

MODIFIED BITUMINOUS MEMBRANE ROOFING

1. GENERAL

1.1 References

- .1 Canadian Roofing Contractors Association (CRCA):
 - .1 CRCA Roofing Specifications Manual.
- .2 Canadian Standards Association (CSA):
 - .1 CSA A123.21, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems.
 - .2 CSA A123.3, Asphalt Saturated Organic Roofing Felt.
 - .3 CSA A123.4, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
 - .4 CSA A231.1/A231.2, Precast Concrete Paving Slabs/Precast Concrete Pavers.
 - .5 CSA O121, Douglas Fir Plywood.
 - .6 CSA O151, Canadian Softwood Plywood.
- .3 The Workplace Health and Safety Act (Manitoba), Workplace Health and Safety Regulation:
 - .1 Safety Data Sheets (SDS).
- .4 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC-S701.1, Standard for Thermal Insulation, Polystyrene, Boards.
 - .2 CAN/ULC-S702.1, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification.
 - .3 CAN/ULC-S702.2, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 2: Installation.
 - .4 CAN/ULC-S704.1, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced.
 - .5 CAN/ULC-S706.1, Standard for Wood Fibre Insulating Boards for Buildings.

1.2 Administrative Requirements

- .1 Convene pre-installation meeting three (3) to four (4) weeks prior to beginning waterproofing Work, with roofing contractor's representative and Contract Administrator.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.

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- .3 Co-ordination with other building subtrades.
- .4 Review installation instructions and warranty requirements.

1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with City of Winnipeg Standard Construction Specification, CW 1110.
- .2 Product Data:
 - .1 Provide two (2) copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Provide Shop Drawings:
 - .1 Indicate flashing details.
 - .2 Provide layout for tapered insulation.
- .4 Manufacturer's Certificate: certify that products meet or exceed specified requirements.
- .5 Test and Evaluation Reports: submit laboratory test reports certifying compliance of bitumen's and roofing felts and membrane with specification requirements.
- .6 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

1.4 Quality Assurance

- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with five (5) years documented experience approved by manufacturer.

1.5 Fire Protection

- .1 Fire Extinguishers:
 - .1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labelled for A, B and C class protection.
 - .3 Size 9 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for one (1) hour after each day's roofing operations cease.

1.6 Delivery, Storage, and Handling

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:

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- .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°C minimum.
- .7 Store insulation protected from daylight and weather and deleterious materials.

1.7 Site Conditions

- .1 Ambient Conditions:
 - .1 Do not install roofing when temperature remains below -18°C for torch application, or -5°C to manufacturers' recommendations for mop application.
 - .2 Minimum temperature for solvent-based adhesive is -5°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.
- .3 Deck shall be high pressure sand blasted prior to installation if material is going on an existing surface.

1.8 Warranty

- .1 For Work of this Section 07 52 00 - Modified Bituminous Membrane Roofing, twelve (12) months warranty period is extended to twenty-four (24) months except as stipulated in CW Supplemental Conditions D21.

2. PRODUCTS

2.1 Performance Criteria

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Contract Administrator stating that materials and components, as assembled in system, meet this requirement.
- .2 Roofing System: to CSA A123.21 for wind uplift resistance.

2.2 Deck Covering

- .1 Glass Mat, Gypsum Board: to ASTM C 1177 12.7 mm thick.

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2.3 Deck Primer

- .1 Asphalt primer: to manufacturer's recommendations.

2.4 Vapour Retarder

- .1 Base sheet self adhered vapour retarder: Styrene-Butadiene-Styrene (SBS) elastomeric polymer glass reinforcement, weighing 180 g/m².

2.5 Membrane

- .1 Base sheet:
 - .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, glass reinforcement, having nominal weight of 180g/m².
 - .2 Type 2.
 - .3 Class C - plain surfaced.
 - .4 Grade heavy duty service.
 - .5 Top and bottom surfaces:
 - .1 sanded/polyethylene.
 - .6 Base sheet membrane properties:
 - .1 Strain energy (longitudinal/transversal): 8.1/8.8 kN/m.
 - .2 Breaking strength (longitudinal/transversal): 17.0/12.5 N/5 cm.
 - .3 Ultimate elongation (longitudinal/transversal): 60/65%.
 - .4 Tear resistance: 60 N.
 - .5 Cold bending at -30°C: no cracking.
 - .6 Softening point: 110°C.
 - .7 Static puncture resistance: > 300.
 - .8 Dimensional Stability: -0.3/0.3%.
- .2 Cap sheet membrane:
 - .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, glass reinforcement, having nominal weight of 250 g/m².
 - .2 Type 2.
 - .3 Class A-granule surfaced.

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- .1 Colour for granular surface: gray.
- .4 Grade heavy duty service.
- .5 Bottom surface polyethylene.
- .6 Cap sheet membrane properties:
 - .1 Strain energy (longitudinal/transversal): 11.0/11.4 kN/m.
 - .2 Breaking strength (longitudinal/transversal): 25.0/16.0 kN/m.
 - .3 Ultimate elongation (longitudinal/transversal): 60/65%.
 - .4 Tear resistance: 80 N.
 - .5 Cold bending at -30°C: No cracking.
 - .6 Softening point: \leq 110°C.
 - .7 Static puncture resistance: > 370.
 - .8 Dimensional Stability: -0.2/0.2%.

2.6 Adhesive

- .1 Adhesive for securing overlay board and insulation: asphalt extended vulcanized adhesive, two component unit, consisting of two liquids mixed on site to produce pourable adhesive.

2.7 Overlay Board

- .1 Overlay Board: 12.7 mm to ASTM C 1177M.
- .2 Install over insulation to provide torch safe surface.

2.8 Bitumen

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

2.9 Polystyrene Insulation

- .1 CAN/ULC-S701 Type 2 POLYISOCYANURATE board with skin surface. Thickness as indicated.
- .2 Sloped, Type 2 polyisocyanurate board. Minimum thickness: 25 mm.

2.10 Sealers

- .1 Plastic cement: asphalt.
- .2 Sealing compound: rubber asphalt type.

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2.11 Carpentry

- .1 Refer to Section 06 10 00 - Rough Carpentry.

2.12 Fasteners

- .1 Insulation to deck: coated insulation fasteners and galvanized plates must meet FM Approval for wind uplift and corrosion resistance, as recommended by insulation manufacturer.

3. EXECUTION

3.1 Quality of Work

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual, particularly for fire safety precautions. Do priming in accordance with manufacturers written recommendations.
- .2 The interface of the walls and roof assemblies will be fitted with durable rigid material plywood providing connection point for continuity of air barrier.
- .3 Assembly, component and material connections will be made in consideration of appropriate design loads.

3.2 Examination of Roof Decks

- .1 Verification of Conditions:
 - .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 Review deck conditions with contract administrator. Curbs have been built.
 - .2 Roof drains have been installed at proper elevations relative to finished roof surface.
 - .3 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, sloped roofs 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.

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- .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 Contract Administrator.
- .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 Priming Deck

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

3.5 Vapour Retarder (Concrete Deck)

- .1 Adhere Styrene-Butadiene-Styrene (SBS) elastomeric polymer glass reinforcement, weighing 180 g/m² to deck.
- .2 Modified bituminous vapour retarder sheet.

3.6 (Exposed) Conventional Membrane Roofing (CMR) Application

- .1 Fully adhered, adhesive application:
 - .1 Adhere insulation to 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 slip-sheet.
- .2 Tapered insulation application:
 - .1 Adhere insulation to vapour retarder and top layer of insulation to bottom layer with solvent based adhesive.
 - .2 Install tapered insulation as second insulation layer, in accordance with shop drawings. Stagger joints between layers 150 mm minimum.
- .3 Overlay Board: adhesive application:
 - .1 Adhere overlay board to insulation with vulcanized adhesive at the rate of 1 L/m².
 - .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.

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- .4 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 fish mouths.
- .5 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, fish mouths and wrinkles.
 - .5 Do membrane application in accordance with manufacturer's recommendations.
- .6 Flashings:
 - .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
 - .2 Torch base and cap sheet onto substrate in 1 m 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, fish mouths or wrinkles.
 - .7 Do work in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim.
- .7 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.

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3.7 Field Quality Control

- .1 Inspection agency must be fully experienced with membrane and installation procedures.
- .2 Inspection and testing of roofing application will be carried out by testing laboratory designated by Contract Administrator. Costs of tests will be paid under cash allowance of \$5000.

3.8 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 documented instructions.
- .3 Repair or replace defaced or disfigured finishes caused by Work of this Section.

END OF SECTION