

**General****1.1 SECTION INCLUDES**

- .1 Materials and installation for SBS modified bituminous roofing system including roof curbs, pads, flashings and walkways for a Partially Adhered Roofing System (PARS).
- .2 System Description:
  - .1 Substrate.
  - .2 Self-adhered vapour retarder.
  - .3 Base polyisocyanurate insulation (mechanically fastened).
  - .4 Tapered polyisocyanurate insulation (adhered).
  - .5 Coverboard (adhered).
  - .6 2 plies of SBS modified bitumen membrane.
- .3 System Description:
  - .1 Substrate.
  - .2 Self-adhered vapour retarder.
  - .3 Base polyisocyanurate insulation (pre-secured).
  - .4 Tapered polyisocyanurate insulation (pre-secured).
  - .5 Coverboard (mechanically fastened).
  - .6 2 plies of SBS modified bitumen membrane (heat welded)

**1.2 RELATED REQUIREMENTS**

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 92 00 – Sheet Metal Flashing and Trim

**1.3 REFERENCE STANDARDS**

- .1 ASTM C1177/C1177M-17, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .2 CRCA Roofing Specifications Manual - current version at time of Building Permit.
- .3 CSA A123.3-05 (R2015), Asphalt Saturated Organic Roofing Felts.
- .4 CSA A123.21-20, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems
- .5 CSA A123.23-15 (R2020), Product specification for polymer-modified bitumen sheet, prefabricated and reinforced.
- .6 FM Approvals - Roofing Products.
- .7 Material Safety Data Sheets (MSDS).
- .8 CAN/ULC S107-10, Method of Fire Tests of Roof Coverings.
- .9 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

- .10 CAN/ULC-S702.1-2014-AMD1, Standard for Mineral Fibre Thermal Insulation for Buildings.
- .11 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .12 CAN/ULC-S770-15- Standard Test Method for Determination of Long-term Thermal Resistance of Closed-Cell Thermal Insulating Foams.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Convene pre-installation meeting four weeks prior to beginning waterproofing Work, with [DCC Representative] [roofing contractor's representative] [Departmental Representative] [Consultant] 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 SUBMITTALS**

- .1 Provide submittals in accordance with Section [01 33 00- Submittal Procedures].
- .2 Product Data:
  - .1 Provide most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Provide WHMIS MSDS and indicate VOC content for:
    - .1 Primers.
    - .2 Sealers.
- .3 Provide shop drawings:
  - .1 Indicate fastening pattern for Field, Perimeter Zone and Corner Zone.
  - .2 Indicate [control joints,] [flashing,] [tapered insulation] details.
  - .3 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 [bitumens] [membrane] [roofing felts] with specification requirements.
- .6 Manufacturer's Installation Instructions: indicate special precautions required for seaming membrane.
- .7 Manufacturer's field report: in accordance with Section 01 45 00- Quality Control.
- .8 Installer's proof of manufacturer's required training program and registration.
- .9 Reports: indicate procedures followed, ambient temperatures and wind velocity during application.
- .10 Warranty: submit sample warranty documents meeting specified warranty requirements.

- .11 Sustainability Submittals:
  - .1 EPD's in accordance with ISO 14025 and rely on Life Cycle Assessment (LCA) as follows:
    - .1 SBS-Modified Bitumen Roofing Membrane: Cold Adhesive
    - .2 SBS-Modified Bitumen Roofing Membrane: Hot Asphalt
    - .3 SBS-Modified Bitumen Roofing Membrane: Torch Applied
    - .4 SBS-Modified Bitumen Roofing Membrane: Self Adhered

## 1.6 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with minimum five (5) years documented experience.
- .2 Installer qualifications: IKO MODBIT/BUR Registered Applicator (IAAP).
- .3 Qualification of Workers: Employ skilled applicators certified by Provincial Apprenticeship Board as being 'enrolled in' or 'having completed' appropriate training of installation of modified bituminous membrane roofing.
- .4 Roofing inspections:
  - .1 3<sup>rd</sup> party inspections; paid for by [Work of this section [Owner] to satisfy conditions of 3<sup>rd</sup> Party Guaranties.

## 1.7 FIRE PROTECTION

- .1 Fire Extinguishers:
  - .1 Maintain one stored pressure rechargeable type with hose and shut-off nozzle,
  - .2 ULC labelled for A, B and C class protection.
  - .3 Size[s] [1.14] [4.5] [9] [14] [2.25] kg [or as indicated] on roof per torch applicator, within 6 m 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.
- .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 roll material 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 weather and deleterious materials.
- .3 Waste Management: in accordance with Section 01 74 19- Waste Management and Disposal. Return surplus materials to manufacturer whenever possible

## **1.9 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 In strict compliance with manufacturer's requirements.
  - .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 IKO Diamond Shield [10] [15] [20] Year Warranty.
  - .1 Warranty to include coverage for labour and materials required to complete repair or replacement of material found to have a manufacturing defect or workmanship to install membrane resulting in roof leaks
  - .2 Provide cost of premium for warranty.
- .2 IKO Limited Labour and Membrane [10] [15] [20] Year Warranty.
  - .1 Warranty to include coverage for labour and materials required to complete repair or replacement of material found to have a manufacturing defect resulting in roof leaks.

## **Part 2 Products**

### **2.1 MANUFACTURERS**

- .1 Acceptable Manufacturers of system materials:
  - .1 IKO Industries.

### **2.2 PERFORMANCE CRITERIA**

- .1 Roofing System: fastening pattern to CSA A123.21 for wind uplift resistance as follows:
  - .1 Field: [\_\_\_\_\_].
  - .2 Perimeter Zone: [\_\_\_\_\_].
  - .3 Corner Zone: [\_\_\_\_\_].
- .2 Fire performance to CAN/ULC S107: Class [A] [C].

### **2.3 DECK OVERLAY BOARD**

- .1 Glass Mat, Gypsum Board: to ASTM C1177, thickness as indicated on drawings.

### **2.4 VAPOUR RETARDER AND PRIMER**

- .1 Self-adhesive applied vapour retarder: non-woven glass fiber mat permeated with SBS modified bitumen.
  - .1 Acceptable Materials:

- .1 MVP Sand.
- .2 Heat welded vapour retarder:
  - .1 Acceptable Materials:
    - .1 Torchflex TF-95-SF-Base; to CSA A123.23-15, Type A, Grade 3.
- .3 Primer/adhesive: self-adhering membrane adhesive.
  - .1 Acceptable Materials:
    - .1 S.A.M. Adhesive.

## 2.5 MEMBRANE MATERIALS

- .1 Cap Sheet and cap sheet flashing: heat welded.
  - .1 ULC Fire Resistance: Class A.
  - .2 Properties: to CSA A123.23-15, Type B or C Grade 1, polyester reinforcement.
  - .3 Colour: to be selected by Consultant from manufacturer's standard range.
  - .4 Acceptable Materials:
    - .1 Prevent TP-250 Cap.
    - .2 Prevent TP-HD Cap.
- .2 Cap Sheet and cap sheet flashing: heat welded.
  - .1 ULC Fire Resistance: Class C.
  - .2 Colour: to be selected by Consultant from manufacturer's standard range.
  - .3 Acceptable Materials:
    - .1 Torchflex TP-180-Cap.
      - .1 Properties: to CSA A123.23-15, Type B Grade 1, non-woven polyester reinforcement mat strengthened with select glass fibre strands.
    - .2 Torchflex TP-250 Cap.
      - .1 Properties: to CSA A123.23-15, Type B Grade 1, non-woven polyester reinforcement mat strengthened with select glass fibre strands.
      - .2 Thickness: 4 mm.
    - .3 Torchflex TP-250 Cap (5.0).
      - .1 Properties: to CSA A123.23-15, Type B Grade 1, non-woven polyester reinforcement mat strengthened with select glass fibre strands.
      - .2 Thickness: 5 mm.
    - .4 Torchflex TP-HD-Cap.
      - .1 Properties: to CSA A123.23-15, Type C Grade 1, non-woven polyester reinforcement with glass fibre scrim in both machine and cross directions.
      - .2 Thickness: 4 mm.

- .5 ArmourCool Granular TP-HD.
  - .1 Properties: to CSA A123.23-15, Type C Grade 1, non-woven polyester reinforcement with glass fibre scrim in both machine and cross directions.
  - .2 SRI index: 82.
  - .3 Thickness: 5 mm.
- .3 Self-adhering Cap Sheet and Cap Sheet flashing:
  - .1 Acceptable Materials:
    - .1 ArmourStick HD-Cap peel and stick cap sheet.
      - .1 Properties: to CSA A123.23 Type C Grade 1 and ASTM 6162 Type I, Grade G.
      - .2 Thickness: 4.5 mm.
  - .2 ArmourStick HD-Base peel and stick base sheet; to CSA A123.23 Type C, Grade 3.
  - .3 Amourbond 180 self-adhering base sheet; to CSA A123.23-15, Type B Grade 3.
  - .4 Armourvent Base self-adhering base sheet; to CSA A123.23-15, Type A Grade 3.
- .4 Heat Welded Base Sheet:
  - .1 Torchflex TP-180-FF-Base: to CSA A123.23-15, Type B Grade 3.
  - .2 Torchflex HD-FF-Base, to CSA A123.23-15, Type C Grade 3.
- .5 Asphalt Adhered Base Sheet:
  - .1 Modiflex MP-180-FS-Base; to CSA A123.23-15, Type B Grade 3.
  - .2 Modiflex MP-180-SS-Base; to CSA A123.23-15, Type B Grade 3.
- .6 Self-Adhering Base Sheet Flashing:
  - .1 Properties: non-woven reinforced polyester mat strengthened with select glass fibre strands.
  - .2 Thickness: 2.5 mm.
  - .3 Acceptable Materials:
    - .1 Amourbond Flash.

## 2.6 GLASS FELT

- .1 Asphalt saturated Glass mat to CSA A123.17 and ASTM D2178 Type 6.
  - .1 Acceptable Materials:
    - .1 IKO Type 6 Glass Ply Sheet

## 2.7 COMPOSITE OVERLAY BOARD

- .1 Composite Cover Board: factory laminated base sheet membrane and cover board.
  - .1 Acceptable Materials:
    - .1 Protectobase 180.

**2.8 LAMINATED COVER BOARD**

- .1 High density polyisocyanurate insulation factory laminated to 180 weight polyester reinforced SBS modified bitumen base sheet; with dual selvage self-adhering edges.
  - .1 Acceptable Materials:
    - .1 SheildBase 180.

**2.9 INSULATION OVERLAY BOARD**

- .1 Mechanically fastened or adhered board with mineral-fortified asphaltic core and high-strength reinforcing glass fibre mat facers.
  - .1 Thickness: 4.8 mm (3/16”).
  - .2 Acceptable Materials:
    - .1 Protectoboard.
- .2 Rigid high compressive strength polyisocyanurate foam insulation with glass fiber facers:
  - .1 Acceptable Materials:
    - .1 IKOTherm CoverShield.

**2.10 POLYISOCYANURATE INSULATION**

- .1 To CAN/ULC-S704, Type 2 and ASTM C1289 Type II Class 2, Grade 2.
- .2 Long Term Thermal Resistance (LTTR): to CAN/ULC S770.
- .3 Equal Thickness material:
  - .1 Thickness as indicated on drawings.
  - .2 Acceptable Materials:
    - .1 IKOTherm III.
- .4 Tapered:
  - .1 Acceptable Materials:
    - .1 IKOTherm III Tapered.

**2.11 FASTENERS**

- .1 Manufacturer's required materials:
  - .1 Screws:
    - .1 #14 Phillips Head Dekfast DF-#14-PH3; SFS.
    - .2 #14 HD Roofing Fasteners; Trufast.
  - .2 Plates:
    - .1 Stress Plates:
      - .1 3” (76 mm) Round MP3000 Metal Insulation plates; Trufast.
      - .2 3” (76mm) Round PLT-R-3 plates; SFS.

**2.12 ADHESIVE**

- .1 Roof board and insulation adhesive: highly elastomeric, low rise foamable, solvent-free.

- .1 Acceptable Materials:
  - .1 IKO Millennium Adhesive.
- .2 Field adhesive; solvent-free, single component cold-applied interply adhesive for use on field membrane application.
  - .1 Acceptable Materials:
    - .1 Cold Gold Field Adhesive.
- .3 Flashing adhesive for steep slopes; solvent-free, single component, asphalt modified urethane adhesive for flashing membrane application
  - .1 Acceptable Materials:
    - .1 Cold Gold Flashing Adhesive.

## **2.13 ASPHALT**

- .1 Liquid or keg asphalt material to CSA A123.40-M, Type III.
  - .1 Acceptable Materials:
    - .1 Asphalt Type 3 – oxidized bitumen.

## **2.14 ACCESSORY MATERIALS**

- .1 Self-adhering membrane adhesive: quick-drying, solvent-based surface preparation.
  - .1 S.A.M. Adhesive.
- .2 Asphalt roofing primer:
  - .1 IKO Standard Asphalt Primer.
- .3 Mastic: modified asphalt sealant to ASTM D4586.
  - .1 AquaBarrier Mastic.
- .4 Mod-Bit Primer: solvent base primer.
  - .1 IKO Mod-Bit Primer.
- .5 Roofing Tapes;
  - .1 Fire resistant: inorganic reinforcing mat of high strength non-woven glass fibres.
    - .1 Modiflex Roof Tapes.
  - .2 SBS polymer glass fibre reinforced roofing tape:
    - .1 TorchTape 180 FF.
- .6 Liquid Waterproofing: solvent free, liquid applied membrane coating.
  - .1 MS Detail.

## **2.15 WALKWAYS**

- .1 Walkways to consist of one additional ply of cap sheet membrane. Colour to be different from field membrane as selected by [Departmental Representative] [DCC Representative] [Consultant].



**2.16 CARPENTRY**

- .1 Materials: refer to Section 06 10 00 Rough Carpentry.

**Part 3 Execution****3.1 QUALITY OF WORK**

- .1 Examine and prepare roofing Work in accordance with [CRCA Roofing Specification Manual] [Roofing Manufacturer's Specification Manual] [[\_\_\_\_\_] [Provincial]<options>Territorial</options> Roofing Association Manual] , particularly for fire safety precautions, and to [FM] [ULC] Design No. [\_\_\_\_\_] ]
- .2 Assembly, component and material connections will be made in consideration of appropriate design loads, with reversible mechanical attachments.

**3.2 EXAMINATION OF ROOF DECKS**

- .1 Verification of Conditions:
  - .1 Review with [Consultant] [DCC Representative] [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 [, slopped 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.
- .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] [DCC Representative] [Consultant].
- .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 PREPARATION OF STEEL DECK (CHANNEL TYPE)**

- .1 Install sound absorbing insulation in flutes of acoustical steel roof deck in accordance with deck manufacturer's instructions.

**3.5 DECK OVERLAY BOARD**

- .1 Mechanically fasten deck or adhere overlay to deck to pre-secure material prior to installation of vapour retarder.
- .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 roofing substrate at the rate recommended by manufacturer.

**3.7 VAPOUR RETARDER**

- .1 Lay material and secure to substrate in accordance with manufacturer's requirements.

**3.8 INSULATION APPLICATION**

- .1 Insulation: mechanically fastened application:
  - .1 Install in multiple layers of no more than [ ] mm per layer.
  - .2 Joint: staggered minimum 300 mm
  - .3 Mechanically fasten insulation using screws and pressure distribution plates to pre-secure prior to additional layers.
  - .4 Fasten insulation in accordance with manufacturer's written recommendations.
  - .5 Place boards in parallel rows with ends staggered, and in firm contact with one another.
  - .6 Cut end boards to suit.
- .2 Tapered insulation application:
  - .1 Install tapered insulation as [second] [first] insulation layer, in accordance with shop drawings. Stagger joints between layers 150 mm minimum.
- .3 Insulation: adhered application:
  - .1 Install in multiple layers of no more than [ ] mm per layer.
  - .2 Joint: staggered minimum 300 mm
  - .3 Apply adhesive in accordance with manufacturer's written recommendations.
  - .4 Place boards in parallel rows with ends staggered, and in firm contact with one another.
  - .5 Cut end boards to suit.
- .4 Hot asphalt application:
  - .1 Install in multiple layers of no more than [ ] mm per layer.
  - .2 Joint: staggered minimum 300 mm.
  - .3 Place boards in parallel rows with ends staggered, and in firm contact with one another.

- .4 Cut end boards to suit.
- .5 Use hot asphalt between layers as recommended by manufacturer.

### **3.9 OVERLAY BOARD APPLICATION**

- .1 Apply overlay board over insulation and pre-secure in accordance with manufacturer's written instructions. Apply with adhesive, fasteners or hot asphalt depending on the type of system being applied.

### **3.10 COMPOSITE OVERLAY BOARD APPLICATION**

- .1 Install materials in accordance with manufacturer's written instructions.
- .2 Apply with adhesive, fasteners or hot asphalt depending on the type of system being applied; to CSA A123.21 for wind uplift resistance and in accordance with reviewed Shop Drawings.

### **3.11 BASE SHEET APPLICATION**

- .1 Install materials in accordance with manufacturer's written instructions.
- .2 Starting at low point of roof, perpendicular to slope, unroll base sheet and heat weld.

### **3.12 CAP SHEET APPLICATION**

- .1 Install materials in accordance with manufacturer's written instructions.
- .2 Starting at low point on roof, perpendicular to slope, unroll cap sheet and heat weld.
- .3 Application to be free of blisters, fishmouths and wrinkles.

### **3.13 FLASHINGS**

- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
- .2 Lap flashing base sheet to membrane base sheet minimum 200 mm and seal by [mopping] [torch welding] [hot air welding].
- .1 Lap flashing cap sheet to membrane cap sheet 150 mm minimum and [torch weld] [hot weld].
- .2 Provide 75 mm minimum side lap and seal.
- .3 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
- .4 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.

### **3.14 WALKWAYS**

- .1 Install walkway in accordance with manufacturer's instructions and as indicated.
- .2 Apply primer to cap sheet membrane and torch apply, ensuring selvage edge is removed.

**3.15 FIELD QUALITY CONTROL**

- .1 Inspections:
  - .1 Inspection and testing of roofing application will be carried out by testing laboratory designated by [Consultant] [Departmental Representative] [DCC Representative] .
  - .2 [DCC Representative] [Consultant] [Departmental Representative] will pay for tests as specified in Section [01 45 00- Quality Control] .
  - .3 Inspection and testing of roofing application will be carried out by testing laboratory designated by [Consultant] [DCC Representative] [Departmental Representative] .
  - .4 Costs of tests will be paid [under cash allowance] [by Owner] .
- .2 Testing:
  - .1 [ ]

**3.16 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 into three streams – reuse, recycle, waste - in accordance with Section 01 74 19- Waste Management and Disposal.
  - .1

**END OF SECTION**