

PART 1 - GENERAL

## 1.1 RELATED REQUIREMENTS

- .1 Section 07 21 13 board insulation
- .2 Section 07 62 00 Sheet metal flashing and Trim

## 1.2 REFERENCES

- .1 ASTM International Inc.
  - .1 ASTM C 1177/C 1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - .2 ASTM D 41/D 41M-11, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
  - .3 ASTM D 6162-00a(2008), Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
  - .2 CGSB 37-GP-56M, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .3 Canadian Roofing Contractors Association (CRCA)
  - .1 CRCA Roofing Specifications Manual-2011.
- .4 Canadian Standards Association (CSA International)
  - .1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 Underwriters Laboratories' of Canada (ULC)
  - .1 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

## 1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with roofing contractor's representative and Departmental Representative Construction Progress Schedules to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

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- 1.4 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00  
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Submittal Procedures.
- 1.5 QUALITY ASSURANCE
- .1 Installer qualifications: company or person specializing  
in  
application of modified  
bituminous roofing systems with 5 years documented  
experience  
and approved by manufacturer.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- .1 Deliver, store and handle materials in accordance with  
manufacturer's written instructions.
- .2 Storage and Handling Requirements:
- .1 Safety: comply with requirements of Workplace Hazardous  
Materials Information System (WHMIS) regarding use,  
handling,  
storage, and disposal of asphalt, sealing compounds,  
primers  
and caulking materials.
- .2 Provide and maintain dry, off-ground weatherproof  
storage.
- .3 Store rolls of felt and membrane in upright position. Store  
membrane rolls with salvage edge up.
- .4 Remove only in quantities required for same day use.
- .5 Place plywood runways over completed Work to enable movement  
of material and other traffic.
- .6 Store sealants at +5 degrees C minimum.
- .7 Store insulation protected from daylight and weather and  
deleterious materials.
- .1 Collect and separate plastic, paper packaging and  
corrugated cardboard in accordance with Waste Management  
Plan.
- .8 Collect and separate plastic, paper packaging and corrugated  
cardboard in accordance with Waste Management Plan.
- 1.7 SITE CONDITIONS
- .1 Ambient Conditions
- .1 Do not install roofing when temperature remains below  
-18  
degrees C for torch application, or -5 degrees C to  
manufacturers' recommendations for mop application.
- .2 Minimum temperature for solvent-based adhesive is -5  
degrees  
C.
- .2 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.

## 1.8 WARRANTY

- .1 For Work of this Section 07 52 00 - Modified Bituminous Membrane Roofing, 12 months warranty period is extended to 24 months.

PART 2 - PRODUCTS

## 2.1 PERFORMANCE CRITERIA

- .1 Compatibility between components of roofing system is essential.  
Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.
- .2 All roofing system products to be supplied by single company source or be approved for compatible use by roofing system manufacture.
- .3 Roofing System: to CSA A123.21 for wind uplift resistance.

## 2.2 DECK COVERING

- .1 Gypsum board sheathing: to ASTM C 1396/C 1396M Standard 12.7 mm thick.

## 2.3 PRIMER

- .1 Asphalt primer: to CGSB 37-GP-9Ma ASTM D 41.

## 2.4 VAPOUR RETARDER

- .1 Base sheet: to CGSB 37-GP-56M polyester fibres to ASTM D 6164 glass fibres to ASTM D 6163 combination of polyester and glass fibres to ASTM D 6162.
- .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, glass or 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.
- .6 Base sheet membrane properties: to CGSB 37-GP-56M.

## 2.5 INSULATION

- .1 Rigid closed cell polyisocyanurate insulation bonded on upper and lower surfaces to an inorganic glass fibre facer. Material

shall meet CAN/CGSB-51.26-M86 and CAN/ULC-S704, The boards shall be distributed in 1200mm x 1200mm panels, pre-wrapped to prevent moisture ingress.

- .2 Fibrous glass batts, friction fit, unfaced to CSA A101 latest edition.

## 2.6 MEMBRANE

- .1 Base sheet: to CGSB 37-GP-56M polyester fibres to ASTM D 6164 glass fibres to ASTM D 6163 combination of polyester and glass fibres to ASTM D 6162.

- .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, glass or 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.
- .6 Base sheet membrane properties: to CGSB 37-GP-56M.

- .2 Cap sheet membrane and Walkways: to CGSB 37-GP-56M combination of polyester and glass fibres to ASTM 6162.

- .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, glass or 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 .
- .4 Grade 1-standard service.
- .5 Bottom surface polyethylene.
- .6 Cap sheet membrane properties: to CGSB 37-GP-56M.

## 2.7 CANT STRIPS

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- .1 Cut from solid wood material, to measure 140 mm on slope.

## 2.8 ADHESIVE

- .1 Adhesive for securing insulation, tapered insulation and overlay board shall be
  - a) an asphalt extended vulcanized adhesive.
  - b) a single component urethane adhesive, dispensed from a portable pre-pressurized container requiring no external power source.
  - c) a single component solvent free moisture curing adhesive.
  - d) a two component, elastomeric, moisture cured; low rise urethane foam adhesive that contains no solvents.
- .2 Adhesive for securing overlay board and insulation or a solvent-free moisture curing adhesive.

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2.9 OVERLAY BOARD

- .1 Overlay Board: 6 mm thick asphalt based recovery board with non-woven glass facers, as recommended by the membrane manufacturer.

- .1 Install over insulation to provide torch safe surface and cover joints with self adhesive fire resistant tape as specified in 2.2.2.

## 2.10 ACCESSORIES

- .1 Vent Stack Flashings and guy line flashing: to be spun aluminum sleeve to fit over the vent stack with sufficient space to insulate. A spun aluminum cap to fit outside the sleeve and inside the vent stack inside diameter.

PART 3 - EXECUTION

## 3.1 QUALITY OF WORK

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual.
- .2 Do priming in accordance with manufacturers written recommendations.

## 3.2 EXAMINATION OF ROOF DECKS

- .1 Verification of Conditions:
  - .1 Inspect with Departmental Representative deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.
- .2 Evaluation and Assessment:
  - .1 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 OF IN-PLACE CONDITIONS

- .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. Comply with precautions deemed necessary by Departmental Representative.

.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.

.7 Metal connectors and decking will be treated with rust proofing or galvanization.

#### 3.4 DECK SHEATHING

.1 Mechanically fasten to wood deck Gypsum Board Sheathing with screws to wood deck surfaces, spaced 400 mm on centre each way.

#### 3.5 PRIMING DECK

.1 Apply deck primer to wood roofing substrate at the rate recommended by manufacturer.

#### 3.6 VAPOUR RETARDER (WOOD DECK)

.1 Secure one-ply underlay sheet with reversible mechanical attachments spaced at 150 mm on centre along seams and at 300 mm in field of sheets.

.2 Embed two ply of felts glass in hot bitumen spread at rate of 1.2 kg/m<sup>2</sup> for glass asphalt.

.3 Modified bituminous vapour retarder sheet. Unroll and let relax prior to installation.

#### 3.7 (EXPOSED) CONVENTIONAL MEMBRANE ROOFING (CMR) APPLICATION

.1 Insulation: fully adhered, adhesive application:

.1 Adhere insulation laminated vapour barrier using solvent-based adhesive.

.2 Place boards in parallel rows with ends staggered, and in firm contact with one another.

.3 Cut end pieces to suit.

.4 Apply adhesive in continuous ribbons at 300 mm on centre.

.5 Separate the membrane and insulation with a drainage layer or slipsheet.

.2 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.

.3 Insulation: mechanically fastened application:

.1 Mechanically fasten insulation using screws and pressure distribution plates.

.2 Fasten insulation as per manufacturer's written recommendations.

.3 Number and pattern of screws per board to meet Factory Mutual requirements.

.4 Place boards in parallel rows with ends staggered, and in firm contact with one another.

.5 Cut end boards to suit.

.4 Overlay Board: adhesive application:

- .1 Adhere overlay board to insulation with vulcanized adhesive at the rate of one litre per m<sup>2</sup>.
- .2 Place boards in parallel rows with end joints staggered. Cap joints approximately 25 mm.
- .3 Cut ends to suit and apply adhesive in continuous ribbons at 300 mm on centre.

.5 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 torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.
- .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.

.6 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 embed cap sheet in uniform coating of asphalt applied at rate of 1.2 kg/m<sup>2</sup>, EVT at point of contact.
- .3 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
- .4 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.
- .5 Application to be free of blisters, fishmouths and wrinkles.
- .6 Do membrane application in accordance with manufacturer's recommendations.

.8 Flashings:

- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
- .2 mopbaseand cap sheet onto substrate in 1 metre wide strips.
- .3 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.
- .4 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.

- .5 Provide 75 mm minimum side lap and seal.
- .6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
- .7 Do work in accordance with manufacturer's recommendations Section 07 62 00 - Sheet Metal Flashing and Trim.
- .8 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 and details.

## 3.8 CANTS

- .1 Apply hot bitumen to receiving surface and embed cant firmly by hand.
  - .1 Fasten wood cants to wood insulation stops.
- .2 Angle cut cants to fit tightly on back and bottom where roof to wall angle varies from 90 degrees.

## 3.9 WALKWAYS

- .1 Install walkway membrane in accordance with manufacturer's instructions and as indicated.

## 3.10 FIELD QUALITY CONTROL

- .1 Inspections:
  - .1 Inspection and testing of roofing application will be carried out by testing laboratory designated by Departmental Representative.
  - .2 Inspection and testing of roofing application will be carried out by testing laboratory designated by Departmental Representative.
  - .3 Costs of tests will be paid under cash allowance.

## 3.11 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.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal..



- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Clearly label location of salvaged material's storage areas and provide barriers and security devices.
- .3 Ensure emptied containers are sealed and stored safely.
- .4 Divert unused aggregate materials from landfill to local facility for reuse as reviewed by Departmental Representative.
- .5 Unused paint or coating material must be disposed of at official hazardous material collections site as reviewed by Departmental Representative.
- .6 Unused adhesive, sealant and asphalt materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .7 Dispose of unused adhesive material at official hazardous material collections site approved by Departmental Representative .
- .8 Dispose of unused sealant material at official hazardous material collections site approved by Departmental Representative.
- .9 Dispose of unused asphalt material at official hazardous material collections site approved by Departmental Representative.
- .10 Divert unused gypsum materials from landfill to recycling facility as reviewed by Departmental Representative.