

PART 1 - GENERAL

1.1 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM C 1177/C 1177M-06, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .2 ASTM C920-11 Standard Specification for Elastomeric Joint Sealants
 - .3 ASTM D 41-11 (2011), Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - .4 ASTM D 312-00 (2006), Standard Specification for Asphalt Used in Roofing.
 - .5 ASTM D 2178-04, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
 - .6 ASTM D 6162-00a, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .7 ASTM D 6163-00e1, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
 - .8 ASTM D 6164-05, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester 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-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
 - .3 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-(2012).
- .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
 - .2 CSA-A123.3-05, Asphalt Saturated Organic Roofing Felt.
 - .3 CSA O121-08, Douglas Fir Plywood.
 - .4 CSA O151-04, Canadian Softwood Plywood.
- .5 Factory Mutual (FM Global)
 - .1 FM Approvals - Roofing Products.
- .6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

- .7 Underwriters Laboratories' of Canada (ULC)
 - .1 CAN/ULC-S107-10 "Standard Methods of Fire Tests of Roof Coverings."
 - .2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .3 CAN/ULC-S702.2-03, Standard for Mineral Fibre Thermal Insulation for Buildings.
 - .4 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.2 NEW ROOFING SYSTEM .1 DESCRIPTION

- New 2 ply roofing system assembly over existing sloped metal roof:
- .1 Primary Membrane: 2 ply SBS membrane
 - .2 Cover Board: 15.08mm tongue and groove plywood, purpose made, insulation cover protection board.
 - .3 Primary Insulation: polyisocyanurate insulation between ribs of existing metal roof:
 - .1 thickness to be determined on site as required to provide even sloped surface for deck cover board substrate.
 - .4 Air/Vapour Barrier: Self-adhering membrane.
 - .5 Deck: Existing metal deck

1.3 NEW ROOFING SYSTEM .1 PERFORMANCE CRITERIA 1

- Wind Uplift:
- .1 Roofing System: to CSA A123.21 for wind uplift resistance.
 - .2 4.3kPA (90psf), minimum.
 - .3 Submit test results confirming performance to wind up-lift pressure.
- .2 Compatibility between components of roofing system is essential. Submit written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with roofing contractor's representative, roofing manufacturer's representative and Departmental Representative in accordance with Section 01 32 16 - 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.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 System data:
 - .1 Provide 2 copies of most recent wind up-lift performance test.

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- .2 Provide 2 copies of material compatibility declaration.
 - .3 Product Data:
 - .1 Provide 2 copies of most recent technical roofing components data sheets describing materials' physical properties and include product test certificates, characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide 2 copies of WHMIS MSDS in accordance with Section 01 35 43:
 - .1 Primers.
 - .2 Asphalt.
 - .3 Sealers.
 - .4 Provide shop drawings:
 - .1 Indicate flashing, control joints, partitioning joints, insulation details.
 - .2 Provide layout for insulation.
 - .3 Specialty roof accessories
 - .5 Manufacturer's Certificate: certify that products meet or exceed specified requirements.
 - .6 Test and Evaluation Reports: submit laboratory test reports certifying compliance of bitumens and membrane with specification requirements.
 - .7 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.
 - .8 Manufacturer's periodic field report: in accordance with Section 01 45 00 - Quality Control.
 - .1 Submit to manufacturer's written reports within 3 days of review, verifying compliance of Work.
 - .9 Reports: indicate procedures followed, ambient temperatures and wind velocity during application.
- 1.6 QUALITY ASSURANCE
- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with 5 years documented experience approved by manufacturer.
- 1.7 FIRE PROTECTION
- .1 Fire Extinguishers:
 - .1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labeled for A, B and C class protection.
 - .3 Sizes as required on roof per torch applicator, within industry best practice distance of torch applicator.
 - .2 Maintain fire watch for 1 hour after each day's roofing operations cease.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.

- .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.
- .3 Packaging Waste Management: remove for reuse and return of pallets crates padding and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
 - .2 Fold up metal banding, flatten and place in designated area for recycling.

1.9 SITE CONDITIONS

- .1 Ambient Conditions
 - .1 Do not install roofing when temperature remains below manufacturers' recommendations.
 - .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.

1.10 WARRANTY

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

1.11 Manufacturer Guarantee

- .1 Provide to Her Majesty the Queen in the Right of Canada manufacturer's roofing system performance guarantee for 10 years.

PART 2 - PRODUCTS

2.1 DECK COVERING

- .1 Tongue and groove plywood 15.08 mm thick minimum or as recommended by contractor's roof consultant.
 - .1 Confirm existing metal deck flute spacing to meet manufacture's deck covering board recommended maximum span between flutes.

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| <u>2.2 DECK PRIMER</u> | .1 | Asphalt primer: to CGSB 37-GP-9Ma. |
| <u>2.3 VAPOUR RETARDER AND AIR BARRIER</u> | .1 | Styrene-Butadiene-Styrene (SBS) Membrane: <ul style="list-style-type: none"> .1 Self-adhesive membrane to CGSB 37-GP-56M. <ul style="list-style-type: none"> .1 Thickness: 1mm, minimum or, .2 Mopping grade membrane to CGSB 37-GP-56M. <ul style="list-style-type: none"> .1 Thickness: 2mm, minimum. .3 Provide one type. |
| <u>2.4 MEMBRANE</u> | .1 | Membrane Base Sheet for Thermofusible Cap Sheet: to CGSB 37-GP-56M and CAN/ULC-S107. <ul style="list-style-type: none"> .1 Styrene-Butadiene-Styrene (SBS) <ul style="list-style-type: none"> .1 Type: 2, A- Fully Adhered, B-Partially Attached. .2 Class C, Plain Surface .3 Grade 2, Heavy Duty |
| | .2 | Thermofusible Cap Sheet membrane: to CGSB 37-GP-56M and CAN/ULC-S107. <ul style="list-style-type: none"> .1 Styrene-Butadiene-Styrene (SBS) <ul style="list-style-type: none"> .1 Type: 1, A- Fully Adhered, .2 Class A, Granule Surfaced .3 Grade 2, Heavy Duty |
| <u>2.5 ADHESIVE</u> | .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. |
| <u>2.6 INSULATION COVER OVERLAY BOARD SHEATHING</u> | .1 | Purpose made, semi-rigid, asphaltic core, faced with saturated glass fibre felts. <ul style="list-style-type: none"> .1 Thickness, to suit site conditions. .2 Install over insulation to provide impact resistance and torch safe surface. |
| <u>2.7 POLYISOCYANURATE INSULATION</u> | .1 | To CAN/ULC-S704, Type 3, Faced, flame spread classification: less than 500, <ul style="list-style-type: none"> .1 Thickness: 100mm minimum at 50mm per layer. .2 Tapered insulation: slope to drain as indicated. .3 RSI per 25 mm thick: 0.97 minimum |
| <u>2.8 SEALERS</u> | .1 | Plastic cement: asphalt. |
| | .2 | Sealing compound rubber asphalt type. |
| | .3 | Sealants: Metal to metal one part high performance silicone Sealant to CAN/CGSB-19.13/ ASTM C920 Type S, Grade NS, Class 50 <ul style="list-style-type: none"> .1 Primer as recommended by sealant manufacturer. .2 Application as per sealant manufacturer written instructions |

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| <u>2.9 CARPENTRY</u> | .1 | Refer to Section 06 08 99 - Rough Carpentry - Short For Minor Works. |
| <u>2.10 FASTENERS</u> | .1 | Covering to steel deck: No. 10 flat head, self tapping, Type A or AB, cadmium plated screws. Recommend FM Approved screw and plate assemblies. |
| | .2 | Insulation to deck: coated insulation fasteners and galvanized plates must meet FM Approval for wind uplift and corrosion resistance, as recommended by insulation manufacturer. |

PART 3 - EXECUTION

3.1 QUALITY OF WORK

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| | .1 | Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual. |
| | .2 | Do priming in accordance with manufacturers written recommendations. |
| | .3 | The interface of the walls and roof assemblies will be fitted with durable rigid material sheet metal providing connection point for continuity of air barrier. |
| | .4 | Assembly, component and material connections will be made in consideration of appropriate design loads, with reversible mechanical attachments. |

3.2 EXAMINATION OF ROOF DECKS

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| | .1 | Verification of Conditions:

.1 Inspect with Departmental Representative deck conditions including parapets, construction joints, gable end condition, eaves troughs, and downs-pipes 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 if required.
.3 Roof drainage installed at proper elevations relative to finished roof surface.
.4 Plywood and lumber nailer plates have been installed to deck, walls and eaves as required. |
| | .3 | Do not install roofing materials during rain or snowfall. |

3.3 PROTECTION OF
IN-PLACE CONDITIONS

- .1 Use warning signs and barriers. Maintain in good order until completion of Work.
- .2 Clean off drips and smears of bituminous material immediately.
- .3 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.
- .4 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.
- .4 Metal connectors and decking will be treated with rust proofing or galvanization.

3.4 PARTITIONING/
CONTROL JOINTS

- .1 Provide joint as per manufacturer's written instructions including:
 - .1 Installation details.
 - .2 Specific locations

3.5 DECK SHEATHING

- .1 Mechanically fasten to steel deck sheathing screws to steel deck's upper rib surfaces, spaced as required to withstand wind up-lift.
- .2 Place with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

3.6 PRIMING DECK

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

3.7 VAPOUR RETARDER /
AIR BARRIER MEMBRANE
GYPSUM BOARD OVER
STEEL DECK

- .1 Modified bituminous vapour retarder/air barrier sheet membrane, install as per manufacturer's recommendations.

3.8 (EXPOSED)
CONVENTIONAL
MEMBRANE ROOFING
(CMR) APPLICATION

- .1 Insulation: mechanically fastened application:
 - .1 Mechanically fasten insulation using screws and pressure distribution plates reversible mechanical attachments.
 - .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.
 - .6 Stagger joints between layers 150 mm minimum.
- .2 Insulation application:

- .1 Install tapered insulation in accordance with shop drawings.
- .3 Insulation Cover Overlay Board:
 - .1 Mechanically fasten or adhere and per manufacturer's recommendations to meet roofing system wind up-lift performance requirements.
 - .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.
 - .4 Apply self adhering fire prevention tape cover to board substrate gaps, cracks and voids as conditions and industry best practices warrant.
- .4 Base sheet application:
 - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends and allow to relax.
 - .2 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.
 - .3 Application to be free of blisters, wrinkles and fishmouths.
 - .4 Mechanically fastened membrane.
 - .1 Provide as per manufacture's written instructions including:
 - .1 Transition tape cover at corners voids and changes in direction.
 - .2 Thermal lap fussing.
 - 3 Screw and plate fastening requirements throughout the roof area, curbs and projections. .
 - .5 Adhered or asphalt embedded membrane.
 - .1 Provide as per manufacture's written instructions.
- .5 Cap sheet application:
 - .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends and allow to relax.
 - .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.
- .6 Flashings:
 - .1 Complete installation of flashing base sheet stripping prior to installing cover sheet at edges of roof.
 - .2 Nail mop or torch base and torch apply edge 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 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.

.7 Roof penetrations:

.1 Remove, make good and reinstall existing roof penetrations if and as required. Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with manufacturer's recommendations.

3.9 FIELD QUALITY CONTROL

.1 Field Quality Control:

.1 Field quality control of roofing application may be carried out by Departmental Representative.

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 documented 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 quarry for reuse as reviewed by Departmental Representative.

.5 Unused paint 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.

----END OF SECTION----