

DIVISION 07 THERMAL AND MOISTURE PROTECTION

Section 07 00 00 General

- 1 Information relates to the Department's technical requirements regarding damp-proofing and waterproofing, thermal protection, shingles and roof coverings, roofing and siding panels, membrane roofing, flashing and sheet metal, roof specialties and accessories, fire and smoke protection, joint sealers, and the like.
- 2 Building Envelope
 - 2.1 Provide building envelopes that effectively and efficiently separate the interior from the exterior environment by controlling the movement of air (not more than 0.1 L/S per m² at 75 Pa.), water, heat, and water vapour using assemblies that are practical, constructable, and economical while minimizing operating and maintenance life cycle costs.
 - 2.2 Refer to DC350, Part 1, Section 1, Item 9 - Building Envelope Assemblies regarding design and detail of the building envelope.
 - 2.3 Design building envelope to eliminate thermal bridging and condensation
- 3 Extended Warranty: Unless otherwise specified herein:
 - 3.1 Project manual to specify requirements of manufacturer's warranty against manufacturer's defects on all roofing membrane materials for a period of nine (9) years beyond the date of expiration of performance assurance.
 - 3.2 Project manual to specify requirement of a contractor's warranty extending the warranty for all roofing labour and workmanship for a period of one (1) year beyond the date of expiration of performance assurance requirements specified in the General Conditions.
 - 3.3 Project manual to specify requirement for extended warranty, from the roofing contractor, for defects in materials and workmanship of the sheet metal work incorporated into design. Warranty to cover a period of 1 year beyond the expiration of the performance assurance requirements specified in the General Conditions.
 - 3.4 Make provision in the project manual for extended warranty, from the roof coating manufacturer addressed to the Minister, where roof coating is incorporated into design. Warranty to cover defects in manufacturing for a period of five (5) years beyond the date of expiration of performance assurance requirements specified in the General Conditions. Longer periods may be required. Discuss requirements with DTIR.

- 3.5 Replacement shall include, where applicable, removal of all defective roof assembly materials, installation of new roofing assembly in affected area, and repair and making good of displaced and adjacent Work damaged during replacement. As a minimum, indicate defective work will include, but not be limited to, leaking, wind uplift, delamination of roofing material, reduction of thermal value due to moisture in insulation, crazing, or ridging.
- 3.6 Extended Warranties shall be non-prorated.
- 4 Overburden Extended Warranty for green roofs
- 4.1 Project manual to specify the requirement for a ten (10) year overburden extended warranty from the Roofing manufacturer which covers the removal, roof repair and replacement of all roofing components above the membrane; including protection fabric, polystyrene, drainage products, moisture retention mat, growth media, and roof garden plants in the event of a leak.
- 5 Roofing
- 5.1 Quality Assurance
- 5.1.1 Consultant shall incorporate roofing details into the design ensuring the finished roof meets or exceeds the CSA A123.21-14 wind uplift load standards and the requirements of CRCA, unless specified otherwise. Design for a higher FM wind uplift where required by regional climatic data.
- 5.1.2 The roof design must meet a Class A, B or C Rating as required by occupancy and size and defined in ULC 107-10 "Method of Fire Test of Roof Coverings." Proof of this compliance must be provided.
- 5.1.3 A start-up meeting will be held with the roof membrane manufacturer's representative and inspection reports will be provided during installation.
- 5.1.4 Roofing system must be applied by a roofing contractor authorized by the roofing manufacturer to meet all warranty requirements.
- 5.1.5 Upon completion of the installation, an inspection shall be made by a representative of the roofing manufacturer to ascertain that the roofing system has been installed according to required specifications and details. Manufacturer's representative shall provide a written final inspection report.
- 5.2 Roofing
- 5.2.1 All penetrations to be carefully detailed and components identified.

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- 5.2.2 At roof and wall junctions, ensure the roof membrane is extended a minimum of 300 mm up walls. Ensure the wall's construction sequence does not interfere with the continuous operation of the roofing work.
- 5.2.3 Roofing surfaces, including parapets, to be sloped to drain. Design the drainage to promote the rapid removal of water.
- 5.2.4 Slope all roof surfaces to drain at a low point. Level valleys are not acceptable. Minimum slope required is 2%. Form the slopes in the structure. Do not use insulating fill or insulation to obtain slopes except for:
- 5.2.4.1 Re-roofing
 - 5.2.4.2 Augmentation of sloped structural systems, such as at crickets.
- 5.2.5 Metal deck to be covered by a non-paper backed exterior grade drywall, or rigid mineral wool insulation board with actual density of 11 lb/ft³ top surface coated with bitumen, before installation of a vapour barrier.
- 5.2.6 Generally maintain the same elevation around the perimeter of roof. If roof edge is sloped, detail the extreme conditions at the high and low points of the slope.
- 5.2.7 Slope flashing surfaces minimum 1:6.
- 5.2.8 All metal roofing and counter flashing elements are to be considered only as water shedding elements below which a waterproofing membrane is required. Do not design metal flashing (except sheet lead) to be part of the waterproofing system.
- 5.2.9 Provide open flow roof drains with strainer domes. Provide minimum number of drains for each roof area designed to take into account expected loading conditions. Designed roof to maintain required slope. Incorporate roof dividers into design where required to maintain slope and drainage requirements.
- 5.2.10 Raise all penetrations and perimeters of the roofing membrane above 300mm adjacent roofing membrane level. See Section 07 70 00. Discuss with DTIR for exceptions, and design details.
- 5.2.11 Provide access to roofs.
- 5.2.12 In all roof assemblies, ensure uppermost face of rigid insulation is protected by an application of at least 1 layer of protective cover board with a minimum thickness of 12.7 mm; and when using expanded or extruded polystyrene

insulation, 2 layers of protective cover board each 12.7mm thick, staggered with joints off set from main insulation board joints.

5.2.13 Use the ballasted, protected membrane roofing system only when permitted by DTIR. Section 07 53 00.2 says that ballasted and IRMA not allowed??? Use precast slabs as the ballast and protective surfacing in required locations.

5.2.14 Where required by code specify a material with the required fire resistance rating, but having a minimum thickness not less than 12.7 mm.

6 Adhesives

- 6.1 All adhesives to meet emission and toxicity standards published by Environment Canada (Ecologo labels) and CSA.
- 6.2 Adhesives for cold-applied roofing products to CAN/CGSB 37.

7 Storage and Handling of Roofing Materials

- 7.1 Store all roll material in an upright position in a dry location with temperature maintained within manufacturers' recommended tolerances. Use materials in roof construction within 4 hours of removal from storage.
- 7.2 Keep all roofing material and adhesives away from ignition sources.
- 7.3 Roll out and allow material to relax a minimum of 30 minutes before installation, or to manufacturer's instructions.
- 7.4 Consult all container labels, Material Safety Data Sheets, and technical information for safety information specific to the products used.
- 7.5 Use roof system products from the same manufacturer and do not use materials or methods which will invalidate manufacturer's warranty.
- 7.6 Measures to be specified and followed to prevent intake of adhesives or other construction odours from the roof construction into occupied areas through rooftop air intake units.

8 Roofing over existing roof surfaces (re-roofing)

- 8.1 Storage and handling of roll roofing materials, as above in Section 07 00 00.6.
- 8.2 Installation

- 8.2.1 Confirm the structural capacity of the existing roof to bear the added weight of new roof components and construction activities
- 8.2.2 Specify repair or replacement of unsuitable areas
- 8.2.3 Confirm that components (chemical or material) of existing roof assembly are not incompatible or detrimental to the new roofing materials.
- 8.2.4 Confirm that the height, profile and clearances of existing parapets, scuppers, penetrations, curbs, as well as high wall to low roof flashing, cladding, door sills and window sills are sufficient to accommodate new roofing requirements.
- 8.2.5 The substrate of the existing roof should be structurally sound, smooth, flat, clean, dry, free of splinters and sharp edges. Ballast should be removed to a smooth surface.
- 8.2.6 Adequate measures to be taken to investigate the existing roof system for excess moisture build-up.
 - 8.2.6.1 If moist areas are discovered, specify remedial action to be taken before new re-roofing work begins.
- 8.2.7 Follow manufacturer's recommendations regarding primer, vapour barriers, rigid insulation and/or protective cover board material to be placed over the existing prepared substrate.
- 8.2.8 Follow manufacturer's recommendations for multiple-ply or single-ply re-roofing.
- 8.2.9 Provide an additional layer of membrane beneath traffic pavers and mount pavers as recommended by manufacturer.
- 8.2.10 Protect finished sections of roof from later construction activities.

Section 07 10 00 Damp-proofing and Waterproofing

1 Waterproofing, Extended Warranty:

- 1.1 Project manual to specify requirement of a system warranty for all waterproofing for a period of one (1) year beyond the date of expiration of performance assurance requirements specified in the General Conditions.
- 1.2 Replacement shall include, where applicable, removal of covering materials, reinstating them in new condition, repair and making good of displaced and adjacent Work damaged

during replacement, as well as, replacement of the waterproofing material. As a minimum, definition of defective work will include, but not be limited to, leaking where water enters the building through faults in the waterproofing materials or in their bond to waterproofed surfaces.

2 Materials

2.1 Sheet waterproofing

2.1.1 Asphalt

2.1.1.1 To requirements of CAN/CGSB 37.2-M88 for application and curing at temperatures recommended by manufacturers.

2.1.1.2 To requirements of CGSB 37-GP-9MA for application and curing at temperatures recommended by manufacturers.

2.1.2 Asphalt Primer

2.1.2.1 To CGSB 37-GP-2M and CGSB 37-GP-9MA, as applicable

2.1.3 Reinforcing Fabric

2.1.3.1 To CGSB 37-GP-63M synthetic resin or asphalt bonded type.

2.1.4 Sealing Compound

2.1.4.1 Rubber Asphalt to CAN/CGSB 37.29-M89

2.1.5 Protection Board

2.1.5.1 See DC-350, Part 1, Section 2, Division 7, 07 20 00 - Thermal Protection; Protective Coverboard

2.2 Elastomeric Roof Coating

2.2.1 Where an elastomeric roof coating is incorporated into the design, refer to latest edition of NMS document Section 07 18 00 - Traffic Coatings as appropriate to the project.

2.2.2 Make provision for quality control of coating application by specifying work be executed by a firm of specialists in the type of work, and who are acceptable to, and trained by, the roofing material manufacturer. Additionally, make provision that roofing material manufacturer's representative approve, by on-site visits, means and methods carried out by roofing contractor.

Section 07 20 00 Thermal Protection

1 General

- 1.1 CFC free.
- 1.2 Provide insulation to completely enclose the building envelope structure.
- 1.3 Place the warm side of the insulation in direct contact with the air/vapour barrier.
- 1.4 Incorporate perimeter foundation insulation into design
 - 1.4.1 Insulation to a depth of 600mm below bottom of finish grade on inside face of perimeter foundation walls.
 - 1.4.2 Insulation to 600mm in from perimeter foundation wall under slabs on grade.
 - 1.4.3 Where in-floor radiant heating is specified ensure floor slab is fully insulated to meet requirements of heating system. Coordinate with Mechanical.
 - 1.4.4 Ensure foundation insulation is R- value 10 aged 5 years expanded polystyrene type 2 or extruded polystyrene type 4.
- 1.5 Where cavity wall insulation is incorporated into design:
 - 1.5.1 Provide polystyrene, R Value 15 aged 5 years to meet CAN/ULC S770-15 Standard Test Method.
 - 1.5.2 Ensure insulation held in place by mechanical fasteners (Wedge-Lok type) at 400mm x 400mm.
- 1.6 Where tapered roofing insulation is incorporated into design:
 - 1.6.1 Make provision for custom designed tapered insulation providing a slope of 2%. Taper insulation to drain, ensuring an average R-30 is maintained and minimums as stated below.
- 1.7 Insulation Value
 - 1.7.1 Acceptable values for insulation thermal resistance per inch:
 - 1.7.1.1 Are those specified in the National Research Council's NRC-CNRC Registry of Product Evaluations (latest edition) and all current published amendments.

1.7.1.2 Provide, to DTIR representative, verification of the NRC evaluation listings of wall and roof insulations used on the project.

1.7.2 Polystyrene Insulation:

1.7.2.1 Where polystyrene is incorporated, for most roofing projects, Type 1 CAN/ULC S701-11 meets requirements for compressive strength. Review such need prior to specifying in Project Manual.

1.7.3 Polyisocyanurate Insulation

1.7.3.1 To CAN/ULC S704-11

1.7.3.2 Where polyisocyanurate insulation is incorporated, the acceptable thermal resistance values per inch of thickness is R5.56 per one inch thickness.

1.7.4 Ensure provision, except where noted otherwise, of the following minimum R-values:

1.7.4.1 For Walls, including Cavity Walls, R15

1.7.4.2 For Roofs, average R30

1.7.4.3 For Interior face of Foundation Walls and under slabs on grade R10

1.7.4.4 R values listed in the DC350 are provided as a guideline and minimum requirement only. It remains the responsibility of the consultant to design the envelope, including insulation values to meet the current Nova Scotia Climate Change Action Plan and LEED performance requirements.

1.7.5 Provide a flame spread rating of less than 25 for Cavity wall insulation.

1.7.6 Ensure the Contractor provides verification of the NRC evaluation listings from the manufacturer of the specific wall and roof insulations used on the project.

2 Materials

2.1 Protective Coverboard:

2.1.1 In Roofing Applications

2.1.1.1 Over rigid roof insulation, and prior to roof membrane installation, provide a protective coverboard. 1 layer minimum thickness 12.7mm, fully adhered or mechanically fastened to deck. Thickness to meet

applicable manufacturer's recommendations for warranty requirements.
Where 2 layers required, stagger joints between each layer by half panel.

2.1.1.2 Mechanically fastened design to be detailed to include fastener pattern to meet CSA A123.21-14 screws and plates approval. Screws and plate to meet ULC label, where required by code.

2.1.1.3 Rigid 1" mineral wool insulation board CAN/CGSB 51.31-M84 (Thermal Insulation, Mineral Fibre Board for Above Roof Decks) actual density of 11 lb/ft³ top surface coated with bitumen.

2.2 Acoustic Insulation for Steel Decks:

2.2.1 Fibrous glass insulation, 15.5 kg/m³ density profiled to suit deck flutes.

2.3 Batt Insulation

2.3.1 Glass Fibre Batts: To meet CAN/ULC-S702-14, Type IA

2.3.2 Mineral Wool Batts: To ASTM C612-14, Class 1

3 Installation

3.1 Batt Insulation Installation

3.1.1 Ensure insulation is supported to prevent settlement.

3.1.2 Install friction fit batts snugly between framing members.

3.1.3 Fit batt insulation snugly and without compression into every void to ensure full thickness for full length of construction.

3.1.4 Install to meet ASTM C1320-10(2016).

3.2 Cavity Wall Insulation Installation

3.2.1 Secure cavity wall insulation to substrate by wedging fasteners between masonry ties and insulation.

3.3 Adhesive installation of Insulation on Foundation Walls

3.3.1 Secure installation by adhesive.

3.3.2 Prime surfaces before application of adhesive as recommended by adhesive manufacturer.

3.3.3 Position and press boards into full contact with adhesive, and temporarily hold them in place until adhesive has set.

3.3.4 Ensure that backfilling is completed with 24 hours, and that it does not dislodge or damage insulation.

3.4 Insulation for Precast Architectural Concrete

3.4.1 Where steel stud back-up walls are required in the design for Precast Architectural Concrete, refer to DC350, Part 1, Section 2:

3.4.1.1 Division 03 for Precast Architectural Concrete

3.4.1.2 Division 07 for Vapour Barrier

3.4.1.3 Division 09, for stud back-up

3.4.1.4 Ensure assembly design provides for a minimum 25mm rigid, ship lapped edged, polystyrene insulated sheathing on the exterior and fibreglass batt insulation between the studs.

Section 07 24 00 Exterior Insulation and Finish System (EIFS)

- 1 Cement board with synthetic stucco finish at wall locations higher than 12 feet above finished grade is an acceptable material for exterior walls.
- 2 Where the system forms part of a cavity wall system, ensure exterior wall design utilizes the “rain screen” principle.

Section 07 25 00 Weather Barriers / Vapour Retarders / Air Barriers

- 1 Materials, include but are not limited to:
 - 1.1 Sheet Vapour Barrier
 - 1.1.1 Polyethylene Film, to CAN/CGSB 51.34-M86, 6 mil thick.
 - 1.2 Membrane Air Barrier & Flexible Membrane Flashing
 - 1.2.1 SBS modified bituminous air barrier membrane, minimum 40 mil thick.
 - 1.2.2 Brick ties and other penetrations should be sealed with mastic.

1.3 Cold Applied Roofing System Vapour Barriers

1.3.1 Self adhesive, modified bitumen vapour barrier, minimum 95 gram

- 2 Air barriers are to resist air pressure differences of not more than 0.1 L/S per m² at 75 Pa.
- 3 Place air/vapour barrier on the warm side of the insulation.
- 4 Air barrier to be capable of maintaining its continuity and contact with the insulation under all expected loading conditions.
- 5 Prepare large scale details to show how air barrier continuity is maintained at window surrounds, roof and wall junctions, envelope penetrations and changes of substrate materials.
- 6 Clearly define the roles and procedures for the installation of the air barrier amongst the various trades. Drawings to contain specific reference to the air barrier element in each section of the envelope.
- 7 Design to incorporate vapour barrier such that moisture in the wall is on the cold side of the vapour barrier and that the moisture can dissipate to the outside atmosphere.

8 Sheet Vapour Barrier Installation

- 8.1 Install sheet vapour barrier on warm side of exterior wall and ceiling assemblies prior to installation of gypsum board to form continuous barrier.
- 8.2 Use sheets of largest practical size to minimize joints.
- 8.3 Inspect sheet for continuity. Repair punctures and tears with sealing tape before work is concealed.

8.4 Exterior Surface Openings

8.4.1 Cut sheet vapour barrier to form openings and ensure material is lapped and sealed to door and window frames.

8.4.2 Lap and seal air barrier membrane over vapour barrier at openings to provide continuity.

8.5 Perimeter Seals

8.5.1 Seal perimeter of sheet vapour barrier as follows

8.5.1.1 Apply continuous bead of sealant to substrate at perimeter of sheets.

8.5.1.2 Lap sheet over sealant and press into sealant bead.

8.5.1.3 No gaps to exist in the sealant bead. Smooth out folds and ripples occurring in the sheet over the sealant.

8.6 Lap Joint Seals

8.6.1 Seal lap joints of sheet vapour barrier as follows:

8.6.1.1 Attach first sheet to substrate.

8.6.1.2 Apply continuous bead of sealant over solid backing at joint.

8.6.1.3 Lap adjoining sheet minimum 150 mm and press into sealant bead.

8.6.1.4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring over sealant.

8.7 Penetrations

8.7.1 Seal vapour barrier penetrations, including electrical switches and outlet device boxes as follows:

8.7.1.1 For sheet type vapour barriers, install purpose-made molded box vapour barrier.

8.7.1.2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box.

8.7.1.3 Prime all surfaces for adhesion as recommended by manufacturer.

9 Air Barrier Installation

9.1 Apply air barrier membrane to the exterior surface of concrete block, plywood, exterior grade drywall, and continuous across changes in substrate materials (i.e. Block to steel, block to plywood, window and door openings.)

9.2 Roll completely after each sheet is applied.

9.3 Apply in strict accordance with manufacturer's printed instructions.

9.4 Prime substrate as per manufacturer's recommendations for the intended application.

9.5 Side laps to be a minimum of 50 mm and end laps are a minimum of 150 mm.

9.6 Maintain continuity of the air barrier from walls to the roof as indicated.

- 9.7 Lap air barrier with vapour barrier at all window and door openings, in accordance with CSA A440.4:19 rain screen methods.
- 9.8 Connect air barrier to window frames and door frames to provide air tight seals.
 - 9.8.1 Line the head, sill and jambs of the window rough opening with 19mm plywood to run from the line of wall air /vapour barrier to the inside face of the wall.
 - 9.8.2 Apply self adhesive /air vapour barrier, minimum 40mil thick, to full width of the plywood and lap membrane onto the wall air vapour barrier.
 - 9.8.3 Install the window as per CSA A440.4 and the manufacturer's printed instructions.
 - 9.8.4 Apply self adhesive membrane to seal from the back side of the frame to the membrane installed on the plywood. Membrane must have a minimum 12mm contact onto window frame metal and a contact width on the rough opening membrane of at least 38 mm.
 - 9.8.5 Membrane must be carefully fitted at corners so there are no pin holes.
 - 9.8.6 Secure the membrane seal with continuous aluminum angle which covers the full width of membrane contact on the frame and rough opening. Thickness of metal in the angle to be 2mm. Secure the aluminum angle with screws at 200mm c/c in both legs.
 - 9.8.7 Spray foam insulate the space between the frame and the rough opening from the exterior.
 - 9.8.8 Install an exterior break metal sill to fit in under the metal sill of the window frame. Return the front edge of the sill a minimum of 50mm down the face of the wall and secure with a continuous cleat.
 - 9.8.9 Carefully caulk the space between the frame and the building opening and between the frame and the metal sill.
- 9.9 Proper detailing of any areas which do not allow for easy installation of the sheet membrane.
- 9.10 Continuity of air barrier to be achieved by lapping spray-on and roll-on membrane air barriers.
- 9.11 Use air barrier membrane for flexible through wall flashing in masonry walls and where indicated.

9.11.1 Masonry Thru Wall Flashing (Self Adhering): SBS Modified bitumen, self adhering sheet membrane complete with a cross laminated polyethylene film having the following properties:

9.11.1.1 Thickness: 1mm (40 mils) minimum

9.11.1.2 Film thickness 0.225 mm (9.0 mils)

9.11.1.3 Tensile strength (film): 34,500 kPa (500 psi)

9.11.2 Standard of Acceptance: Blueskin TWF by Bakor, or Perm-A-Barrier by Grace Membrane Systems.

10 Vapour for Precast Architectural Concrete

10.1 Where steel stud back-up walls are required in the design for Precast Architectural Concrete, refer to DC350, Part 1, Section 2,:

10.1.1 Division 03 for Precast Architectural Concrete

10.1.2 Division 07 for Insulation

10.1.3 Division 09, for stud back-up

10.1.4 Ensure assembly design provides for a 6mil polyethylene vapour barrier.

11 Design and locate air/vapour barrier for overhangs and hidden spaces in envelope so that condensation will not occur in these spaces. Consider air/vapour barrier continuity and buildability, insulation location, thermal bridging and air circulation in order to determine if space will perform better as cold exterior or warm interior space.

Section 07 30 00 Steep Slope Roofing (Shingles, Roof Tiles, and Roof Coverings)

- 1 When the Department expresses its preference to use a modified bitumen roofing membrane on a specific project and the Consultant wishes to propose use of an Asphalt Shingle Roofing System, be prepared to demonstrate such use meets or exceeds the requirements for the modified bitumen system.
- 2 Specify shingles having a 30 year warranty.
- 3 Eave protection membrane to extend a minimum of 900mm, measured horizontally, beyond inside face of exterior walls.

- 4 Provide ice and water protection membrane on roof valleys a minimum dimension of 900mm both sides.

Section 07 40 00 Roofing and Siding Panels

1. Preformed Metal Cladding/Siding
 - 1.1. Metal cladding panels and metal siding (minimum 24 gauge) for walls higher than 4m above finished grade are acceptable materials for exterior walls. Should such cladding be proposed, demonstrate that these systems meet or exceed requirements of the specified masonry system.
2. Discuss use of metal cladding lower than 4m above ground level with the DTIR project leader. Receive DTIR approval prior to incorporation into the design.
3. Control snow and ice from sloped roofs.

Section 07 51 00 Four Ply Built Up Roofing (BUR)

- 1 Materials
 - 1.1 Drywall: ½" Exterior grade non paper backed utility board, or rigid 1" mineral wool insulation board CAN/CGSB 51.31-M84, actual density of 11 lb/ft³ top surface coated with bitumen.
 - 1.2 Asphalt Primer: To CGSB 37
 - 1.3 Asphalt: Type II and Type III in compliance with CSA A123.
 - 1.4 Asphalt Felts: No. 15 perforated asphalt felts or Type IV fibreglass felts.
 - 1.5 Insulation: To Part 1, Section 2, Division 07, item 07 20 00 Thermal Protection.
 - 1.6 Protective Coverboard
 - 1.6.1 To Part 1, Section 2, Division 07, item 07 20 00 Thermal Protection.
 - 1.6.2 Fire rated boards to be incorporated as required to meet code requirements.
 - 1.7 Modified Bituminous Flashing

1.7.1 Base Flashing

1.7.1.1 Non-woven polyester reinforcement with thermofusible elastomeric asphalt.

1.7.2 Cap Flashing

1.7.2.1 Modified Bitumen membrane

1.7.2.1.1 Underside: thermofused plastic film

1.7.2.1.2 Top face: coloured granules

2 Where Built-up Bituminous Roofing is incorporated into design:

2.1 Provide 4 ply felts to CRCA standards c/w thermal barrier, vapour barrier, insulation, pea gravel, top covering and modified bituminous flashing

2.1.1 Apply such that application meets or exceeds CSA A123.21-14 wind uplift requirements. Design for a higher FM wind uplift where required.

2.1.2 If mechanically fastened in areas of exposed ceiling, fasteners within flutes to be cut to 25mm and capped.

2.1.3 Provide design details of Modified Bitumen Flashing.

2.2 Where roofing is applied over metal deck, provide exterior grade drywall on metal deck prior to vapour barrier installation.

Section 07 52 00 Modified Bituminous Membrane Roofing

1 When membrane is torch applied, make provision that the contractor maintains a fire watch for 1 hour after each days roofing operations cease and that heat sensor unit is used to detect hot spots.

2 Make provision for quality control of membrane application by specifying work be executed by a firm of specialists in the type of work, and who are acceptable to, and trained by, the roofing material manufacturer. Additionally, make provision that roofing material manufacturer's representative approve, by on-site visits, means and methods carried out by roofing contractor.

3 Materials:

3.1 Base Sheet

- 3.1.1 Reinforcement: non-woven polyester 180 g/M²
- 3.1.2 Elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer.
- 3.1.3 Minimum thickness 2mm.
- 3.2 Base Flashing:
 - 3.2.1 Have a non-woven polyester reinforcement and SBS thermofusible elastomeric asphalt.
 - 3.2.2 Reinforcement: non-woven polyester, 180 g/M².
 - 3.2.3 Thermofusible elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer.
 - 3.2.4 Minimum thickness 2.8 mm.
- 3.3 Cap Sheet and Cap Sheet Flashing.
 - 3.3.1 Shall have a non-woven polyester reinforcement and SBS thermofusible elastomeric asphalt.
 - 3.3.2 Reinforcement: 250 g/M² of non-woven polyester.
 - 3.3.3 Elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer.
 - 3.3.4 Minimum thickness 3.8 mm.
 - 3.3.5 combined thickness of base sheet and cap sheet must be a minimum of 6mm.
 - 3.3.6 Cap face protection: ceramic granules, colour from Manufacturer's standard selection.
- 3.4 Expansion joint membrane:
 - 3.4.1 Elastomeric modified bitumen waterproofing membrane.
 - 3.4.2 Reinforcing: polyester tissue.
 - 3.4.3 Minimum thickness 3.8 mm.
 - 3.4.4 Minimum width 500mm.

- 4 Provide membrane complete with thermal separator, vapour barrier and insulation.
- 5 Provide a second layer of protective board or cap sheet and mount pavers around roof top units as a walkway.
- 6 Apply such that application meets or exceeds minimum CSA A123.21-14 wind uplift requirements. Use higher FM wind uplift requirements where required by regional climatic data.
- 7 If mechanically fastened or fully adhered in areas of exposed ceiling, fasteners between flutes of deck to be cut to 25mm and capped.
- 8 Detail flashing and counter flashing.
- 9 Vapour barrier of 2 ply felt and asphalt. Refer to Part 1 Section 2, 07 25 00 Weather Barriers / Vapour Retarders / Air Barriers.
- 10 Co-ordinate insulation placement to acoustic deck, where acoustic deck is incorporated into design.
- 11 Where roofing is applied over metal deck, provide exterior grade non-paper backed drywall or rigid 1" mineral wool insulation board CAN/CGSB 51.31-M84 actual density of 11 lbs/cuft top surface coated with bitumen on metal deck prior to vapour barrier installation.
- 12 Use tape guard, with a minimum 75 mm overlap, at roof penetrations and curbs to ensure torch flame does not reach combustible surfaces.
- 13 Multiple-ply cold applied modified bitumen roofing
 - 13.1 Standard of Acceptance:
 - 13.1.1 IKO "Modiflex 180 FS" system, base and cap, w/ adhesive to ASTM D3019/D3019M-17, Type III or CGSB 37-GP-14M
 - 13.1.2 Bakor "SA Cap Modified Plus" cap, "Bluebase" base, w/ adhesive Thermostik 840- 10
 - 13.1.3 Tremco "Burmastic" Cold Built-up Roof System with multiple layers of membrane (Ply sheets, PowerPly Base Plies, and PowerPly MB Cap sheet w/ SF BURmastic adhesive.
 - 13.1.4 Approved alternative: Alternatives may be proposed by the consultant and subsequently approved following a comparative review of

performance characteristics.

13.2 Warranties to meet the requirements of Section 07 00 00.3, DC350, current edition.

13.3 Installation

13.3.1 Follow manufacturer's instructions regarding use of vapour barrier, primer, base sheet material, and rigid insulation as appropriate to the roof deck construction.

13.3.2 Surface to be clean and dry and free of all ice, water, and debris.

13.3.3 Install only when air temperature is within manufacturer's recommended tolerances.

13.3.4 Adhere or mechanically fasten rigid insulation to substrate, and adhere protective cover board to top of insulation.

13.3.5 Following manufacturer's instructions regarding roof penetrations, end and side overlaps, flashing, parapet and trim detailing.

13.3.6 Provide a double layer of cap sheet and mount pavers or a second layer of protective board at roof traffic pavers as recommended by manufacturer.

13.3.7 Protect areas of roof which are finished from later construction activity.

Section 07 53 00 Elastomeric Membrane Roofing -Ethylene Propylene Diene Monomer Roofing (EPDM)

- 1 When the Department expresses its preference to use a modified bitumen roofing membrane on a specific project and the Consultant wishes to propose use of an Ethylene Propylene Diene Monomer (EPDM) Roofing System, be prepared to demonstrate such use meets or exceeds the requirements for the modified bitumen system.
- 2 Where Ethylene Propylene Diene Monomer (EPDM) roofing is incorporated into design use a non- ballasted, fully adhered or mechanically fastened method of attachment.
- 3 Where roofing is applied over metal deck, provide exterior grade non-paper backed drywall, or rigid 1" mineral wool insulation board CAN/CGSB 51.31-M84 actual density of 11 lbs/cuft top surface coated with bitumen on metal deck prior to vapour barrier installation.

4 Cold applied single-ply EPDM

4.1 Standard of Acceptance:

4.1.1 Firestone “Rubbergard Max reinforced”

4.1.2 Carlisle “Sure-Seal” or “Fleeceback”

4.1.3 Approved alternative: Alternatives may be proposed by the consultant and subsequently approved following a comparative review of performance characteristics.

4.2 Warranties to meet the requirements of Section 07 00 00.3, DC350, current edition.

4.3 Installation

4.3.1 Follow manufacturer’s instructions regarding use of vapour barrier, primer, membrane material, and rigid insulation as appropriate to the roof deck construction.

4.3.2 Surface to be clean and dry and free of all ice, water, and debris.

4.3.3 Install only when air temperature is within manufacturer’s recommended tolerances.

4.3.4 Adhere or mechanically fasten rigid insulation to the substrate, and adhere protective cover board to top of insulation.

4.3.5 Adhere or mechanically fasten membrane in conformance with manufacturer’s instructions for all work, including roof penetrations, end and side overlaps, flashing, parapet and trim detailing.

4.3.6 Use pre-moulded flashing at roof penetrations, as recommended by manufacturer.

4.3.7 Provide a double layer of membrane cap sheet or protection board at roof traffic pavers and mount pavers, as recommended by manufacturer.

4.3.8 Protect areas of roof which are finished from later construction activity.

Section 07 54 00 Thermoplastic Membrane Roofing

1 Where Thermoplastic Membrane roofing (including but not limited to TPO roofing) is

incorporated into design use mechanically fastened or fully adhered method of attachment.

- 2 Where roofing is applied over metal deck, provide exterior grade non-paper backed drywall or rigid 1" mineral wool insulation board CAN/CGSB-51.31-M84 actual density of 11 lbs/cuft top surface coated with bitumen on metal deck prior to vapour barrier installation and 1 layer of protective coverboard, over insulation. See Section 07 20 00 Thermal Protection, Materials, Protective Coverboard

Section 07 70 00 Roof and Wall Specialties and Accessories

- 1 Curbs to be minimum 300 mm (12") above drainage plane to top. Detail all penetrations.
- 2 Where roofing is sloped less than 1:3, provide inserts/slots for the purpose of retaining temporary guard rails (minimum of 42" high), for use during construction and maintenance work.
- 3 Fall Protection Systems
 - 3.1 Travel Restraint Systems
 - 3.1.1 Include Travel Restraint Systems in design of new flat-roof assemblies, and where major re-roofing of flat-roofs are performed on existing buildings, except where otherwise specified.
 - 3.1.2 Ensure submission of shop drawings for Travel Restraint System in accordance with the General Conditions of Contract. Ensure shop drawing indicate materials, thicknesses, finishes, connections, joints, and methods of anchorage, number of anchors, supports, reinforcement, details and accessories.
 - 3.1.3 Ensure submission of erection drawings as for shop drawing in accordance with General Conditions indicating location for placement.
 - 3.1.4 Ensure coordination of travel restraint design with structural design in new buildings and particularly in existing buildings, where structure may require upgrades to support the travel restraint system. Discuss with DTIR staff.
 - 3.2 Other Fall Protection Systems
 - 3.2.1 Discuss other fall protection systems with DTIR staff, where building use or maintenance may necessitate such systems.
 - 3.3 Material

3.3.1 Type permanently secured, by bolts or weld, to the building structure and meeting requirements of the Province of Nova Scotia Fall Arrest Legislation and Occupational Health and Safety Act revised Statutes of Nova Scotia 1996, Chapter 7 and regulations; c/w associated fasteners, bolts and cable.

3.4 Execution

3.4.1 Ensure system is installed to manufacturer's printed instructions, and is project specific.

3.4.2 Ensure the system is installed prior to other work on the roof commences.

3.4.3 Ensure the manufacturer's representative inspects and approves, in writing, system installation prior to any use or concealing of work.

3.4.4 Ensure the contractor provides the Consultant a copy of manufacturer's inspection, including load test on each anchor, and approval of installation.

3.4.5 Review the manufacturer representative's inspection and approval documentation. Where such documentation is satisfactory, direct the contractor to proceed with Work.

3.4.6 Ensure the Contractor does not conceal travel restraint work without Consultant's direction.

Section 07 80 00 Fire and Smoke Protection

- 1 Where fire separations are required between assemblies, including floors and rooms, provide a written description of the entire systems being used to achieve fire separations with appropriate ULC number.
- 2 Show on drawings locations, extent and ratings of fire separations and protections.

Section 07 84 00 Firestopping

1 Materials

1.1 Fire stopping and Smoke seal systems

1.1.1 Intumescent type in accordance with CAN/ULC-S115-11

- 1.1.2 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC-S115-11 and not to exceed opening sizes for which they are intended.
- 1.2 Service penetration assemblies
 - 1.2.1 Certified by ULC in accordance with CAN/ULC-S115-11 and listed in the ULC Guide No. 40 U19
- 1.3 Service penetration fire stop components
 - 1.3.1 Certified by ULC in accordance with CAN/ULC-S115-11 and listed in the ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.
- 1.4 Fire stopping at openings intended for ease of re-entry such as cables:
 - 1.4.1 Elastomeric seal; do not use cementitious or rigid seal at such locations.
- 1.5 Fire stopping at openings around penetrations for pipes, duct work and other mechanical items requiring sound and vibration control:
 - 1.5.1 Elastomeric seal; do not use cementitious or rigid seal at such locations.
- 1.6 Primers
 - 1.6.1 To manufacturer's recommendations for specific material, substrate, and end use.
- 1.7 Water (where applicable)
 - 1.7.1 Potable, clean and free from injurious amounts of deleterious substances.
- 1.8 Damming and Back-Up Materials, Supports and Anchoring Devices
 - 1.8.1 To manufacturer's recommendations and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- 1.9 Sealants for vertical joints
 - 1.9.1 Non-sagging type.
- 2 Fire-resistance rating of installed fire stopping assembly not less than the fire-resistance rating of the surrounding floor and wall assembly.
- 3 Where fire separations are required between assemblies, including floors and rooms, provide a written description of the entire systems being used to achieve fire separations with

appropriate ULC number.

4 Preparation

- 4.1 Examine sizes and conditions of voids to be filled to establish correct thickness and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
- 4.2 Prepare surfaces in contact with fire stopping materials to manufacturer's printed instructions.
- 4.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- 4.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

5 Installation

- 5.1 Install fire stopping material and components in accordance with ULC standard systems certification and Manufacturer's printed instructions.
- 5.2 Seal holes or voids made by through-penetrations, poke-through termination devices, and openings or joints to ensure continuity and integrity of fire separation are maintained.
- 5.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- 5.4 Tool and trowel exposed surfaces to a neat finish.
- 5.5 Remove excess compound promptly as work progresses and upon completion.

Section 07 90 00 Joint Protection

- 1 Contractors to submit manufacturers' warranties for the work of this section covering a period of four (4) years beyond the date of expiration of performance assurance.
- 2 Defective work shall include, but not be restricted to, joint leakage, cracking, crumbling, melting, running, loss of adhesion, loss of cohesion, or staining of adjoining or adjacent work or surfaces. All old or defective caulking shall be removed and surfaces cleaned before installation of caulking.
- 3 Acrylic base solvent curing, one component Sealing compound for glass, metal, masonry or wood shall be specified to meet the requirements of CGSB 19-GP-5M.

- 4 For indoor use in occupied buildings consider the use of one component acrylic emulsion latex water based sealing compound where the application is appropriate, for metal, concrete, masonry and glass and specified to meet the requirements of CAN/CGSB 19.17-M90 or ASTM C834-17.
- 5 Elastomeric chemical curing one component sealing compound for metal, concrete, masonry and glass shall be specified to meet the requirements of CAN/CGSB 19.13-M87.
- 6 Multi-component chemical curing sealing compounds shall be specified to meet the requirements of CAN/CGSB 19.24 M .
- 7 The sealant for all joints and around all penetrations in slab-on -grade shall be a one-component high performance, polyurethane product installed to manufacturer's specifications.

END