



**Bid Opportunity No. 320-2020**

Provision of Roof Replacement at Winnipeg Fire Paramedic Service (WFPS) No.10  
1354 Border St., Winnipeg, MB



**BID OPPORTUNITY FOR:** Provision of Roof Replacement at Winnipeg Fire Paramedic Service (WFPS) No.10, 1354 Border St., Winnipeg, MB

**DATE:** May 19, 2020

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## 1. ROOFING SCOPE OF WORK - Section 07 52 00

### B1. GENERAL

#### B1.1 REQUIREMENTS

- (a) Furnish all labor, materials, tools and equipment necessary for the removal and disposal of existing low-slope roof (BUR) systems (**Base Bid: Roof-A1 & B1**), including removal of non-operational roof curbing, flashings, etc., and the design and installation of a complete low-slope roof system capped with SBS modified bitumen two-ply system effective min. R30. (Base Sheet Board ISO HD ½" & Composite Cap Sheet 4mm.) Including the accessory items such as new drains, (ensure slope to positive drainage) connections, scuppers, drain inserts, copings, flashings, re-paint gas-lines, rubber blocks c/w roof membrane protection traffic cap, pitch boxes penetration seals c/w liquid sealant, at a minimum.
- (b) Base bid system to be: Soprema Soprasmart ISO HD 180 & Soprema Sopraply Traffic Cap. (Adhesive Fastened System) All installed roofing systems must meet Code and Regulatory Requirements along with recommendations of the most current edition as per the followings.
  - (i) The roof assembly shall be in accordance with CSA A123.21-14 as it pertains to the wind uplift resistance. ULC Standards, ULC approved membranes Class C min. ASTM D 6162-4, system membrane.
  - (ii) All recommendations of the Canadian Roofing Contractors Association (CRCA) "Shall have a design slope minimum of 1.5-2% & 4% back-slope for drainage between drains and denoted perimeter areas as to create effective positive drainage.
  - (iii) Slope flashings to the roof and design roof drains to promote the rapid removal of water from all roof surfaces. Slopes for roofing assembly replacement at existing flat roofs are dependent on practicable heights at perimeters and location of existing roof drains. Including back-sloping parapet coping.
  - (iv) Sheet Metal and Air Conditioning Contractor's National Association, (SMACNA)
  - (v) CMHC Best Practice Flashing Guide
  - (vi) All requirements of the Roofing System Manufacturer's Warranty, (RSMW)
  - (vii) All applicable Province of Manitoba Building Codes
  - (viii) The manufacturer's application instructions for each product used are considered part of this specification and should be followed at all times.
  - (ix) Raising, re-setting, and protection of mechanical, air conditioning equipment, ventilators, and exhaust fans may be required. Removal and re-installing of perimeter lighting and electrical if required. Provision for temporary access and protection onto the roof, such as scaffolding, portable railings, plywood and rigid insulation roof protection, etc.

#### B1.2 SUBMITTALS

- (a) Submit product data sheets for primers, insulation, SBS membranes, adhesives, and MSDS for all products, other safety and handling instructions and installation instructions.
- (b) Submit a letter issued by Roofing Manufacturer stating approved licensed applicator status and approval to issue warranty for specified system on this project.

- (c) Submit roof system(s) adhesive patterns in accordance with CSA123.21-14 including minimum resistance for the field area, edge areas and corner areas. (*Including wind uplift calculation Wind-RCI.*)
- (d) Submit shop drawings showing the slope (saddle, cricket & back-slope) package of all roofs and flow path of rainwater. Confirm structural slope adequacy.
- (e) Submit shop drawings of change of elevation up-stand details & perimeter parapet design with flashings & claddings as required.
- (f) Prior to work submit copy of MB Hydro Commercial Building Envelope Program approval letter and incentive calculation.

### B1.3 REFERENCE STANDARD(S)

- (a) Submit a report[s] within three (3) days of a request of the Contract Administrator, issued by a certified materials testing laboratory, attesting that the roofing system offered, was tested in accordance with CSA A 123.21-10, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane Roofing Systems. Test results shall demonstrate the roofing system provides a Dynamic Uplift Resistance (DUR) of;
  - (i) Roof-A1: -1.2kPa [-25psf] for the field of the roof, -1.6 kPa [-33 psf] for the edge of the roof, and -3.1kPa [-57psf] for the corners of the roof. End zone width 4.78 ft. (1.5m).
  - (ii) Roof-B1: -0.9kPa [-19psf] for the field of the roof, -1.6 kPa [-33 psf] for the edge of the roof, and -3.1kPa [-64psf] for the corners of the roof. End zone width 4.78 ft. (1.5m).
- (b) Membranes must meet or exceed requirements of CGSB 37.56–M (9<sup>th</sup> Draft), Modified bituminous membranes, prefabricated and reinforced for roofing system.
- (c) Membranes must meet or exceed requirements of ASTM D 6162, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements. Membranes must meet or exceed requirements of ASTM D 6163, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
- (d) Membranes must meet or exceed requirements of ASTM D 6164, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- (e) Mineral Wool Roof Insulation boards must meet or exceed requirements of ASTM C 726, Standard Specification for Mineral Wool Roof Insulation Board.
- (f) Polyisocyanurate thermal insulation boards must meet or exceed requirements of CAN/ULC S704-011, Thermal Insulation, Polyurethane and Polyisocyanurate, Boards Faced.
- (g) Extruded Polystyrene Insulation Boards must meet or exceed requirements of CAN/ULC-S701-11, Polystyrene Insulation Board and Pipe Covering.
- (h) Roofing system must meet or exceeds requirements of CAN/ULC-S107-10, Methods of Fire Tests of Roof Coverings, class [C].
- (i) ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- (j) ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings
- (k) ASTM F1667-13 Driven Fasteners; Nails, Spikes & Staples

- (l) Canadian Roofing Contractors Association (CRCA) CRCA Roofing Specifications Manual, (current edition)
- (m) CAN/CSA-A123.4-04 (R2013) Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems
- (n) CSA-A123.23-15 Product Specification for Polymer-Modified Bitumen Sheet, Prefabricated and Reinforced

#### B1.4 DEFINITIONS

- (a) Roofing terminology: Refer to ASTM D 1079 Standard Terminology Relating to Roofing and Waterproofing and CRCA Roofing Reference Manual for definition of terms related to roofing work in this Section.
- (b) "Roofing System" means: all materials contained within the roof assemblies installed by the Contractor, including all materials above the deck including membrane flashing up to and including 1067mm (42") above the surface of the primary membrane, and related sheet metal work.

#### B1.5 COMPATIBILITY

- (a) Same manufacturer shall provide all waterproofing materials.

#### B1.6 TECHNICAL DOCUMENTS

- (a) Submit two (2) copies of the most current technical data sheets within five (5) days of contract award. These documents must describe the materials' physical properties and explanations about product installation, including, restrictions, limitations and other manufacturer recommendations such as long-term maintenance.

### B2. PERIODIC MONITORING

- (a) The City of Winnipeg will engage third party roofing monitoring (QCA). The Monitoring will provide periodic site visits and reports to The City of Winnipeg during the progress of the roofing work, in accordance with the CRCA Roofing Applications Standards, to help ensure the roofing work is provided as set out in this Contract. Upon notice from The City, the Contractor shall expediently perform all steps and make changes as identified by the roofing monitor, at no cost to the City of Winnipeg. The involvement of the roofing monitor does not relieve the Contractor of the responsibility to supervise, inspect and provide the roofing work as set out in this Contract.
- (b) Allow The City of Winnipeg and its agent access to work area and materials for inspection and monitoring purposes.
- (c) If Contractor covers or permits to be covered work that has been designated for special tests, inspections or approvals before such is made, uncover such work, have inspections or test satisfactory completed and make good such work. Costs of any re-work to be borne by the Contractor.
- (d) The City of Winnipeg will order part of work to be examined if work is suspected to be not in accordance with contract documents. If, upon examination such work is found not to be in accordance with contract documents, correct such work and pay cost of examination and correction.
- (e) If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised at no cost to of Winnipeg and shall be corrected within a time-frame determined by The City of Winnipeg. Contractor shall pay costs for retesting and re-inspection. Every effort will be made to expedite the testing process to minimize unnecessary delays, while not compromising the integrity of the procedures; however, the

Roof Monitor will not be pressured into overlooking deficient Work or loosening acceptance criteria to satisfy scheduling or cost issues.

- (f) Engagement of inspection/testing agencies does not relax the Contractor from the responsibility to perform Work in accordance with Contract Documents. Independent Inspection/Testing Agencies will be engaged for purpose of testing portions and inspecting of Work. Cost of such services will be paid by The City of Winnipeg, except for the following: Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- (g) If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:
  - (i) The deficiency shall be documented in the report.
  - (ii) Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Interpretive authority is with QCA.
  - (iii) QCA documents the resolution process.
  - (iv) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, and provides confirmation of completion of correction to QCA. QCA reschedules the test (and any additional population to be tested) with the affected Contractors, and the test(s) repeated until satisfactory performance is achieved.
  - (v) Any required re-testing that is resulted of a deficient installation shall not be considered a justified reason for a claim of delay or for a time extension by the Contractor.
- (h) Provide copies of the manufacturer's site reports to the City of Winnipeg, Consultant, and roofing monitor, prior to Interim Acceptance of the Work.

## B2.2 PROCEDURES

- (a) Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.
- (b) Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

## B2.3 REJECTED WORK

- (a) Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by the Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- (b) Make good other Contractor's work damaged by such removals or replacements promptly.
- (c) If in opinion of the Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, The City of Winnipeg will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by the Contract Administrator.

## B2.4 REPORTS

- (a) Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

## B2.5 TESTS

- (a) Contractor shall perform periodic tests as per applicable standards utilizing third party testing company if required. Results of tests shall be provided to the Contract Administrator.
- (b) Cost of tests shall be the responsibility of the Contractor. Additional test(s) and or site visits may be required due to faulty material and or workmanship. Cost of such tests/visits shall be borne by the Contractor.

#### B2.6 FIELD QUALITY CONTROL

- (a) Coordinate site work and inspections with the Contract Administrator Provide minimum 72 hours' notice.
- (b) Inspection and testing of roofing membranes will be carried out by QCA Building Envelope Consultant including but not limited to membrane-substrate tensile adhesion testing conducted in general accordance with ASTM D 4541, using a Com-Ten Fastener Tester and membrane air-tightness in general accordance with ASTM E 1186.
- (c) Following project completion, The City of Winnipeg and QCA shall conduct a detailed examination in conjunction with the Roofing Contractor.
- (d) Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve contractual responsibility.

### B3. QUALITY ASSURANCE/CONTROL

#### B3.1 MEMBRANE ADHESION TESTING

- (a) The Consultant has the option to conduct pull tests to measure bond strength of roof air/vapour barrier membrane and roof insulation/membrane assembly. Results will be compared to manufacturer's recommendations to determine if corrective action is required and if roofing insulation and membrane(s) can continue. Including but not limited to membrane bond and field uplift resistance of assembly.
- (b) In the absence of manufacturer data, the standard of acceptance will be the average minus one standard deviation for the minimum bond strength.
- (c) Chain drag soundings may be completed on both the air/vapour barrier membrane installation and the cap sheet. A full and intimate bond is required. The Contractor shall rectify any de-bonded areas in accordance with manufacturer's specifications.

B3.2 Airtightness testing would be conducted on the air/vapour barrier; base sheet and cap sheet membrane(s). Testing may also include fasteners and penetrations. Testing would be done using an Air-Leak Detection Unit. Testing would be performed in general accordance with ASTM E 1186 "Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Retarder Systems" (method 4.2.7 *Chamber Depressurization in Conjunction With Leak Detection Liquid*). *Level of acceptance shall be zero-leaks.* The Contractor shall rectify any unsealed areas in accordance with manufacturer's specifications.

### B4. STORAGE AND DELIVERY

- (a) All materials shall be delivered and stored in their original packaging, in conformance with the requirements described in the Manufacturer's Manual. The manufacturer's name, brand, mass, specification number and lot number shall be shown on the labels
- (b) At all times, materials will be adequately protected and stored in a dry and properly ventilated area, away from any welding flame or spark and sheltered from the elements or any harmful substance.
- (c) Store adhesives and emulsion-based waterproofing mastics at a minimum 5 °C (41 °F). Store adhesives and solvent-based mastics at sufficient temperatures to ensure ease of application.



- (d) Materials delivered in rolls will be carefully stored upright; flashing will be stored to avoid creasing, buckling, scratches or any other possible damage.
- (e) Avoid material overloads, which may affect the structural integrity of specific roof areas.
- (f) Fuel must be stored in approved containers and placed in spill containments. Propane tanks must be properly stored and protected from any harms.

## **B5. FIRE PROTECTION**

- (a) Prior to the start of work, conduct a site inspection to make sure that all procedures and proposed changes are approved to minimize the risk of fires
- (b) All nails, bolts, screws and other fasteners, etc. shall all be as recommended by the manufacturer of the materials for which they are to be used.
- (c) Respect safety measures described by the local association recommendations.
- (d) At the end of each workday, use a heat detector gun and/or Infrared Thermographic camera to spot any smoldering or concealed fire. Provide firewatcher for a minimum of two hours after final torch application.
- (e) Never apply the torch directly to old and wood (combustible) surfaces.

B5.2 Throughout roofing installation, maintain a clean site and have one approved ABC fire extinguisher within 6 m (20 ft.) of each roofing torch. Respect all safety measures described in technical data sheets. Torches must never be placed near combustible or flammable products. Torches should never be used where the flame is not visible or cannot be easily controlled.

## **B6. MATERIALS**

### **B6.1 DIMENSIONAL LUMBER**

- (a) (a) This shall be pine or spruce to CAN/CSA-O141, construction grade, maximum 15% moisture content at time of installation of the dimensions as outlined under the Description of Work.

### **B6.2 PLYWOOD SHEATHING**

- (a) This shall be 1/2" construction D Grade spruce plywood.

### **B6.3 VAPOUR BARRIER SUPPORT PANEL (*For steel decking areas.*)**

- (a) Fiberglass Mat Faced Gypsum Roof Board:
  - (i) Thickness: 5/8 inch.
  - (ii) Width: 4 feet.
  - (iii) Length: 8 feet.
  - (iv) Surfacing: Fiberglass mat with non-asphaltic coating.
  - (v) In conformance with: ASTM E84 and ASTM C1177
- (b) Specified Product: GP DensDeck Prime Roof Board or approved equal in accordance with B7.

### **B6.4 VAPOUR BARRIER MEMBRANE**

- (a) Description: Self-adhesive membrane composed of SBS modified bitumen, with a surface screen made of high-density polyethylene laminated between two layers of polyethylene films. The width of the membrane is 1.14 m (45 in) to allow the membrane to fit on the top of most structural steel deck profiles. The self-adhesive underface is protected with a silicone plastic release film. And compatible with substrates and adjoining membranes.
- (b) Specified Product: Soprapap'r by Soprema or approved equal in accordance with B7.

**B6.5 ROOFING INSULATION**

- (a) Polyisocyanurate insulation
  - (i) Description: Closed-cell polyisocyanurate foam insulation board laminated on both sides to a glass fiber reinforced felt facer. (Minimum system R-30 effective value.)
  - (ii) Specified product: SOPRA-ISO (base layer) & SOPRA-ISO PLUS (Top-layer if required for membrane.) by SOPREMA or approved equal in accordance with B7.
- (b) Tapered Insulation Panel
  - (i) Description: Tapered insulation panel made of polystyrene designed as required to create a minimum 1.5% field slope to positive drainage and a three-to-four percent (3%-4% {Double Field Slope}) back-slope to the roof system at drains and specified perimeters. Molded Expanded Polystyrene (MEPS) Board: certified for conformance with CAN/ULC S701, Thermal Insulation, Polystyrene, Boards and Pipe Covering, Type 2, and as follows;
    - ◆ Thermal Conductivity (kSI): 0.036 W/m°C maximum.
    - ◆ Dimensional Stability: 0.3% max. Linear change.
    - ◆ Certification: third party, in accordance with CGSB, ULC, or other certification programs accredited by the Standards Council of Canada.
    - ◆ Specified product: Plastifab or approved equal in accordance with B7.
- (c) Sump insulation panel for drain location (See above)
  - (i) Description: Sump insulation panel made of EPS Type II designed to facilitate proper drainage around drain.
  - (ii) Product specified: Tapered Plastifab EPS or approved equal in accordance with B7.

**B6.6 INSULATION ADHESIVE**

- (a) Description: A highly elastomeric, two components, one step, all purpose, foamable adhesive that contains no solvents and sets in minutes. Adhesive shall be applied to obtain a minimum 90 mile-per-hour wind up with rating or as otherwise indicated within the description of work.
- (b) Specified product: Soprema Duotack (Cold-weather Duotack 365) or approved equal in accordance with B7.

**B6.7 POURABLE SEALER**

- (a) This shall be Lexcan 2 part Pourable Sealer or approved equal in accordance with B7. This shall be used to fill all pitch boxes or approved equal in accordance with B7.

**B6.8 OVERLAY BOARD**

- (a) N/A

**B6.9 MODIFIED BITUMEN MEMBRANE**

- (a) This shall be the following:
  - (i) Membrane: Two-ply Modified Styrene-Butadiene-Styrene (SBS)

**B6.9.1 Base Sheet Field: Base Sheet Panel**

- (a) Description: High performance base sheet panel composed of SBS modified bitumen membrane with a non-woven polyester reinforcement, factory-laminated on a HD polyisocyanurate insulation support panel (SOPRA-ISO PLUS HD). The surface is covered with a thermofusible film.
- (b) Thickness: 14.9 mm (1/2") R2.5

- (c) In conformance with: CGSB 37.56-M (9<sup>th</sup> Draft).
- (d) Specified product: Soprasmart ISO HD 180 by SOPREMA or approved equal in accordance with B7.

#### B6.9.2 Base Sheet Membrane for Flashings and Parapets

- (a) In conformance with: CGSB 37.56-M (9<sup>th</sup> Draft).
- (b) Specified product: Sopralene Flam Stick by SOPREMA or approved equal in accordance with B7.

#### B6.10 Cap Sheet: The cap sheet under face is covered with a thermo-fusible plastic film and the top surface is protected by grey; coloured granules.

- (a) Colour Choices for Roofing Cap Sheet Membrane Granules
  - (i) For field surfaces: **Grey**.
  - (ii) For walkway surfaces: **Contrasting colour**.
  - (iii) In conformance with: ASTM D6162.
  - (iv) Specified Product: SOPRAPLY TRAFFIC CAP 560 by Soprema or approved equal in accordance with B7.

### B6.11 ACCESSORY MEMBRANES

- (a) Cover Strip VB and BASE
  - (i) Description: Membrane strip 240 mm (9.45 in) made of SBS modified bitumen and composite reinforcement. Both faces are covered with a plastic thermofusible film. The strip ensures water-tightness in the end laps.
  - (ii) In conformance with: ASTM D6162.
  - (iii) Specified product: SOPRALAP by SOPREMA or approved equal in accordance with B7.

### B6.12 COMPLEMENTARY WATERPROOFING PRODUCTS

- (a) Waterproofing mastic
  - (i) Description: Multi-purpose solvent-based mastic, containing SBS modified bitumen fibers with aluminum pigments and mineral fillers
  - (ii) Specified product: SOPRAMASTIC ALU by SOPREMA or approved equal in accordance with B7.
- (b) Pitch pocket filler
  - (i) Description: Polyurethane pre-fabricated pitch pocket system, in various sizes, with compounds that bond together, with solvent less mastic and with one component elastomeric sealant.
  - (ii) Specified product: Sopramastic Block SYSTEM by SOPREMA or approved equal in accordance with B7.
- (c) Sealing product
  - (i) Description: Bitumen/polyurethane waterproofing mono-component resin and polyester reinforcements. Employed at membrane leading edges, penetrations & granule repair.
  - (ii) Specified products: ALSAN FLASHING and FLASHING REINFORCEMENT by SOPREMA or approved equal in accordance with B7.
- (d) Miscellaneous Sealant
  - (i) Polyether-based, single-component, water-reactive elastomeric sealing mastic and adhesive. Membrane leading edges and miscellaneous sealing details.

- (ii) Specified products: Sopramastic SP2 by SOPREMA or approved equal in accordance with B7.

### **B6.13 PERIMETER SECUREMENT**

- (a) Perimeter Fastening Restraint SOP36/35

### **B6.14 RUBBERIZED MASTIC**

- (a) This shall be Polyroof as manufactured by Tremco Ltd. or approved equal in accordance with B7. All exposed rubberized asphalt shall be coated with Gray Soprema.

### **B6.15 ROOF PROTECTION MAT**

- (a) Description: rubber mat manufactured from recycled materials. It is intended to protect membranes from foot traffic, falling ice and other objects.
- (b) Product: Soprema Sopramat or approved equal in accordance with B7.

### **B6.16 ROOF DRAINS**

- (a) Description: One-piece spun aluminum body, heavy-duty cast aluminum strainer dome, and clamping ring. (Control flow as required)
- (b) Specified product: OMG Hercules RetroDrain HDAL or approved equal in accordance with B7.

### **B6.17 PIPE & SEALER**

- (a) Pipe and sealer as required by Code and as recommended by manufacturer where required for new drain pipes, to extend existing drain pipes, vent pipes, mechanical unit pipes or gas lines as necessary to suit site conditions. Provide fire-rated pipe and all associated accessories as required by Code for building area and application.

### **B6.18 PIPE INSULATION**

- (a) Pipe insulation for mechanical unit pipes and drain pipes to be compatible with existing application and new materials specified in other sections. Drain pipe insulation to be 25mm (1") Fiberglas or equal 88 Kg/m (cubed) (52 16/cu. ft.) density pipe insulation with ASJ jacket, complete with vapour barrier. Insulate full length of all drain pipes.

### **B6.19 PIPE JACKETING**

- (a) Drain pipe PVC jacketing system to be Smoke-Less 25/50 of ULC listed 25/50 Genotherm D007 PVC by the Sure-Fit System, 26 Greensboro Drive, Rexdale, Ontario, M9W 1E1 (416-241-0810) or approved equal in accordance with B7.

### **B6.20 GAS LINE, RACEWAY & SMALL EQUIPMENT SUPPORTS:**

- (a) UV resistant, rubber blocks with metal C-Port Series by Clearline Technologies, B-line Supports Dura-block Rooftop Supports by Eaton, or approved equal in accordance with B7.

### **B6.21 SPLASH PADS**

- (a) Description: Precast concrete splash block
- (b) Specified product: Barkman Concrete 105604 30 "Natural or approved equal in accordance with B7.

### **B6.22 DUCT INSULATION**

- (a) 50mm Fiberglass RFFRK reinforced foil-faced vapour seal duct insulation PF335, 340 g. (3/4lb./ft.3) density.
- (b) Overwrap: 880 kg/m<sup>3</sup> (55 lb. /cu. ft.) density roofing felt with welded pin fasteners.
- (c) Seam and joint sealants: Duro-Dyne F2 fibreglas duct tape, Duro-Dyne S-2 duct sealer, asphalt.
- (d) Acceptable coverings: VentureClad 1577CW, white TPO covering with welded seams, or approved equal in accordance with B7.

#### **B6.23 MODIFIED PRIMER**

- (a) This is to be the compatible primer recommended by the membrane manufacturer employed. (When applicable environmentally friendly low VOC products shall be applied.)

#### **B6.24 CAULKING**

- (a) This shall be Tremco Vulkem 931 or approved equal in accordance with B7.

#### **B6.25 ALUMINUM PAINT**

- (a) Waterproofing coating applied with a brush or a roller composed of elastomeric bitumen, mineral fillers and solvents.
- (b) Specified products: Sopralastic 124 Alu by SOPREMA or approved equal in accordance with B7.

#### **B6.26 VENT STACKS**

- (a) These shall be Insulated Stack Jack Flashings (with metal cap, not neoprene seal) SJ-26A as manufactured by Thaler or approved equal in accordance with B7.

#### **B6.27 STEEL CLADDING**

- (a) Specified product: Vicwest AD300
- (b) Fabricated from Z275 galvanized sheet steel conforming to ASTM A653M Grade 230 or AZ150 Galvalume, sheet steel conforming to ASTM A792M Grade 230.
- (c) Fasteners: Galvanized, with exposed fasteners colour matched to cladding.
- (d) Prefinished cladding colour to be selected from the manufacturer's standard colour range by The City of Winnipeg.

#### **B6.28 WATER-RESISTIVE BARRIER (WRB)**

- (a) Specified product: DuPont Tyvek Commercial Wrap or approved equal in accordance with B7.
- (b) DuPont Self-Adhered Flashing products as per DuPont Installation Guidelines

#### **B6.29 METAL FLASHING**

- (a) The bays and cap flashing shall be a minimum of 24 gauge in thickness. Finishes shall closely match the painted colour of the existing flashing. This shall be chosen from the range of Stelco 8000 series of colours.

#### **B6.30 ACCESSORIES**

- (a) All nails, bolts, screws and other fasteners, etc. shall all be as recommended by the manufacturer of the materials for which they are to be used.
- (b) Provide all accessories required in accordance with manufacturer's recommendations.

(c) Ensure compatibility between all components.

**B6.31 TRANSITION SEALANT SBS-to-BUR**

(a) This shall be Soprema Colply Adhesive Trowel Grade or approved equal in accordance with B7. (NA)

**B6.32 MECHANICAL SUPPORT**

(a) UV resistant, 100% recycled rubber blocking with protective adhered SBS cap scrim sheet under blocking. TG or SA

(b) Specified Product: C-Port by Clearline Technologies Inc. or approved equal in accordance with B7.

**B7. EXECUTION**

**B7.1** Before roofing work begins, the Consultant and Roofing Foreman will examine and approve deck conditions. If necessary, a non-conformity notice will be issued to the contractor so that required corrections can be made. The start of roofing work will mean roofing conditions are acceptable for work completion.

**B7.2** Examine substrate for compliance of conditions that affect installation and performance of roof system.

**B7.3** The Contractor shall be responsible for the removal and reinstallation of any obstructions such as, but not limited to, drains, ducts, conduits, vents, air conditioning units and components at his own expense.

**B7.4** Work must be performed during weather conditions that will not adversely affect the performance of the new Work. Surfaces must be clean and dry prior to installation.

**B7.5** Cover walls and adjacent Work where materials hoisted or used.

**B7.6** Clean off drips and smears of bituminous material.

**B7.7** Dispose of rainwater off roof and away from face of building until roof drains or hoppers are installed and connected.

**B7.8** Prevent traffic over completed roofing except where required by Work above roof level. Comply with precautions deemed necessary by Bid Opportunity. Repair damage caused by non-compliance with Bid Opportunity requirements.

**B7.9** At the end of each day's Work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.

**B7.10** Examine roof decks and immediately inform Contract Administrator in writing of defects.

**B7.11** Prior to commencement of Work ensure:

(a) Decks are firm, straight, smooth, dry, and swept clean of dust and debris.

(b) Curbs have been built.

(c) Roof drains have been installed at proper elevations relative to finished roof surface.

(d) Plywood and lumber nailer plates have been installed to walls and parapets as indicated.

**B7.12** Removal of Existing Roofing

- (a) Remove existing roofing system, curbs and cant strips as required to properly install new roofing system. Avoid damage to decks, drains, and other components on roofs.
- (b) Provide temporary hoarding, other protection as may be required.
- (c) Fully protect interior of building from water penetration and or construction debris from any cause.

B7.13 Prepare remaining surfaces to accept new roofing system. To selected roofing manufacturer's specifications, recommendations and proven standards.

## **B8. APPLICATION**

- B8.1 Ensure a roofing foreman is on Site and supervising the roofing work at all times when roofing work is undertaken. Ensure that at least one other Qualified Roofing Trades-person shall be on Site when roofing work is undertaken
- B8.2 Ensure that all Qualified Roofing Trades-persons necessary to receive the manufacturer warranties, as set out within, are appropriately trained by the manufacturer and are on Site, at all relevant times.

## **B9. PREPARATION**

- B9.1 If required, rooftop equipment, electrical and gas service lines, telephone lines, etc. must be disconnected, relocated and reconnected as required in accordance with all applicable codes and regulations to accommodate the Work without disrupting operations within the facility. Prior arrangement must be made with the Contract Administrator in the event a disruption of building operations is required.
- B9.2 Remove and dispose of all metal flashings as required.
- B9.3 Remove existing roofing system to the roof deck in the area shown on the attached drawing.
- B9.4 Remove and dispose of any equipment as designated by The City of Winnipeg and seal any resulting openings with pre-painted 20 gauge, 1 ½" steel decking or like-kind wood decking to match.
- B9.5 Inspect and repair any deck deficiencies that would affect the installation and performance of the new roof system.
- B9.6 Fill and pack all open joints, cracks, seams, and openings in the deck.
- B9.7 Construct edge, expansion joint, projection, and all equipment curb blocking and nailers to accommodate insulation thickness. Extend all curbs to a minimum height of 203 mm (8") above the finished roof surface.
- B9.8 All blocking to be construction grade spruce wood.

## **B10. VAPOUR BARRIER SUPPORT PANEL INSTALLATION ON DECK**

- B10.1 Adhered or Mechanically Attached: As recommended by roof system and/or adhesive manufacturer or as required by FM or UL guidelines for wind uplift resistance.
- B10.2 Joints staggered and fit tight.

**B11. VAPOUR BARRIER INSTALLATION**

- B11.1 Primer must be dry prior to the installation of the vapour barrier membrane Cut boards so edges rest on center of upper ribs/load bearing surfaces. Cut straight lines with adequate tools.
- B11.2 Beginning at the bottom of the slope, without adhering the membrane, unroll onto the substrate for alignment. Do not immediately remove the silicone release sheet.
- B11.3 Align the roll parallel to the corrugations of the steel deck. Make sure the membrane overlaps are supported along their entire length.
- B11.4 Peel back one end of the silicone release sheet and adhere this part of the membrane to the substrate. Peel back the remaining release sheet at a 45° angle to avoid wrinkles in the membrane.
- B11.5 Overlap adjacent membranes by 75 mm (3 in). Overlap end laps by 150 mm (6 in). Stagger end laps by at least 300 mm (12 in).
- B11.6 When the vapour barrier is installed directly on the steel deck, place a thin sheet of metal under the end lap of the vapour barrier.
- B11.7 At all junctions with existing roof assemblies, install water/vapour retarder cut-offs consisting of self-adhesive vapour retarder. Seal to new vapour retarder and carry it vertically between existing and new insulations, sealing it to the prepared surface of the existing roof membrane. Apply compatible sealants as required at laps and joints to ensure water ingress protection of the new assembly.

**B12. INSULATION**

- B12.1 ADHESIVE FASTENED SYSTEM: Adhere insulation by using specified adhesive in continuous strips (minimum ¾" wide) spaced as per wind-uplift calculations on the field surface, on the perimeter, and on corners. [CSA A123.21-14.] Corners and perimeters must be installed as per FM requirements listed in the PLPDS 1-29].
- B12.2 Replace any area of damaged or deteriorated existing insulation. Fill all voids and cracks with specified insulation material.
- B12.3 The insulation must be installed to ensure that water cannot pool in the newly replaced area.
- B12.4 Tightly butt all insulation panels in half lap fashion. Offset the pattern between layers so that no insulation joints are coincidental.
- B12.5 Adhered the layers of insulation using the specified adhesives. The application of the adhesive must be done in strict accordance to manufactures guidelines so as to obtain a minimum uplift equal to 90 mile-per-hour. Stagger the layers of insulation from one another to prevent jointing. All adhesive secured assembly components must be properly stepped-in and rolled with a weighted roller to ensure contact of mateable surfaces.
- B12.6 Leave no openings or gaps at projections or perimeters.
- B12.7 Complete vapour retarder envelope wrap by sealing ends of vapour retarder to the top on the insulation.
- B12.8 At drains and scuppers, taper insulation for 24" in all directions to ensure positive drainage.
- B12.9 Install protection layer of ½" Sopraboard as required including fire protection tape c/w primer as required.



**B13. SUMP INSULATION PANEL INSTALLATION**

- (a) Install sump insulation panel in conformance with manufacturer's instructions and recommendations.

**B14. INSTALLATION OF FLAME STOP MEMBRANES**

- (a) Adhere the membrane directly onto an approved substrate by peeling back the silicone release film. SOPRAGUARD TAPE is designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.
- (b) Unroll the flame-stop membrane onto the insulation without adhering, being careful to overlap adjacent strips to ensure that the flame will not come in contact with the insulation.

**B15. INSTALLATION OF BASE SHEET PANEL ON FIELD SURFACE**

- (a) All panels must be perfectly aligned without any significant height difference between them.
- (b) Prior to installation, unfold panel onto the roof surface and allow to relax.
- (c) Adhere the base sheet boards with beads of adhesive applied according to the spacing specified in the wind uplift test reports, ensuring that the pattern chosen meets the required wind uplift resistance for the building.
- (d) Seal end laps with a 240-mm (9.45-in) wide protection strip centered on the joint .
- (e) Seal all side laps using a torch and a round-nosed trowel.
- (f) Avoid the formation of wrinkles, swellings or fish-mouths.
- (g) Weights and or weighted rollers shall be employed to ensure proper adhesive to assembly component contact/adhesion.
- (h) Perimeter restraint as per manufacturers recommendations. (*Perimeter Fastening-SOP35 or 36*)

**B16. BASE SHEET FLASHING INSTALLATION (SELF-ADHERED)**

- (a) Provide minimum ½" plywood sheathing to all mateable surfaces as required to ensure suitable substrate to receive membrane(s).
- (b) Apply base sheet flashing only after primer coat is dry.
- (c) Before applying membranes, always remove the plastic film on the section to be covered if there is an overlap (inside and outside corners and field surface). For sanded base sheet membranes, apply primer for self-adhered membrane to the area to be covered at the foot of the parapets.
- (d) Cut off corners at end laps to be covered by the next roll.
- (e) Overlap side laps by along lines provided for this purpose, and overlap end laps by 150 mm (6 in) Stagger end joints by a minimum of 300 mm (12 in).
- (f) Position the pre-cut membrane piece. Peel back 150 mm (6 in) of the silicone release paper to hold the membrane in place at the top of the parapet.
- (g) Then, gradually peel back the remaining silicone release film, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the up-stand and the field surface. Smooth the entire membrane surface with a roller for full adhesion.
- (h) Install a reinforcing gusset in all inside and outside corners.
- (i) Always seal overlaps at the end of the workday.
- (j) Avoid the formation of wrinkles, voids or fish-mouths.

**B16.1 INSTALLATION OF REINFORCED GUSSETS**

- (a) Install a reinforcing gusset in all inside and outside corners.
- (b) Heat-weld the gussets in place after installing base sheet membrane.

**B16.2 INSTALLATION OF HEAT-WELDED REINFORCEMENTS**

- (a) Install reinforcements specified for various roof surfaces according to the following instructions and illustrations of membrane manufacturer.

**B17. ROOFING CAP SHEET INSTALLATION (TORCH-APPLIED MEMBRANE)**

- (a) Begin with double-selvage starter roll. If starter roll is not used, side laps covered in granules must be degranulated by embedding side laps in torch-heated bitumen over a 75 mm (3 in) width.
- (b) [Starting at drain] Unroll the cap sheet membrane on the base sheet without adhering, taking care to align the first strip parallel to the edge of the roof.
- (c) Cut off corners at end laps to be covered by the next roll.
- (d) Overlap side laps by along lines provided for this purpose, and overlap end laps by 150 mm (6 in) Stagger end joints by a minimum of 300 mm (12 in).
- (e) During installation, be careful not to overheat the membrane.
- (f) Avoid the formation of wrinkles, voids or fishmouths.
- (g) Conserve membrane's appearance. Avoid walking over finished surfaces; use protective walkways as needed.
- (h) Use straight edge to cut materials.

**B17.2 INSTALLATION OF HEAT-WELDED CAP SHEETS ON UPSTANDS AND PARAPETS**

- (a) This cap sheet must be installed in one-meter-wide strips.
- (b) Overlap side laps by 76mm (3 in) along lines provided for this purpose, and overlap end laps by 150 mm (6 in). The side joints must overlap and must be staggered by at least 100 mm (4 in) with respect to the joints of the cap sheet on the field surface, to avoid areas of excessive membrane thickness.
- (c) Cut off corners at end laps to be covered by the next roll.
- (d) Use a chalk line to draw a straight line on the field surface 150 mm (6 in) from the upstands and parapets.
- (e) Use a propane torch and round-nose trowel to embed the surface granules in the layer of hot bitumen starting from the chalk line on the field surface to the bottom edge of the upstand or parapet as well as on the granulated vertical surfaces that are to be overlapped.
- (f) This cap sheet will be heat-welded directly to the base sheet membrane, proceeding from bottom to top.
- (g) Avoid the formation of wrinkles, voids or fish-mouths.
- (h) During installation, be careful not to overheat the membrane.

**B18. MEMBRANE WALKWAY INSTALLATION**

- (a) Install membrane walkways at roof access points respecting requirements previously stipulated for cap sheet installation. Apply primer to cap sheet before installing walkways.

**B19. WATERPROOFING FOR VARIOUS DETAILS**

- (a) Install waterproofing membranes in conformance with various roofing details illustrated in the manufacturer's manual instructions and recommendations.

**B20. TIE-INS**

B20.1 NA

**B21. PLUMBING VENTS**

B21.1 Install Thaler SJ-27 roof flashings embedded into a generous bed of adhesive ensuring that coverage extends beyond the edge of stack extension flashing.

B21.2 Place stack extension over vent and over-trowel with adhesive extending a minimum of 4" beyond the edge of the flange.

B21.3 Strip in entire flange edge with 6" reinforcing membrane embedded in and top-dressed with adhesive.

B21.4 SBS membrane edges shall be terminated with secondary seal of Alsan LAM or SP2.

B21.5 Fit and seal PVC pipe section to the plumbing vent hub and insulate in accordance with the manufacturer's instructions.

**B22. FLASHING ROOF DRAINS**

B22.1 Carry roofing membranes down into sump to edge of drain fitting.

B22.2 Embed flashing flange into 3 mm thickness of sealing compound on top of roofing membrane.

**B23. METAL FLASHINGS**

B23.1 Cap flashings are to be 24 ga. galvanized sheet metal. The flashings are to conform to C.S.A.

B23.2 The inside and outside faces are to extend down a minimum of 76 mm (3"). Fasten the cap flashing using weatherproof screws spaced not more than 610 mm (24") on centre.

B23.3 Hem all free edges and seal all butts, joints and reglets with sealant.

**B24. ROOF DECKING**

B24.1 The Contractor shall assess the condition of the deck while doing the roof repairs. Based on the assessment, the Contractor will estimate the requirement and square footage of the deck replacement if any is required.

B24.2 The Contractor will inform the Contract Administrator and submit the requirement with the plan and drawings designed by a registered Structural Engineer.

B24.3 The Contract Administrator will inspect and approve, reject, reduce or increase the area of the steel deck to be replaced.

B24.4 This work will not start until the Contract Administrator approves it.

B24.5 Design Requirements

- (a) The roof decking replacement plan must be designed and the drawings stamped by a Structural Engineer registered with the APEGM.

- (b) Deflection under specified live load not to exceed 1/300 of span for roof, 1/360 of span for floor and 1/180 of span for wall.
- (c) Design replacement sections to same as existing deck sections.

**B24.6 Fastening**

- (a) Ensure nail head standoffs measurements meet fastener manufacturer's recommendations.

**B24.7 Products**

- (a) Materials  
Materials to match existing deck
- (b) Deck Types  
Deck to match existing deck.

**B25. MISCELLANEOUS SPECIALTIES**

- (i) N/A

**B26. FIELD QUALITY CONTROL**

- (a) Field inspection will be performed under provisions of Section 01 45 16.
- (b) Quality Control of the work will be provided by QCA Building Envelope Limited (QCA). If conditions are unacceptable, QCA will notify the Contractor, Project Administrator and City.
- (c) Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- (d) If defects and or non-conforming items are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of concern. Correct defect and irregularities as advised by Consultant at no cost to The City of Winnipeg. Contractor to pay costs for retesting and re-inspection.

**END OF SECTION**

**APPENDIX: MAJOR COMPONENTS**

1. The major components of the Work are as follows:

**1. Roof Replacement in Section 1: ROOF-A1 & B1**

<b>EXISTING ROOF ASSEMBLY: ROOF-A1</b>
4-PLY BUR C/W TOP-COAT & PEAGRAVEL
2.5" FIBREBOARD
15# FELT VAPOUR RETARDER IN ASPHALT
STEEL DECKING

<b>NEW ROOF ASSEMBLY: ROOF-A1 (See Design Notes.)</b>
SOPRAPLY TRAFFIC CAP 560
BASE SHEET PANEL BOARD ISO HD 180
POLY-ISO (Minimum system R-30 effective value.
TAPERED EPS TYPE II (Min. 1.5% to achieve pos. drainage)
TAPERED BACK-SLOPE EPS TYPE II (Min. 4% to achieve pos. drainage)
SOPREMA SOPRAVAP'R
5/8" THERMAL BREAK SHEATHING
{STEEL DECKING}*

\*{REPLACE EXISTING DAMAGED COMPONENTS AS REQUIRED}

<b>EXISTING ROOF ASSEMBLY: ROOF-B1</b>
4-PLY BUR C/W TOP-COAT & PEAGRAVEL
2" FIBREBOARD
15# FELT VAPOUR RETARDER IN ASPHALT
STEEL DECKING

<b>NEW ROOF ASSEMBLY: ROOF-B1</b>
SOPRAPLY TRAFFIC CAP 560
BASE SHEET PANEL BOARD ISO HD 180

POLY-ISO (Minimum system R-30 effective value.
TAPERED BACK-SLOPE EPS TYPE II (Min. 4% to achieve pos. drainage)
SOPREMA SOPRAVAP'R
5/8" THERMAL BREAK SHEATHING
{STEEL DECKING}*

THE END