PART 1 - GENERAL

1.1 Related Requirements

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.2 References

.1 ASTM International (ASTM).
- .1 ASTM A123/A123M-13, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM C209-12, Standard Test Methods for Cellulosic Fiber Insulating Board.
- .3 ASTM C1177/C1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .4 ASTM D41/D41M-11, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

.2 Canadian Standards Association (CSA)
- .1 CSA A23.1-14, Concrete Materials and Methods of Concrete Construction.
- .2 CSA A123.3-05(R2010), Asphalt Saturated Organic Roofing Felt.
- .3 CAN/CSA-A123.4-04 (R2013), Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 19.24-M90, Multicomponent, Chemical Curing, Sealing Compound.
- .2 CGSB 37-GP-9Ma, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .3 CGSB 37-GP-56M-80 (Amend), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.4 Canadian Roofing Contractors Association (CRCA).
- .1 CRCA Roofing Specifications Manual.

.5 Factory Mutual (FM Global).

.6 Underwriter's Laboratories of Canada (ULC)
.1 CAN/ULC S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced.

1.3 Administrative Requirements

.1 Convene pre-installation meeting no later than one week prior to beginning waterproofing Work, with roofing contractor's representative and Departmental Representative.
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades if required.
.4 Review manufacturer's installation instructions and requirements.

1.4 Action and Informational Submittals

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:
.1 Provide copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
.1 Submit product data for roof membranes, asphalt, sealants and roof accessories.
.2 Provide copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements, and indicate VOC content for:
.1 Primers.
.2 Asphalt.
.3 Sealers.
.4 Adhesives.

.3 Shop Drawings:
.1 Indicate flashing, control joints, mechanical fasteners and pattern and all related details.
.2 Provide layout for tapered insulation.

.3 Provide layout of engineered guard rail indicating profiles, sizes, connections, size and type of fasteners and accessories.

.4 Submit laboratory test reports certifying compliance of bitumens and fibreboard and membrane and insulation with specification requirements.

.5 Submit copy of work order indicating materials have been ordered and delivery dates.

1.5 Quality Assurance

.1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems approved by manufacturer.

1.6 Fire Protection

.1 Fire Extinguishers: maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection. Size 9 kg on roof per torch applicator, within 10 m of torch applicator.

.2 Maintain a minimum fire watch for 1 hour after each days roofing operations cease and as according to Hot Works requirement of the Canadian Fire Code (latest edition).

.1 During work and at completion of days' work monitor for hot spots on roofs with heat detecting devices.

1.7 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 rolls of felt and membrane in upright position. Store membrane rolls with selvage edge up.

.4 Remove only in quantities required for same day use.

.5 Place plywood runways over completed work and existing roofs not under construction to enable movement of material and other traffic.

.6 Store sealants at +5°C minimum.

.7 Store insulation protected from daylight and weather and deleterious materials.

.8 Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.

1.8 Environmental Requirements

.1 Ambient conditions:

.1 Do not install roofing when temperature remains below -18°C for torch application, or -5°C and to manufacturers' recommendations for mop application.

.2 Minimum temperature for solvent-based adhesive is -5°C.

.2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

.3 Disposal of demolished materials are to be removed from site and disposed of in an approved disposal site as authorized by authority having jurisdiction. Contractors may be requested to provide certified weigh bills or receipts from authorized disposal sites.

1.9 Warranty

.1 Provide a written CRCA warranty stating that the installed roofing membrane is warranted against defects and leakage for a period of three (3) years from date of Substantial Completion of project.

.2 Contractor shall deliver to the Departmental Representative, prior to Contract signing, a signed and sealed letter stating that he will provide the warranty coverage for his work in accordance with above.

.3 The warranty shall state that the entire cost, including labour and materials, of replacing or repairing the roofing membrane shall be borne by the warrantor.

.4 Provide a warranty and CRCA preventative maintenance manual before final acceptance of roofing.

PART 2 - PRODUCTS

2.1 Performance Criteria

.1 Compatibility between components of roofing system is essential. Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

2.2 Deck Primer

.1 Asphalt primer: to CGSB 37-GP-9Ma and ASTM D41.

2.3 Deck Covering

.1 Glass Mat, Gypsum Board: to ASTM C1177/C1177M, FM Class 1, UL 790; mold and moisture resistant; designed specifically as roof board.

.2 Fasteners for securing deck covering to metal deck: corrosion-resistant coated #2 Phillips, recessed head screws, complete with 75 mm diameter x 0.80 mm thick galvanized steel plates; Factory Mutual listed.

2.4 Membrane

.1 Base sheet: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, fiberglass reinforcement, weighing 180 g/m^2, minimum thickness of 2.0 mm ± 0.2 mm.
- .1 Type 1, fully adhered.
- .2 Grade heavy duty service.
- .3 Top and bottom surfaces:
  - .1 Polyethylene/sanded.
- .4 Acceptable products:
  - .1 Modified PLUS NP180P/S by Henry Company.
  - .2 Modiflex MP-180-FS by IKO.
  - .3 Elastophene 180 P.S by Soprema.

.2 Fire Seal Membrane: SBS modified bitumen membrane, reinforced, thermofusible plastic film top surface, self-adhering bottom surface with release paper. Provide primer as recommended by manufacturer.
- .1 Acceptable products:
  - .1 NP180 Tack Sheet by Henry Company.
  - .2 Armourbond Flash by IKO.
  - .3 Sopralene Flam Stick by Soprema.

.3 Base Flashing and reinforcing sheet: to CGSB 37-GP-56M Styrene-Butadiene-Styrene (SBS) Elastomeric Polymer, prefabricated sheet, polyester reinforcement, weight 180 g/m^2, minimum thickness of 3.0 mm ± 0.2 mm.
- .1 Type 1, fully adhered.
- .2 Class C - Plain surface.
- .3 Grade: heavy duty service.
- .4 Top and bottom surfaces.
  - .1 Polyethylene/polyethylene.
- .5 Acceptable products:
  - .1 Modified PLUS NP180P/P by Henry Company.
  - .2 TP-180-FF by IKO.
  - .3 Sopralene Flam 180 by Soprema.

.4 Cap sheet: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester reinforcement, weighing 250 g/m^2, minimum thickness of 4 mm ± 0.2 mm at selvage edge.
- .1 Type 1, fully adhered.
- .2 Class A-granule surfaced.
- .3 Grade heavy duty service.
- .4 Bottom surface: polyethylene.
- .5 Acceptable products:
  - .1 Modified PLUS NP 250g T5 by Henry Company.
  - .2 Torchflex TP-250 by IKO.
  - .3 Sopralene Mammouth 250 by Soprema.

.5 Cap flashing: same as Cap sheet, 1000 mm wide, unless noted otherwise.

.6 Expansion joint membrane: same as base sheet.

2.5 Bitumen and Asphalt Felts

.1 Asphalt: to CSA A123.4, Type II or III. Provide EVT, FBT and Flash Point Temperature.

.2 Asphalt felt: No. 15 asphalt saturated organic roofing felts to CSA A123.3.

2.6 Isocyanurate (Urethane) Insulation

.1 Insulation: to CAN/ULC-S704, Facing to be factory applied kraft paper, CFC free.
- .1 RSI: 1.05 / 25 mm thickness.
- .2 Edges: square.
- .3 Type: 4.
- .4 Shape: flat and tapered, thickness as indicated on drawings. Boards are to be a maximum of 1220 mm width x 1220 mm length.
- .5 Taper: as indicated on drawings.
- .6 Acceptable products:
  - .1 Iso-Mar by ISOX.
  - .2 IKOtherm by IKO.
  - .3 ACFoam II by Atlas.
  - .4 E'NRG"Y 3 by Johns Manville.
  - .5 Colgrip "B" by Soprema.

2.7 Recovery Board

.1 Recovery board: prefabricated board consisting of mineral filled, high melt point asphalt core between non-woven glass fibre mats, 6 mm thick.

2.8 Crickets

.1 Provide tapered shapes as indicated. Form using tapered polyisocyanurate insulation.

.2 Insulation to be by same manufacturer supplying insulation for use at field of roof.

2.9 Sealers

.1 Modified bitumen mastic: as recommended by roofing membrane manufacturer.

.2 Sealing compound: rubber asphalt type.

.3 Sealants: to CAN/CGSB 19.24-M.

2.10 Accessories

.1 Polyethylene back-up rope: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa, compatible with primers and sealants, oversized 30 to 50%.

.2 Vent stack covers: telescoping cap and preinsulated flange sleeve of aluminum, sized to suit vents.

.1 Acceptable products: SJ-26/27 by Thaler Roofing Specialties Products Inc., VSC-S Series by Lexsuco.

.2 Install sleeve 3 mm below vent stack and install sealant to vent stack, place cap onto bead of sealant to seal cap to vent stack over flange. Do not seal cap to vent stack until vent stack installation has been inspected.

.3 Roof drain: retrofit drain system consisting of seamless aluminum body, cast-aluminum strainer dome, clamping ring and integral or separate mechanical compression seal; drain size to suit existing drain.

.1 Acceptable products: Hercules Retrodrain with U-Flow seal by OMG Roofing Products, Flash-Tite Superdrain with Maxxflo drain seal by Lexcor.

.4 Cants: premanufactured rigid mineral fibre cant strips having bitumen surfacing for adhering roofing membranes.

.5 Conduit flashing:

.1 Gooseneck design consisting of aluminum pipe flashing welded to aluminum plate deck flange to form water-tight construction.

.2 Pipe diameter and radius to suit size and quantity of conduits. Provide EPDM end cap closure. Provide secondary EPDM seal, similar to end cap closure, at bottom of gooseneck. Holes through end cap and secondary seal to suit conduit.

.3 Deck flange: 6 mm thick aluminum plate, coated with bituminous paint.
.4 Aluminum: 6061-T4 with mill finish.

.6 Split flashing:
.1 Flashing: two-piece flashing with integral deck flange and sloped cap to divert water away from flashing. Secure parts together using stainless steel clips and screws.
.2 Fabricated from: 0.46 mm thick, Type 304 stainless steel to ASTM A240/A240M.
.3 Provide continuous EPDM seal:
.1 Along entire length of seam, including deck flange.
.2 At cap to close-off joint between flashing and penetration.
.4 Size: 305 mm high x diameter/square size to suit.
.5 Coat flange with bituminous paint.
.6 Acceptable Materials: SPJ-Series by Thaler Metal Industries.

.7 Guardrail System:
.1 Freestanding roof edge projection system, including pipe railings, uprights, bases, counterweights, and fittings all sourced from a single manufacturer. Railing to have galvanized finish.
.2 System to be engineered to withstand a minimum load of 200 lbs applied in any direction at any point on the top rail.

.8 Rubberized Pipe Supports
.1 100% recycled, UV resistant rubber support with associated galvanized plates, channels, clips, clamps, and fasteners as required to fully support piping. Materials to be sourced from single manufacturer. Quantity and spacing as required supporting pipe within the rubberized roof top support unit’s maximum load capacity as specified by manufacturer.

.9 Guy Wire Anchor
  .1 Roof mounted anchor: consisting of base unit, eye and aluminum flashing components.
    .1 Base unit: Fabricate from HSS welded to steel base plate. All components galvanized. Fill void in HSS with premoulded polyurethane foam insulation to prevent condensation. Size and thickness of components to suit.
    .2 Eye: forged combination eye and base, welded to base unit; galvanized finish.
    .3 Flashing: weather-resistant spun aluminum sleeve, with internal EPDM seal at base to prevent moisture entry into roofing system and EPDM seal at top to prevent water penetration behind flashing. Coat deck flange with bituminous paint.
    .4 Anchoring method:
      .1 Anchoring components to be stainless steel construction.
      .2 Concrete deck: Thru-bolting using bolt complete with plate, lock washers and nuts.
      .3 Steel deck: bolt-around type using four (4) stainless steel bolts with plate, lock washers and nuts.
    .5 Acceptable Materials: ARS 300 Series by Thaler Metal Industries.
  .2 Hot-dip galvanize items in accordance with ASTM A123/A123M; where possible, galvanize after fabrication.

.10 Securement bar: extruded aluminum.

PART 3 - EXECUTION

3.1 Quality of Work

.1 Do examination, preparation and roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual, except where specified otherwise.

.2 Do priming for asphalt roofing in accordance with manufacturers written instructions.

.3 Fit interface of walls and roof assemblies with durable rigid material, sheet metal or plywood, providing connection point for continuity of air barrier.

3.2 Protection

.1 Cover walls 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 installed and connected.

.5 Protect all roof areas from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.

.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.

3.3 Examination Roof Decks

.1 Notify Departmental Representative 48 hours prior to exposure of existing roof deck and/or removal of roof materials.

.2 Inspect with Departmental Representative roof deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed. Report in writing any defects in structure or differences from details.

.3 Prior to starting work ensure:
- .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
- .2 Cants, curbs, dividers and blocking are secure.
- .3 Roof drains have been installed at proper elevations relative to finished roof surface. Verify that drains are at low point of roof elevation. Notify Departmental Representative if drains are not at proper elevation to allow water drainage.
- .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .5 Members true to line, levels and elevations, square and plumb.
- .6 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .7 Bolts are countersunk where necessary.

.4 Conduit located under metal deck:
- .1 Identify the location of existing conduit below metal deck **prior to** the installation of deck covering so as to avoid damage to wiring and/or conduit.
- .2 To reduce down time to tenants daily operations, have electrician on site during installation of gypsum board to make repairs to wiring/conduit that gets damaged.
- .3 Costs for electrician and repair of wiring/conduit damaged during execution of this work shall be at no increase in contract price.

.5 Do not install roofing materials during rain or snowfall.

3.4 Preparation of Steel Deck

.1 Mechanically fasten deck covering to top flanges of steel deck using screws. A 2440 mm x 1220 mm sheet to have a minimum 10 fasteners per sheet in field of roof, 16 fasteners at perimeters and 32 fasteners in the exterior corners.

.2 Place with long axis of each gypsum sheet transverse to steel deck top flanges, with end joints staggered and fully supported on ribs

3.5 Vapour Retarder

.1 Apply two-ply felt vapour retarder and insulation in accordance with CRCA Specifications SO-VR-1 and CO-VR-1 as required to suit deck.

3.6 Fire Seal Membrane

.1 Install fire seal membrane at all exposed wood and combustibles starting at the vapour barrier and covering the entire curb. Ensure wood is not exposed to flame. Prime wood surface with primer as recommended by manufacture. Fasteners maybe used to ensure a good adherence. Fire seal membrane is an underlay for the standard torch applied base sheet flashing and is to provide a continuous fire seal at wall/curb and roof junctions.

3.7 Roof/Wall Junction

.1 Notify Departmental Representative 48 hours prior to covering thru-wall flashings to allow inspection.

.2 Inspect with the Departmental Representative and examine thru-wall flashings and report in writing any defects in structure or differences from details. Inspection will review water-tightness of membrane at thru-wall prior to installing siding material or masonry and metal flashings.

3.8 Exposed Membrane Roofing Application

.1 Insulation application.

.1 Mop insulation to vapour retarder and where necessary, top layer of insulation to bottom layer with hot asphalt at rate of 1 kg/m^2.

.2 Install tapered insulation as second layer in accordance with shop drawings. Stagger joints between layers 150 mm minimum.

.2 Recovery board application.
  .1 Fully mop recovery board over insulation, with hot asphalt at rate of 1.4 kg/m^2.
  .2 Stagger joints minimum of 25 mm from insulation joints.
  .3 Butt tight to adjacent boards without gaps.

.3 Base sheet application.
  .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
  .2 Unroll and embed base sheet in uniform coating of asphalt applied at rate of 1.2 kg/m^2, at 230°C.
  .3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.
  .4 Application to be free of blisters, wrinkles and fishmouths.

.4 Cap sheet application.
  .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.
  .2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
  .3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm minimum from those in base sheet.
  .4 Application to be free of blisters, fishmouths and wrinkles.
  .5 Do membrane application in accordance with manufacturer's recommendations.

.5 Flashings.
  .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
  .2 Nail and torch flashing base sheet and torch flashing cap sheet onto substrate in 1 metre wide strips.
  .3 Lap flashing base sheet to membrane base sheet minimum 200 mm and seal by mopping or torch welding.

.4 Lap flashing cap sheet to membrane cap sheet 150 mm minimum and torch weld.
.5 Provide 75 mm minimum side lap and seal.
.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
.7 Do work in accordance with manufacturer's recommendations.

3.9 CANTS

.1 Install prefabricated cants over fibreboard overlay and fasten to vertical with 50 mm plate and fasteners spaced a minimum of 400 mm oc.

.2 Angle cut cants to fit tightly on back and bottom where roof to wall angle varies from 90 degrees.

3.10 Roof Penetrations

.1 Vent stack covers
.1 Set in mastic on top of base sheet.
.2 Install reinforcing sheet over flange, ensuring it extends 150 mm beyond.
.3 Torch cap sheet over reinforcing sheet and seal joint between vent stack cover and cap sheet.
.4 Install sleeve 3 mm below vent stack and install sealant to vent stack. Place cap into bead of sealant to seal cap to vent stack cover.
.5 Installation of cap to vent stack cover is to be done after vent stack insulation has been reviewed by the Departmental Representative.

.2 Roof drain:
.1 Insert drain seal in drain stem and tighten enough to hold seal in place.
.2 Install assembled drain into existing leader pipe until flange lies flush on roof membrane.
.3 Secure drain flange to roof deck/nailer using a minimum of three pan-head fasteners, evenly spaced around flange.
.4 Tighten drain seal to provide positive seal

.5 Place clamping ring over metal studs. Install stainless steel nut and lock washers tightening clamping ring against membrane flashing until secure.

.6 Install strainer dome and fasten in place.

.7 Insulate drains using low-expansion foamed-in-place polyurethane insulation.

.3 Conduit flashing:

.1 Set in mastic on top of base sheet.

.2 Install reinforcing sheet over flange, ensuring it extends 150 mm beyond.

.3 Torch cap sheet over reinforcing sheet and seal joint between conduit flashing and cap sheet.

.4 Guy wire anchor:

.1 Install guy wire anchor to existing deck in accordance with manufacturer’s instructions.

.2 Set flashing sleeve on top of base sheet.

.3 Install reinforcing sheet over flange, ensuring it extends 150 mm beyond.

.4 Torch cap sheet over reinforcing sheet and seal joint between flashing sleeve and cap sheet.

.5 Install other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.

3.11 Field Quality Control

.1 Inspection and testing of roofing application may be carried out by testing laboratory designated by Departmental Representative.

Costs of inspection and testing will be paid by Departmental Representative.

3.12 Cleaning

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 06 10 00 - Rough Carpentry: Wood cants and curbs.

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing.

.3 Section 07 92 10 - Joint Sealing.

1.2 References

.1 ASTM International (ASTM).

- .1 ASTM A653/A653M-13, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A924/A924M-13, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .3 ASTM C920-14, Specification for Elastomeric Joint Sealants.
- .4 ASTM F1667-13, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
- .2 CGSB 37-GP-9Ma, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

1.3 Definitions

.1 Custom colours: colours not normally produced by the industry and have not been assigned a "QC" number.

.2 Special colour range: colours produced by the industry that have been assigned a "QC" number, but are more costly to produce than "standard colour range".

.3 Standard colour range: colours produced by the industry that are currently popular and/or cost effective, and have been assigned a "QC" number. Colour is independent of gauge of steel.

.4 Stock colour range: colours stocked by an individual manufacturer for the gauge specified.

1.4 Action and Informational Submittals

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, colour and finish.

.3 Submit shop drawings for metal enclosure and scupper.

1.5 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Prevent contact of dissimilar metals during storage, and protect from corrosive materials and elements.

PART 2 - PRODUCTS

2.1 Metal Materials

.1 Galvanized steel sheet: fabricated in accordance with ASTM A653/A653M, having a core of Grade 230 (33) steel; zinc-coated in accordance with ASTM A924/A924M to a Z275 designation; prefinished with polyester coating system.

.1 Thickness: 0.76 mm base thickness steel.

.2 Aluminum: 0.81 mm embossed aluminum; clear anodized finish.

.3 Stainless steel: 0.46 mm thick, Type 304, 2B finish, to ASTM A240/A240M.

2.2 Accessories

.1 Isolation coating: alkali resistant bituminous paint.

.2 Asphalt primer: to CGSB 37-GP-9M.

.3 Plastic cement: to CAN/CGSB-37.5-M.

.4 Cleats/hook strip: of same material and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

.5 Fasteners: to ASTM F1667, flat head roofing nails, of length and thickness suitable for flashing application; of same material as sheet metal.

.6 Washers: of same material as sheet metal, 1.6 mm with rubber packings.

.7 Exposed screws: zinc coated steel, head colour same as exterior sheet, dished steel/neoprene washer; 25 mm long.

.8 Sealant: silicone, to ASTM C920, Type S, Grade NS, uses NT, G, M, A and O.

2.3 Finishes

.1 Silicone modified polyester.
- .1 Acceptable products: WeatherX by VicWest, Perspectra Series by Dofasco, Perspectra Series by Baycoat.
- .2 Coating thickness: exposed surface 0.025 mm ± 0.002 mm; unexposed surface to have washcoat finish.
- .3 Colour: as selected by Departmental Representative from custom range.

.2 Aluminum - Anodized:
- .1 Clear anodized: give exposed aluminum surfaces an anodic oxide treatment to obtain an Aluminum Association Architectural Class 1 coating (0.0007); designation AAM12C22A41. Properties of finish shall meet coatings requirements of AAMA/WDMA/CSA 101/I.S.2/A440.

2.4 Fabrication

.1 Fabricate metal flashings to profiles indicated.

.2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.

.3 Hem exposed edges on underside 13 mm. Miter and seal corners with sealant.

.4 Use flat lock seam joints, unless otherwise shown.

.5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.5 Scupper

.1 Form scupper to profiles shown.

.2 Scupper to be of all welded, one-piece construction. Miter corners.

2.6 Metal Enclosure

.1 Fabricated from stainless steel to dimensions indicated.

.2 Use multi-piece construction to fit over existing piping and form weathertight seal.

PART 3 - EXECUTION

3.1 Manufacturer's Instructions

Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Installation

.1 Install flashings as detailed.

.2 Use prefinished galvanized steel flashings where existing flashing was prefinished; aluminum flashings where existing flashings were aluminum.

.3 Coat flanges of flashing with asphalt primer before embedding into roofing.

.4 Nail flashing at 150 mm o.c.; stagger nails.

.5 Use concealed fastenings except where approved before installation.

.6 Provide lock seam joints for all flashing at 2400 mm sections and lock seam slip joints every 4800 mm. Provide lock seam joints at exterior corners. Apply sealant to completely fill joints.

3.3 Scuppers

.1 Install scuppers as indicated.

3.4 Adjust and Clean

.1 Clean all flashing surfaces after installation. Do not use solvents detrimental to roofing membrane or roofing components.

.2 Remove all fasteners, metal clippings, etc., from roof surfaces and site.

END OF SECTION

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 07 52 00 - Modified Bituminous Membrane Roofing: caulking associated with roofing.

.2 Section 07 62 00 - Sheet Metal Flashing and Trim: caulking associated with metal flashings..

1.2 References

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

1.3 Submittals

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's product shall describe.
- .1 Required primers.
- .2 Sealing compound.

.3 Submit manufacturer's instructions for each product used.

1.4 Delivery, Storage, and Handling

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.5 Project Conditions

.1 Environmental Limitations:
- .1 Do not proceed with installation of joint sealants under following conditions:
  - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 5°C.
  - .2 When joint substrates are wet.

.2 Joint-Width Conditions:
- .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:
.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 Environmental Requirements

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

PART 2 - PRODUCTS

2.1 Sealant Materials

.1 Sealants and caulking compounds shall:
.1 meet or exceed all applicable governmental and industrial safety and performance standards; and
.2 be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the fisheries Act and the Canadian Environmental Protection Act (CEPA).

.2 Sealant and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium or their compounds, except barium sulfate.

.3 Sealant and caulking compounds must contain total VOC content (volatile organic compounds) that do not exceed the requirements of the California South Coast Air Quality Management District (SCAQMD) Rule #1168.

.4 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.

.5 In the selection of the products and materials of this section preference will be given to those with the following characteristics: Water based, water soluble, water clean-up, non-flammable, low Volatile Organic Compound (VOC) content, manufactured without compounds which contribute to ozone depletion in the upper atmosphere, manufactured without compounds which contribute to smog in the lower atmosphere, does not contain methylene chloride, does not contain chlorinated hydrocarbons.

2.2 Sealant Material Designations

.1 Urethanes Two Part.
- .1 Non-Sag to CAN/CGSB 19.24, Type 2, Class B.
- .2 Colour: as selected by Departmental Representative.

.2 Preformed Compressible and Non-Compressible back-up materials.
- .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
  - .1 Extruded closed cell foam backer rod.
  - .2 Size: oversize 30 to 50 %.
- .2 Bond Breaker Tape.
  - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 Joint Cleaner

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

PART 3 - EXECUTION

3.1 Protection

.1 Protect installed Work of other trades from staining or contamination.

3.2 Surface Preparation

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 Priming

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 Backup Material

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 Mixing

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 Sealant Application

.1 Apply sealant where indicated.

.2 Apply sealant in accordance with manufacturer's written instructions.

.3 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.4 Apply sealant in continuous beads.

.5 Apply sealant using gun with proper size nozzle.

.6 Use sufficient pressure to fill voids and joints solid.

.7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.8 Tool exposed surfaces before skinning begins to give slightly concave shape.

.9 Remove excess compound promptly as work progresses and upon completion.

3.7 Curing

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.8 Cleanup

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION