  - .7 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
  - .8 Do work in accordance with manufacturer's recommendations.
- .6 Roof penetrations:
- .1 Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with manufacturer's recommendations.

### **3.7 CANTS**

- .1 Cants can be removed or left in place.

### **3.8 METAL FLASHING**

- .1 Install all new metal flashing and caulk joints.
- .2 Metal flashing shall be a minimum of 26 gauge.

### **3.9 ROOF DRAINS**

- .1 Re-use existing roof drains or replace with new standard roof drains with a cast aluminium dome, as required.
- .2 Acceptable product: Thalar Econo Type RD 23 Aluminum.
- .3 Contract Administrator must approve the replacement of roof drains.

### **3.10 CLEANING**

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

**END OF SECTION**