Part 1 General

1.1 SECTION INCLUDES

.1 Cold applied asphalt bitumen dampproofing

.2 Protection boards

1.2 RELATED REQUIREMENTS

.1 Section 07 21 13 - Board Insulation: Perimeter and horizontal insulation

.2 Division 31 - Earthwork: Backfilling

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM D4479/D4479M-07(2012)e1 - Standard Specification for Asphalt Roof Coatings—Asbestos-Free

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.16-M89, Filled, Cutback, Asphalt for Dampproofing and Waterproofing

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide properties of primer, bitumen, and mastics.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.7 SITE CONDITIONS

.1 Ambient Conditions: temperature, relative humidity, moisture content.

.1 Apply dampproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

.2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.

.3 Maintain air temperature and substrate temperature at dampproofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.

.4 Do not apply dampproofing in wet weather.

Part 2 Products

2.1 MANUFACTURERS

.1 Manufacturers/Products:

.1 Henry Company; Dampproofing Bakor 710-11 Premium Grade Foundation Coating

.2 WR Meadows; 501 Dampproofing.

2.2 MATERIALS

.1 Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide auxiliary materials recommended in writing by manufacturer of primary materials.

.2 Asphalt: to CAN/CGSB-37.16 or ASTM D4479/4479M, Type I.

.3 Auxiliary Materials:

.1 Emulsified-Asphalt Primer: to CAN/CGSB-37.2, except diluted with water as recommended in writing by manufacturer.

.2 Patching Compound: latex-modified repair mortar or asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.

.3 Open Weave Asphalt-Coated Glass Fabric: to CGSB-37-GP-63M.

2.3 ACCESSORIES

.1 Protection Board: Rigid insulation specified in Section 07 21 13.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verification of existing conditions before starting work.

.2 Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

.3 Verify items which penetrate surfaces to receive dampproofing are securely installed.

3.2 PREPARATION

.1 Protect adjacent surfaces not designated to receive dampproofing.

.2 Clean and prepare surfaces to receive dampproofing to manufacturer's written instructions.

.3 Do not apply dampproofing to surfaces unacceptable to applicator.

.4 Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

.5 Apply patching compound to patch and fill tie holes, and other imperfections; cover with asphalt-coated glass fabric.

3.3 APPLICATION

.1 Prime surfaces to manufacturer's written instructions at a rate of 2 to 8 sq m/L. Permit primer to dry.

.2 Apply bitumen dampproofing to manufacturer's written instructions using brush or spray application.

.3 Apply bitumen in one coat, continuous and uniform, at a rate of 1.5 L/sq m.

.4 Apply from 50 mm below finish grade elevation to bottom of grade beam.

.5 Apply additional coat of dampproofing to vertical corners and construction joints for a minimum width of 230 mm on each side.

.6 Seal items projecting through dampproofing surface with mastic. Seal watertight.

3.4 INSTALLATION - PROTECTION BOARD

.1 Place protection board directly against damproofing; butt joints.

.2 Adhere protection board to substrate with mastic or to tacky dampproofing surface. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Board insulation at exterior walls and soffits, perimeter foundation wall, and horizontal below grade insulation.

1.2 RELATED REQUIREMENTS

.1 Section 07 42 43 - Composite Wall Panels

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing: Rigid insulation at roof system.

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM A123A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.2 ASTM C177-13, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

.3 ASTM C518-15, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

.4 ASTM C1104/C1104M-13a, Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation

.5 ASTM C1289-15, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering

.2 CAN/ULC-S702-14, Standard for Thermal Insulation Mineral Fibre for Buildings

.3 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced

.4 CAN/ULC-S114-05, Standard Method of Test for Determination of Non-Combustibility in Building Materials

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data on product characteristics, performance criteria, limitations and installation requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.6 SITE CONDITIONS

.1 Ambient Conditions:

.1 Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

Part 2 Products

2.1 INSULATION MATERIALS

.1 Mineral Fibre Insulation: non-combustible, semi-rigid mineral wool fibre insulation board to CAN/ULC-S702, thickness and number of layers indicated.

.1 Type 1.

.2 Density:

.1 Outer layer: 100 kg/m^3.

.2 Inner layer: 55 kg/m^3.

.3 Thermal resistance per 25 mm thickness: 0.76 m^2 K/W (R-4.2 per inch).

.4 Moisture resistance: 0.07% to ASTM C1104.

.5 Fire performance:

.1 Non-combustible to CAN/ULC-S114.

.2 Smoke developed: 0 to CAN/ULC S102.

.3 Flame spread: 0 to CAN/ULC S102.

.6 Manufacturer/Product:

.1 Roxul CavityRock DD.

.2 Polyisocyanurate Insulation (Faced): to ASTM C1289 Type II Class 2, Grade 2, or CAN/ULC-S704, Type 2, Class 3, closed cell insulation conforming to the following:

.1 Compressive Strength: 140 kPa.

.2 Thermal Resistance: Aged RSI-1.05 per 25 mm.

.3 Facing: Factory applied facing of coated glass facer on both faces.

.4 Board Size: 610 wide by 2440 mm long.

.5 Board Thickness: indicated.

.6 Board Edges: Square.

.7 Flame/Smoke Properties: <25 flame spread, <450 smoke developed CAN/ULC-S102.

.3 Extruded Polystyrene Insulation (XPS): to CAN/ULC-S701, thickness indicated.

.1 Type: 4.

.2 Compressive strength: minimum 200 kPa.

.3 Thickness: indicated.

.4 Thermal Resistance per 25 mm thickness: minimum 0.87 m^2 C/W when tested in accordance with ASTM C177 or ASTM C518.

.5 Edges: shiplapped.

.6 Location: below grade.

.7 Manufacturers/Products:

.1 Dow; Styrofoam SM.

.2 Owens Corning; Celfort C-300.

.4 Concrete-Faced Extruded Polystyrene Board Insulation: to CAN/ULC-S701, with 8 mm thick factory-applied latex-modified concrete facing.

.1 Type: 4.

.2 Compressive strength: minimum 200 kPa.

.3 Thickness: indicated.

.4 Thermal Resistance per 25 mm thickness: minimum 0.87 m^2 C/W when tested in accordance with ASTM C177 or ASTM C518.

.5 Edges:

.1 Short: square.

.2 Long: tongue and groove.

.6 Accessories: purpose-made galvanized steel mounting clips and fasteners.

.7 Location: Perimeter foundations.

.8 Manufacturers/Products:

.1 Tech-Crete; CFI Concrete Faced Insulated Wall Panels

2.2 ADHESIVE MATERIALS

.1 Adhesive for Bonding XPS Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates, compatible with dampproofing.

2.3 ACCESSORIES

.1 Mounting Clips: galvanized steel to ASTM A123M, Z275 coating designation, preformed by concrete-faced insulation manufacturer, complete with corrosion-resistant masonry fasteners.

.2 Trim, Closure Pieces, Flashings: Brake formed to required profiles

.3 Insulation Fasteners: Impale type fasteners constructed of corrosion-resistant metal spindle and base. Spindle length to suit insulation thickness.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that substrate, adjacent materials, and dampproofing are dry and ready to receive insulation and adhesive.

.3 Verify substrate surface is flat, free of irregularities and materials or substances that may impede adhesive bond.

3.2 INSTALLATION GENERAL

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep combustible insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Fasten insulation in place using method applicable to substrate..

.7 Offset both vertical and horizontal joints in multiple layer applications.

.8 Leave insulation board joints unbonded over line of expansion and control joints. Bond continuous 150 mm wide 0.15 mm polyethylene strip over expansion and control joints using compatible adhesive before application of insulation.

.9 Butt insulation tightly together at side and end laps and fill voids entirely with spray-foam sealant to provide complete thermal barrier.

.10 Do not enclose insulation until it has been reviewed by Contract Administrator.

3.3 INSTALLATION – EXTERIOR WALLS

.1 Use impale fasteners long enough to accommodate both mineral wool and polyisocyanurate insulation.

.2 Provide number of fasteners in accordance with insulation manufacturers' recommendations.

.3 Mechanically fasten backing plate of impale fastener to framing through air/vapour barrier membrane. Apply patch of self-adhesive air/vapour barrier over impale fastener backing plate covering fasteners.

.4 Completely fill space between thermal spacers with mineral wool insulation applied in single layer.

.5 Install polyisocyanurate insulation between vertical sub-framing attached to thermal spacers.

3.4 INSTALLATION - FOUNDATION PERIMETER

.1 Below Grade:

.1 Adhere boards on vertically on grade beam to depth indicated

.2 Apply insulation adhesive to insulation board by bead method with 6 mm diameter beads 150 mm o.c. in serpentine pattern horizontally across full board. Apply adhesive fully around protrusions.

.3 Stagger side and end joints. Butt edges and ends tight to adjacent boards.

.4 Cut and fit insulation tight to protrusions or interruptions to insulation plane.

.5 Loose lay boards extending horizontally as indicated. Place boards in a method to maximize contact with bedding.

.2 Above Grade:

.1 Install concrete faced insulation in vertical orientation using galvanized clips and fasteners in accordance with manufacturer's instructions.

.2 Align top edges of panels.

.3 Fully embed prongs on mounting clips into insulation.

.4 Locate cut panels at corners. Minimum size of cut panel: 150 mm wide.

.5 Cut panels to fit snugly around penetrations. Provide flashing or apply backer rod and sealant around penetrations.

.6 Outside corners: Fasten panels with surface mounted fasteners and cover with J-shape purpose made flashing.

3.5 PROTECTION OF FINISHED WORK

.1 Do not permit work to be damaged prior to covering insulation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Batt thermal insulation.

1.2 RELATED REQUIREMENTS

.1 Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation.

1.3 REFERENCES

.1 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

.2 CAN/ULC-S114-05 - Standard Method of Test for Determination of Non-Combustibility in Building Materials

.3 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings (Includes Amendment 1, 2012)

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 19: Project Meetings.

.2 Coordination:

.1 Coordinate with other work having a direct bearing on work of this section.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data on product characteristics.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Insulation: CAN/ULC-S702, preformed mineral fibre, in batt form; friction fit conforming to the following:

.1 Thermal Resistance: RSI-0.70 per 25 mm thickness.

.2 Batt Size: to fit stud spacing.

.3 Facing: Unfaced.

.4 Flame/Smoke Properties: 0/0 to CAN/ULC-S102, non-combustible to CAN/ULC S114.

.5 Manufacturer/Product:

.1 Roxul; Comfortbatt

.2 Owens Corning; Thermafiber SAFB.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

.1 Install in exterior parapets between framing members without gaps or voids. Do not compress insulation.

.2 Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

.3 Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Below grade vapour retarder (referred to as 10 mil poly on the Drawings)

1.2 RELATED REQUIREMENTS

.1 Section 03 45 00 - Precast Architectural Concrete: Paving slabs

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM E1643-11, Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

.2 ASTM E1745-11 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 19: Project Meetings.

.2 Coordination: Coordinate with other work having a direct bearing on work of this section.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data indicating material characteristics and performance criteria.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 SHEET MATERIALS

.1 Underslab Vapour Retarder (referred to as 10 mil poly on the Drawings): To ASTM E1745, Class A, 0.254 mm thick.

.2 Manufacturer/Product:

.1 Stego; Stego Wrap (10 mil) Vapor Barrier.

.2 WR Meadows; Perminator 10.

.3 Layfield; VaporFLEX 10.

2.2 ACCESSORIES

.1 Joint sealing tape: Air resistant pressure sensitive adhesive tape, type recommended by vapour retarder manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.

Part 3 Execution

3.1 EXAMINATION

.1 Examine areas and conditions under which work is to be performed.

.1 Inform Contract Administrator of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied.

.2 Verify sub-grade is properly prepared and at correct elevation, level, smooth without sharp projections that could puncture underslab vapour retarder.

.3 Start of Work implies acceptance of conditions.

3.2 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion.

3.3 INSTALLATION

.1 Install underslab vapour retarder in accordance with requirements of ASTM E1643.

.2 Use sheets of largest practical size to minimize joints. Lap joints 300 mm and tape continuously.

.3 Seal vapour retarder to grade beams, and around penetrations using continuous joint sealing tape.

.4 Fasten and seal vapour retarder to inside face of grade beam as indicated.

.5 Inspect for continuity and repair in accordance with ASTM E1643 and as follows.

.1 Repair small punctures and tears with sealing tape before work is concealed.

.2 Where damage to vapour retarder exceeds tape width, repair with additional layer of vapour retarder, minimum 300 mm overlap in all directions from edge of damage.

.1 Tape continuously around perimeter of patch.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Membrane air/vapour barrier, vapour permeable air barrier, and air seal materials to connect and seal openings, joints, and junctions between other air seal materials and assemblies.

1.2 RELATED REQUIREMENTS

.1 Section 07 11 13 - Bituminous Dampproofing: Below grade dampproofing membrane

.2 Section 07 21 13 - Board Insulation

.3 Section 07 52 00 - Modified Bituminous Membrane Roofing: Roofing membrane and vapour retarder

.4 Section 08 44 30 - Structural Sealant Glazed Assemblies: Functioning as a primary air seal

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM A653/A653M-13 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

1.4 DEFINITIONS

.1 Air Barrier: A continuous network of materials and joints providing air tightness, with adequate strength and stiffness to not deflect excessively under air pressure differences, to which it will be subjected in service. It can be comprised of a single material or a combination of materials to achieve the performance requirements.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 19: Project Meetings.

.2 Pre-installation meetings: Schedule pre-installation meeting with Contractor, installer, manufacturer, Contract Administrator, and necessary parties to review and discuss project conditions. Conduct pre-installation meeting minimum one week before starting air/vapour barrier work and on-site installations to:

.1 Verify project requirements.

.2 Verify substrate conditions.

.3 Co-ordinate products, installation methods and techniques.

.4 Sequence work of related sections, including but not limited to structural-support framing, window system, and roofing.

.5 Co-ordinate with other building subtrades.

.3 Coordination: Sequence work to permit installation of materials in conjunction with related materials and seals.

1.6 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: For each type of product.

1.7 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Installer Qualifications.

.3 Statement of Compatibility: Provide letters, provided and signed by manufacturer of membrane air/vapour barrier materials, and air barrier materials, that products used on the project are compatible with adjacent materials, and materials with which the membranes will be in contact or sealed.

.4 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in Article FIELD QUALITY CONTROL.

1.8 QUALITY ASSURANCE

.1 Installer Qualifications: Company specializing in performing work of this section with minimum 5 years' experience with installation of air/vapour barrier systems, trained and approved by manufacturer.

.2 Manufacturer's Services: as part of membrane manufacturers' services specified in Article FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.

.2 Minimum one time during progress of Work.

.3 Upon completion of Work, after cleaning is carried out.

1.9 MOCK-UP

.1 Section 01 45 00: Provide mock-up of air barrier system, which is comprised of a variety of materials.

.2 Construct typical exterior wall panel, 3 m by 3 m wide, including illustrating materials interface and seals, including lap joints, flashing details, and tie-in conditions to roof vapour retarder, and curtain wall framing, and door frames.

.3 Locate where directed by Contract Administrator.

.4 Approved mock-up may remain as part of the Work.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.11 SITE CONDITIONS

.1 Ambient Conditions:

.1 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

Part 2 Products

2.1 SHEET MATERIALS

.1 Air/Vapour Barrier (on warm side of insulation): Thermofusible modified bitumen, glass reinforced, minimum total thickness 2.5 mm.

.1 Manufacturer/Product:

.1 Henry; Blueskin TG.

.2 IKO; AquaBarrier TG.

.3 Soprema; Sopraseal 60 FF.

.2 Air Barrier (on cold side of insulation): Self-adhering vapour-permeable air barrier membrane consisting of a breathable carrier film with specially designed adhesive, which permits transfusion of water vapour; minimum .

.1 Manufacturer/Product:

.1 Henry; VP160.

.2 Grace; Perma-A-Barrier VPS.

2.2 ACCESSORIES

.1 Sheet Steel Transition Strip: 1.01 mm thick, zinc coated, cold rolled steel sheet, with Z275 designation coating to ASTM A653/A653M.

.2 Through-Wall Flashings: Self-adhering SBS modified bitumen integrally laminated to cross laminated polyethylene film, minimum 1.0 mm thick, compatible with air/vapour barrier membrane and air barrier membranes.

.3 Silicone Transition Strip: flexible silicone sheet air and vapour barrier with preformed corner pieces.

.1 Dimensions: 1.6 thick by 152 mm wide sheets.

.2 Hardness, to ASTM D2240, Type A Durometer: 43.

.3 Tensile strength to ASTM D412: 7.8 MPa.

.4 Ultimate elongation to D412: 550%.

.5 Adaptors: extruded aluminum profiles for connection to curtain wall framing, as required by silicone transition strip manufacturer's system.

.6 Corners: premoulded silicone sheets formed for corner conditions.

.7 Sealant: Manufacturer's recommended structural silicone. Confirm compatibility of silicone sheet with overlapping materials.

.8 Location: transitions between envelope components to maintain continuity of air/vapour barrier, except where using sheet steel transition strip.

.9 Manufacturers/Products:

.1 Tremco; Silicone Extruded Sheet.

.2 Dow Corning; STS.

.4 Sealant: butyl rubber base, single component, solvent release, non-skinning, as recommended by membrane manufacturers.

.5 Substrate Cleaner: Non-corrosive type recommended by membrane manufacturers compatible with adjacent materials.

.6 Primer: Liquid waterborne primer recommended for substrate by air/vapour barrier and air barrier material manufacturers applicable to specific substrate.

.7 Termination Mastic: rubberized asphalt-based mastic.

.8 Surface Conditioner: Latex-based, water-dispersible liquid for substrate preparation, as recommended by membrane manufacturer.

.1 Flash point: no flash to boiling point.

.2 Solvent type: water.

.3 Application temperature: minus 4 deg C and above.

.9 Foam Seal: One- or two-component, foamed-in-place, polyurethane foam sealant, CFC-free, no added urea formaldehyde, non-shrinking after cure, CCMC listed.

.1 Location: for use around perimeter of window and door frames, and other exterior wall penetrations.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that surfaces and conditions are ready to accept the Work of this section.

3.2 FIRE PROTECTION

.1 Before start of work, conduct establish safe working practices and ensure procedures minimize risk of fires.

.2 At the end of each workday, use a heat detector gun to spot any smouldering or concealed fire. Remain at Project Site minimum one hour after torch application.

.3 Never apply torch directly to wood surfaces.

.4 Throughout membrane installation, maintain clean site. Have one approved ABC fire extinguisher within 6 metres of each propane torch. Do not place torches near combustible or flammable products. Do not use torches where flame is not visible or cannot be easily controlled.

3.3 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion of materials.

.2 Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air/vapour barrier application.

.3 Bridge and cover discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints.

.4 At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

.5 Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with galvanized-steel sheet mechanically fastened to structural framing to provide continuous support for air/vapour barrier.

.6 Take precautions using open flame propane torch. Protect high flash and flammable adjacent materials.

3.4 INSTALLATION – AIR/VAPOUR BARRIER MEMBRANE

.1 Install modified bituminous sheets and accessory materials according to manufacturer's written instructions and according to recommendations in ASTM D 6135.

.2 Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air/vapour barrier membrane on same day. Reprime areas exposed for more than 24 hours.

.1 Prime glass-fibre-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

.3 Torch weld membrane air/vapour barrier to dry surfaces at air and surface temperatures of minus 4 deg C and above in accordance with manufacturer's recommendations, to locations indicated.

.4 Precut pieces of membrane air/vapour barrier into easily-handled lengths. Minimize joints.

.5 Remove release paper where applicable, and position membrane carefully before placing length horizontally against substrate.

.6 Start installation at base of wall placing bottom edge of membrane over sheet metal flashings, and shelf angles, as indicated.

.7 When properly positioned, place against surface. Press firmly into place and roll to ensure full contact.

.8 Overlap adjacent pieces 75 mm, and roll seams.

.9 Apply subsequent sheets of membrane above, overlapping sheet below by 75 mm. Stagger vertical joints minimum 300 mm. Roll firmly into place.

.10 Slit membrane air/vapour barrier at penetration locations. Seal around penetrations with termination mastic. Extend out 50 mm onto protruding member.

.11 Continue membrane air/vapour barrier into openings in walls, including but not limited to doors and windows. Terminate at points that will prevent visibility from interior.

.12 Continue membrane air/vapour barrier over junctions, at changes in wall construction, and other construction. Reinforce corners with additional piece of membrane air/vapour barrier cut and formed to seal corners. Caulk to ensure complete seal. Position lap seal over firm bearing.

.13 Apply sealant within manufacturer’s recommended application temperature range.

.14 At end of each Working Day seal top edge of membrane air/vapour barrier to substrate with termination mastic.

.15 Do not allow rubberized asphalt surface of membrane air/vapour barrier to come in contact with polysulfide sealants, creosote, uncured coal tar products or EPDM.

.16 Do not expose membrane air/vapour barrier to sunlight for more than thirty days prior to enclosure.

.17 Inspect installation prior to enclosing. Repair punctures, damaged areas and inadequately lapped seams with a patch of membrane air/vapour barrier sized to extend 150 mm in all directions from perimeter of affected area.

.18 Ensure membrane air/vapour barrier is free of folds, bubbles and fish mouthing.

.19 Lap flashings with full contact on to surfaces as follows:

.1 Sheet laps: 75 mm minimum.

.2 On to walls or columns: 100 mm minimum.

.3 On to roofs and horizontal surfaces: 150 mm minimum.

.4 On to metal frames in openings: 38 mm.

3.5 INSTALLATION – AIR BARRIER

.1 Apply self-adhesive air barrier on exterior surface of polyisocyanurate insulation, in accordance with air barrier manufacturer's instructions.

.2 Prime substrate to receive air barrier membrane in accordance with manufacturer's written instructions.

.3 Precut pieces of membrane air barrier into easily-handled lengths. Minimize joints.

.4 Remove release paper, and position membrane carefully before placing length horizontally against substrate.

.5 Apply in shingle fashion starting at base of wall.

.6 When properly positioned, place against surface. Press firmly into place and roll to ensure full contact.

.7 Overlap adjacent pieces 50 mm, and roll seams.

.8 Apply subsequent sheets of membrane above, overlapping sheet below by 50 mm. Stagger vertical joints minimum 300 mm. Roll firmly into place.

.9 Slit air barrier at penetration locations. Seal around penetrations with penetration and termination mastic.

.10 Apply air barrier to cover vertical flashing with minimum 100-mm overlap unless otherwise indicated.

.11 At end of each Working Day seal top edge of air barrier to substrate with termination mastic.

.12 Do not expose air barrier membrane to sunlight for more than manufacturer's recommended time limit.

.13 Inspect installation prior to enclosing. Repair punctures, damaged areas and inadequately lapped seams with a patch of air barrier sized to extend 150 mm in all directions from perimeter of affected area.

3.6 INSTALLATION – SHEET STEEL TRANSITION STRIP

.1 Roof/Wall Transition: Fasten sheet steel, bent to shape required, to roof and wall substrates. Length of legs minimum 300 mm each direction.

.2 Butt Joints:

.1 Clean and prime steel substrate to receive membrane air/vapour barrier in accordance with manufacturer's instructions.

.2 Apply 150 mm wide strip of membrane air/vapour barrier along joints.

.3 Roll firmly into place.

.3 Apply 150 by 150 mm patch of self-adhesive membrane air/vapour barrier over fasteners.

.4 Stagger joints in L-shape transition strip with joints in wall air/vapour barrier.

.5 Locations: for use at roof/wall intersection for lapping roof vapour retarder, and wall air/vapour barrier membrane, and as indicated.

3.7 INSTALLATION – SILICONE TRANSITION STRIP

.1 Apply silicone transition strip at joints between exterior wall components to maintain continuity of air/vapour seal in accordance with specified performance requirements.

.1 Capture and seal flexible seal at curtain wall systems with purpose-made adaptor fastened and sealed to side of framing.

.2 Seal transition strip to adjacent construction with not less than 75 mm lap using silicone.

.3 Install purpose made corner pieces of transition strip and seal to adjacent construction.

.4 Minimize joints in transition strip material.

.5 Lap end joints minimum 150 mm and seal.

.2 Inspect installation prior to enclosing. Repair punctures, damaged areas and inadequately lapped seams with a patch of transition strip sized to extend 150 mm in all directions from perimeter of affected area.

3.8 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from air/vapour barrier membrane manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as specified in article SUBMITTALS FOR INFORMATION.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as specified in article QUALITY ASSURANCE.

3.9 PROTECTION OF FINISHED WORK

.1 Do not permit adjacent work to damage work of this section.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Composite metal panel (CMP) cladding, cladding support system, and related flashing and trim.

.2 Engineered, tested, thermally-isolated, rainscreen support system, referred to on the drawings as “fibreglass thermal spacer”.

1.2 RELATED REQUIREMENTS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 27 00 - Air/Vapour Barriers: for membrane air/vapour barrier installed behind thermal spacers

1.3 REFERENCES

.1 American Architectural Manufacturers Association (AAMA):

.1 AAMA 620-05, Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates

.2 ASTM International, (ASTM)

.1 ASTM D2244-11, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation meetings: Schedule pre-installation meeting with Contractor, installer, manufacturer, Contract Administrator, and necessary parties to review and discuss project conditions. Conduct pre-installation meeting minimum one week before starting metal wall panel work and on-site installations to:

.1 Verify project requirements.
.2 Verify substrate conditions.
.3 Co-ordinate products, installation methods and techniques.
.4 Sequence work of related sections, including but not limited to structural-support framing, air/vapour barrier, exterior cladding, curtain wall and window systems.
.5 Co-ordinate with other building subtrades.
.6 Review manufacturer's installation instructions.
.7 Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
.8 Review flashings, special cladding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.

.2 Coordination:

.1 Coordinate metal wall panel assemblies with rain drainage work, flashing, trim, and construction of girts, and other adjoining work to provide leakproof, secure, and non-corrosive installation.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Submit manufacturer's printed product literature, specifications and datasheets. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of composite metal panel, cladding support system, and accessory.

.3 Shop Drawings:

.1 Show fabrication and installation layouts of composite metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, cladding support system, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish among factory-, shop-, and field-assembled work.

.2 Include details of the following accessories, minimum drawing scale 1:10.

.1 Flashing and trim.

.2 Anchorage system.

.3 Stamp and sign each shop drawing by licensed professional engineer registered in Province of Manitoba.

.4 Samples for Initial Selection: For each type of composite metal panel with factory-applied colour finishes.

.1 Include similar samples of trim and accessories involving colour selection.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Installer’s qualifications.

.3 Delegated-Design Submittal: For composite metal panel assembly and support system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 CLOSEOUT SUBMITTALS

.1 Submit manufacturer’s data sheets including care and recommended maintenance procedures for incorporation into Operation and Maintenance Manuals.

.2 Submit copies of manufacturer’s warranties.

1.8 QUALITY ASSURANCE

.1 Installer Qualifications: An employer of workers trained and approved by manufacturer.

1.9 MOCK-UP

.1 Section 01 45 00: Requirements for mock-up.

.1 Construct integrated exterior mock-ups of composite metal wall panel assembly and adjacent curtain wall assembly where directed by Contract Administrator.

.2 Include vertical joint between MCP panels.

.2 Approved mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle materials in accordance with site and environmental conditions and in accordance with manufacturer's instructions.

.2 Package panels for protection during transportation and handling.

.3 Unload, store, and erect CMP in a manner to prevent bending, warping, twisting, and surface damage.

.4 Store CMP vertically, covered with suitable weathertight and ventilated covering. Store CMP to ensure dryness, with positive slope for drainage of water. Do not store CMP in contact with other materials that might cause staining, denting, or other surface damage. Do not allow storage space to exceed 49 deg C.

.5 Retain strippable protective covering on CMP for period of installation.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.12 AMBIENT CONDITIONS

.1 Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal wall panels to be performed according to manufacturers' written instructions and warranty requirements.

.2 Field Measurements: Verify locations of structural members by field measurements before CMP fabrication and indicate measurements on Shop Drawings.

1.13 WARRANTY

.1 Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of CMP assemblies that fail in materials or workmanship within specified warranty period.

.1 Failures include, but are not limited to, the following:

.1 Structural failures.

.2 Exposed panel finish deviation greater than 5 Delta E units from the original colour according to ASTM D2244.

.3 Delamination.

.4 Checking, crazing, adhesion loss.

.2 Warranty period: 10 years from date of Substantial Performance.

Part 2 Products

2.1 SYSTEM DESCRIPTION

.1 Design and Performance Requirements:

.1 General Performance: CMP assemblies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

.2 Delegated Design: Design CMP assemblies, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

.3 Thermal Movements: Design CMP to provide for thermal movement of component materials caused by ambient temperature range of 65 degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

.1 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.4 Structural Performance:

.1 Deflection limits: Design members to withstand dead load, and wind and suction loads calculated in accordance with NBC and applicable local regulations, to maximum allowable deflection of L/180 of span.

.2 Wind Loads: Determine loads based on minimum design wind pressures indicated.

.5 Rain Screen Design: Design ventilating system assembly to accommodate movement of air movement into the rain screen cavity and move water vapour out.

.6 Air Infiltration: Permeance through wall system not to exceed 0.0003 $m^3/s/m^2$ of wall area when tested to ASTM E283, at a pressure differential of 75 Pa.

.7 Water Penetration under Static Pressure: no water penetration when tested to ASTM E331, at a pressure differential of 300 Pa.

.8 Design wall system to accommodate specified erection tolerances of structure.

.9 Thermal Barriers: Thermally isolate metal components from each other and support wall.

.10 Thermally isolate fasteners from metal using thermal isolation washers or other means.

.11 Assume overall responsibility for façade engineering, including, but not limited to:

.1 Determining sizes of load-bearing members.

.2 Determining fastening details to sub-framing and panels.

2.2 COMPOSITE METAL PANELS

.1 General: Provide factory-formed and -assembled, CMP fabricated from two metal facings bonded, using no glues or adhesives, to solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment system components and accessories required for dry-joint weathertight system.

.2 CMP: Formed with 0.50-mm- thick, coil-coated aluminum sheet facings.

.1 Panel Thickness: 4 mm.

.2 Core: Standard.

.3 Exposed Coil-Coated Finish: Mica Fluoropolymer to AAMA 620. 2-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. Colour: based on Alpolic Mica Anodic Clear.

.4 Concealed Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.013 mm.

.5 Manufacturer/Products:

.1 Alucobond; AP300 Dry Joint System.

.2 Alpolic/PE ACM Rainscreen System.

.3 Flynn; Accumet 2000.

.4 Alcotex; Rainscreen III.

.5 Alucoil; Rainscreen, pressurized dry-joint system.

.3 Attachment System Components: Formed from extruded aluminum.

.1 Manufacturer's standard perimeter extrusions with integral weatherstripping, panel stiffeners, panel clips, and anchor channels.

.4 Joint Inserts: Matching CMP.

.5 Panel Accessories: manufacturer’s standard as follows:

.1 Wall Panel and Soffit Accessories: Provide components required for a complete composite metal wall panel assembly including trim, copings, fascia, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of composite metal wall panels unless otherwise indicated. Provide perforated spline in soffit panel assembly.

.2 Stiffeners: Provide concealed stiffeners on back of panels to keep trueness and flatness of panel face.

.3 Flashing: Formed from 0.102-mm minimum thickness, prefinished aluminum. Provide flashing as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, framed openings.

.6 Isolation coating: alkali resistant bituminous paint.

2.3 CLADDING SUPPORT SYSTEM

.1 Thermally Improved Cladding Support System: Fibreglass spacer depth to suit insulation thickness, for structural attachment to building frame, designed to accept Z-bars.

.1 Acceptable Products: Cascadia Clip by Cascadia Windows Inc.

.2 Z-Bars: Nominal 1.5 mm minimum base metal thickness or as required to meet performance requirements, structural quality steel to ASTM A653, with Z275 zinc coating. Flange face: 38 mm. Outer layer of Z-bars adjustable depth. Nominal depth indicated.

.3 Fasteners: Heat-treated corrosion-resistant coated steel fasteners, of type, size, holding-power, and other properties required to fasten support system to substrate.

.1 Steel Stud Substrates: self-drilling screw fastener with hex head.

.4 Galvanic Protection: use tapes and other methods as necessary to separate and prevent contact between dissimilar metals.

2.4 FABRICATION

.1 CMP: Factory form panels in a continuous process with no glues or adhesives between dissimilar materials. Trim and square edges of sheets with no displacement of face sheets or protrusion of core material. Ensure 'grain' of finish all runs in one direction.

.2 Trim and square edges of sheets with no displacement of face sheets or protrusion of core material.

.1 Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.

.2 Fabricate panels with sharply cut edges, with no displacement of face sheets or protrusion of core material.

.3 Fabricate panels with panel stiffeners, as required to comply with deflection limits, attached to back of panels with structural silicone sealant or bond tape.

.4 Dimensional Tolerances:

.1 Panel Bow: 0.8 percent maximum of panel length or width of 1800 mm panel dimension.

.2 Squareness: 5 mm maximum.

2.5 GENERAL FINISH REQUIREMENTS

.1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

.2 Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

.3 Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Part 3 Execution

3.1 EXAMINATION

.1 Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by cladding support system manufacturer.

.1 Verify that air/vapour barrier has been installed over framing or concrete substrate to prevent air infiltration or water penetration.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION – CLADDING SUPPORT SYSTEM

.1 Erect cladding support system level, plumb at vertical substrates, angled where indicated, and in alignment with building features including corners, off-sets, and fenestrations.

.2 Thermal Spacers and Z-Bars:

.1 Mount thermal spacers in accordance with reviewed shop drawings, and manufacturer’s written recommendations, using self-drilling self-tapping screws at metal stud framed walls.

.2 Tighten fasteners in accordance with fastener manufacturer instructions.

.3 Attach Z-bars to thermal spacers in accordance with manufacturer’s instructions.

.3 Insulation:

.1 Install insulation to completely fill space between spacers and first layer of Z-bars as specified in Section 07 21 13 – Board Insulation.

3.3 INSTALLATION - CMP

.1 General: Install CMP according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.

.1 Shim or otherwise plumb substrates receiving CMP.

.2 Flash and seal CMP at perimeter of openings. Do not begin installation until membrane air barrier and flashings that will be concealed by panels are installed.

.3 Install flashing and trim as CMP work proceeds.

.4 Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing.

.5 Do not apply sealants to joints.

.6 Joint size: indicated.

.2 Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action as recommended by composite metal panel manufacturer, and aluminum flashing manufacturer.

.3 Fasten panels to substrate with concealed clips.

.4 Keep minimum distance to corners and edges as recommended by manufacturer.

.5 Install panels true to line and level with clean cut edges and joints.

.6 Align panels oriented in same direction using arrows on back of panel.

.7 Ensure finished installation is properly secured, free of rattles, distortions, damaged, or chipped components.

3.4 FIELD QUALITY CONTROL

.1 Manufacturer’s Field Technical Service - Cladding Support System: At start of installation, verify installation is in conformance with manufacturer’s instructions and is suitable as cladding support system for CMP.

.1 Confirm fastener sizing and tightening.

.2 Confirm support system members installed in correct orientation.

3.5 ERECTION TOLERANCES

.1 Installation Tolerances: Shim and align CMP units within installed tolerance of 6 mm in 6 m, non-accumulative, on level, plumb, and location lines as indicated and within 3-mm offset of adjoining faces and of alignment of matching profiles.

3.6 CLEAN-UP

.1 Remove temporary protective coverings and strippable films, if any, as CMP are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of CMP installation, clean finished surfaces as recommended by panel manufacturer. Maintain in a clean condition during construction.

.2 After CMP installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

.3 Replace CMP that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Sheathing over deck surface

.2 Vapour retarder

.3 Insulation

.4 Modified bituminous membrane roofing, and flashing

1.2 RELATED REQUIREMENTS

.1 Section 01 21 00 - Cash Allowances, for testing and inspection allowance

.2 Section 07 27 00 - Air/Vapour Barrier, for transition materials at roof/wall junction

.3 Section 07 62 00 - Sheet Metal Flashing and Trim: Weather protection for base flashings

.4 Section 07 72 33 - Roof Hatches: Frame and integral curb

.5 Division 22 - Plumbing: Roof drains

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM C1177/C1177M-13 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing

.2 ASTM C1289-15 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

.2 Canadian General Standards Board (CGSB)

.1 CGSB 37.56M-85 - Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing

.3 Canadian Roofing Contractors' Association (CRCA)

.1 CRCA Roofing Specifications Manual.

.4 Canadian Standards Association (CSA International)

.1 CSA A123.21-10, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems

.5 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S704-11 - Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 19: Project Meetings.

.2 Coordination:

.1 Coordinate with other work having a direct bearing on work of this section.

.2 Coordinate the work with the installation of associated metal flashings, as the work of this section proceeds.

.3 Pre-installation Meetings:

.1 Convene one week before starting work of this section.

.2 Review preparation and installation procedures and coordinating and scheduling required with related work.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Shop Drawings: Indicate setting plan for tapered insulation, layout of seams, direction of laps, base flashing details.

.3 Product Data: Provide product data for membrane, flashing materials, vapour retarders, and insulation.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

.3 Field Reports: Indicate procedures followed, ambient temperatures, wind velocity during application.

1.7 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Closeout submission procedures.

.2 Warranty Certificate.

1.8 QUALITY ASSURANCE

.1 Perform Work to CRCA Roofing Specifications Manual and manufacturer's written instructions. Maintain one copy of documents on site.

.2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

.3 Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by the manufacturer.

.4 Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

.5 Perform Work in accordance with CRCA Roofing Specifications' Manual, and manufacturer's instructions, and to meet required wind uplift resistance requirements.

.6 Roofing Manufacturer: shall perform a technical review of the specified roofing system and details.

1.9 PROTECTION

.1 Fire Extinguishers: maintain minimum one ULC labelled for A, B and C class protection within 6 m of each torch.

.2 At end of each workday, use heat detector gun to spot smouldering or concealed fires. Maintain fire watch for minimum 1 hour after each days roofing operations cease.

.3 Do not apply torch directly to flammable materials.

1.10 DELIVERY, STORAGE, AND HANDLING

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.

.3 Store products in weather protected environment, clear of ground and moisture.

.4 Stand roll materials on end.

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

.6 Place plywood runways over completed Work to enable movement of material and other traffic.

.7 Store sealants at +5 degrees C minimum.

.8 Store insulation protected from daylight, weather, and deleterious materials.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.12 SITE CONDITIONS

.1 Do not install roofing membranes during inclement weather, when temperature remains below minus 18 degrees C for torch application.

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

.3 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 Provide hoarded and heated enclosures for roof work when conditions require.

.4 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

.5 Wherever openings or exposed roof decks cannot be sealed during the work day, provide temporary membrane coverings satisfactory to the Contract Administrator.

1.13 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Provide 10-year system warranty.

.1 Installer’s Warranty: Covers the first two years, dated from time of Substantial Performance.

.1 Installer is responsible for repair of leaks pertaining to faulty materials and workmanship, and repair of installer related roofing defects.

.2 Manufacturer’s guarantee (manufacturer means single company providing modified bituminous membrane roofing): Covers years 3 through 8 of warranty period.

.1 Manufacturer’s written warranty against failure of roofing system, leakage for a period of 10 years from the date of completion of installation. Including labour and material for repair, replacement of roofing components from the structural deck up.

Part 2 Products

2.1 MANUFACTURERS

.1 Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications All roofing components shall be provided from a single manufacturer, unless otherwise noted.

- .1 Soprema
- .2 IKO
- .3 Tremco
- .4 Johns Manville

.2 This Section is based on Products by Soprema. Products from additional manufacturers specified in this Section will be accepted provided they meet requirements of this Specification.

2.2 SYSTEM DESCRIPTION

.1 Two ply modified SBS membrane system, comprised of deck covering, self-adhesive vapour retarder, insulation, cover board, adhesive-bonded base sheet, torched-on granulated surface cap sheet, and related base and cap sheet flashings.

2.3 DESIGN AND PERFORMANCE REQUIREMENTS

.1 Wind Uplift Performance:

- .1 Design roof system for wind uplift performance requirements under direct supervision of a professional engineer experienced in design of this Work and licensed in the Province of Manitoba.
- .2 Prepare roof system assessment report of wind uplift resistance for roofing assembly specified, in accordance with CSA A123.21, or Factory Mutual, and NBC:
  - .1 Building Code Design Parameters:
    - .1 Building Importance: Normal.
    - .2 Building Openings: Category 2.
    - .3 Building Exposure: Rough.
  - .2 For purposes of wind uplift assessment, designate roof membrane as plane of air tightness.
  - .3 Indicate necessary modifications to roofing system assembly to ensure system resistance to wind uplift forces:
    - .1 Address fastener distribution and adhesive application.

.2 General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

.3 Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

.4 Roofing system from one manufacturer, where available, to provide specified warranty.

2.4 DECK COVERING MATERIALS AND FASTENERS

.1 Gypsum Sheathing: ASTM C1177/C1177M, water resistant silicone treated core, glass mat facing, 12.7 mm thick.

.1 Acceptable Products: GP DensDeck; USG Securock Brand Glass-Mat Roof Board.

.2 Plywood: to CSA O121 or CSA O151, Sheathing Grade, 12.7 mm thick, for use at roof perimeter and under parapets, containing no added urea-formaldehyde.

.3 Fasteners: #15 flat counter-sunk head, self-tapping, cadmium plated, length for minimum 19 mm penetration through steel deck.

2.5 PRIMER

.1 For use as vapour retarder primer, parapet/curb primer, and self-adhesive transition primer: Composed of SBS synthetic rubber, adhesive enhancing resins, and volatile solvent used to prime substrates to enhance adhesion of self-adhesive membranes at temperatures above minus 10 degrees C, compatible with vapour retarder, recommended by membrane manufacturer.

.1 Acceptable Product: Soprema Elastocol Stick.

2.6 VAPOUR RETARDER

.1 Self-adhering rubberized asphalt sheet, comprised of SBS modified bitumen adhesive, factory-laminated to woven, high-density slip resistant polyethylene top surface, and release liner on bottom surface. Thickness: 0.76 mm. Moisture vapour permeance: 0.92 ng/Pa·s·m2. Water absorption by weight: less than 0.1 percent.

.1 Acceptable Product: Soprema Sopravap'r.

2.7 ROOF INSULATION, COVER BOARD AND ACCESSORIES

.1 General: Preformed roof insulation boards manufactured or approved by membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

.2 Primary Insulation: Polyisocyanurate board insulation to CAN/ULC S704 or ASTM C 1289, Type II, Class 1, Grade 2, glass-fibre mat facer on both major surfaces, RSI 1.01 per 25 mm thickness. Board size: 1220 by 1220 mm by thickness indicated.

.1 Acceptable Product: Soprema Sopra-Iso Plus.

.3 Cricket, tapered insulation: glass fibre reinforced polyisocyanurate, as specified for accordance with primary insulation, 12.7mm minimum thickness, sloped in accordance with roof plan.

.1 Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain and roof edge. Fabricate to slopes indicated.

.4 Cover Board: Semi-rigid roofing support panel composed of mineral-reinforced asphaltic core between two asphalt-saturated fibreglass liners, 6.4 mm thick.

.5 Bead-Applied Insulation and Cover Board Adhesive: Insulation manufacturer's recommended bead-applied, low-rise, one-component or multicomponent urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

.1 Acceptable Product: Soprema Duotack.

2.8 MEMBRANE MATERIALS

.1 Membrane: to CGSB 37.56, asphalt and polymer modifiers of SBS prefabricated sheet.

.1 Base Sheet Membrane: SBS elastomeric polymer, self-adhesive prefabricated sheet, with glass mat reinforcement, nominal thickness 2.5 mm.

.1 Top surface thermofusible plastic film.

.2 Underside self-adhesive.

.3 Acceptable Product: Soprema Covent Base 830.

.2 Base Sheet Flashing: SBS elastomeric polymer, self-adhesive prefabricated sheet, with composite reinforcement, nominal thickness 3.0 mm.

.1 Top surface: thermofusible plastic film for torch application of cap sheet.

.2 Bottom surface: self-adhesive with plastic release film.

.3 Parapet and curb primer: compatible with flashing, as recommended by membrane manufacturer.

.4 Acceptable Products: Soprema Sopralene Flam Stick.

.3 Cap Sheet Membrane: SBS elastomeric polymer, heavy duty modified bitumen roofing membrane, non-woven polyester reinforcement, coated both sides with styrene butadiene styrene (SBS) modified asphalt, 8 m long x 1 m wide, 4.0 mm thick.

.1 Top surface granule surfaced, colour selected by Contract Administrator.

.2 Underside thermofusible plastic film.

.3 Acceptable Products: Soprema Sopralene Flam 250 GR.

.4 Cap Sheet Flashing: Same as Cap Sheet Membrane

.5 Flame Stop Membrane (self-adhesive): to CGSB 37.56M, Type 2 Class C, Grade 1, SBS modified bitumen membrane, glass fleece reinforced, 1.6 mm thick, 150 mm wide, thermofusible plastic film top, self-adhesive bottom covered by silicone release film.

2.9 FLASHINGS

.1 Flexible Flashings: Same material as membrane.

.2 Counter Flashings: galvanized metal, specified in Section 07 62 00.

.3 Vent Stack Flashing: to CSA B272, vandal proof, 1.6 mm mill finish 1100-0T alloy aluminum, diameter to suit vents, aluminum hood and perforated collar, premoulded urethane insulation liner, bituminous painted deck flange.

.1 Basis of Design: Thaler SJ-31 Vandal Proof Stack Jack Flashing

.4 Rigid Conduit Penetrations: Consisting of mill finish aluminum flashing sleeve with integral deck flange, removable cap, EPDM base seal, and EPDM grommet seal. Diameter to suit conduit size.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that surfaces and site conditions are ready to receive work.

.3 Verify deck is supported and secured.

.4 Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains and eaves.

.5 Verify deck surfaces are dry and free of snow or ice. Verify flutes of metal deck are clean and dry.

.6 Verify roof openings, curbs, pipes, conduit, sleeves, ducts, and vents through roof are solidly set.

3.2 PREPARATION - METAL DECK

.1 Install deck sheathing onto the steel deck to meet wind uplift requirements.

.2 Lay with long side at right angle to flutes; stagger end joints; provide support at ends.

.3 Mechanically fasten sheathing at full roof area of roof deck at upper rib surface.

.4 Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.

3.3 VAPOUR RETARDER APPLICATION

.1 Primer: Apply primer to manufacturer's written instructions for system specified. Allow to dry.

.2 Apply vapour retarder continuously under parapets, curbs and and blocking to provide continuity of air barrier of envelope.

.3 Install self-adhesive vapour barrier on to substrate, overlapping side and end laps to manufacturer's written recommendations.

.4 Begin work at bottom of slopes, unroll and align on substrate. Ensure all edges are supported.

.5 Remove release sheet and adhere membrane, working in sections to avoid wrinkles in membrane.

.6 Lap and seal vapour retarder onto galvanized sheet metal transition at roof/wall junction, to other vapour retarder materials provided in other Sections. Minimum 150 mm laps.

3.4 INSULATION APPLICATION

.1 Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.

.2 Comply with roofing system manufacturer's written instructions for installing roof insulation with adhesive.

.3 Install tapered insulation under area of roofing to conform to slopes indicated.

.4 Install insulation under area of roofing to achieve required thickness. Install two or more layers with joints of each succeeding layer staggered from joints of previous layer minimum 150 mm in each direction.

.5 Trim surface of insulation where necessary at roof drains so completed surface is dished and does not restrict flow of water.

.6 Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps larger than 6 mm with insulation.

.1 Cut and fit insulation within 6 mm of nailers, projections, and penetrations.

.7 Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

.1 Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

.8 Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below minimum 150 mm in each direction. Butt cover boards together. Tape joints if required by roofing system manufacturer.

.1 Adhere cover board onto insulation using adhesive, firmly pressing and maintaining cover board in place. Provide supplementary fasteners if required to resist uplift pressure at corners and perimeter of roof.

3.5 MEMBRANE APPLICATION

.1 Apply membrane and primer to manufacturer's written instructions, and as follows.

.2 General:

.1 Extend membrane up parapets and curbs minimum 200 mm above roofing membrane. Cap, permanently seal, and apply flashing to top of upstands.

.2 Install waterproof cut-off to membrane at end of day's operation. Remove cut-off before resuming roofing.

.3 Install roofing membrane sheets so side and end laps shed water.

.4 Seal membrane around roof penetrations and protrusions.

.5 Unroll roofing membrane sheets and allow to relax for minimum time period required by manufacturer.

.3 Self-Adhesive Base Sheet:

.1 Align base sheet beginning at low point of roof and align membrane along centre line of roof drain. Dry install base sheet in parallel strips without stretching. Extend sheets up parapets and other vertical surfaces.

.2 Remove release sheet and adhere membrane, working in sections to avoid wrinkles in membrane.

.3 Lap sheets 75 mm minimum for side, and 150 mm minimum for end laps. Stagger end joints minimum 300 mm.

.4 Cut off corners at end laps at areas to be covered by next roll.

.5 Carry up minimum 100 mm on vertical surfaces.

.6 Application: free of blisters, wrinkles and fishmouths.

.4 Base Sheet Flashing:

.1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.

.2 Prime curbs and parapets before applying self-adhesive base sheet flashing.

.3 Remove plastic film from area of base sheet that will be covered by flashing.

.4 Precut membrane flashing. Adhere base sheet flashing sheet onto substrate in one metre wide strips.

.5 Cut off corners at end laps at areas to be covered by next roll.

.6 Remove 150 mm of release film and set flashing in place. Extend membrane over weather barrier membrane of wall construction and seal.

.7 Remove release film and press flashing down in accordance with manufacturer’s instructions.

.8 Lap base sheet flashing onto membrane base sheet. Extend base sheet flashing minimum 100 mm beyond perimeter fasteners or minimum 150 mm, whichever is further, and seal.

.9 Overlap side laps minimum 75 mm. Seal joints.

.10 Stagger joints in flashing and joints in roof membrane minimum 100 mm to avoid excessive layering.

.11 Provide reinforcing gusset at inside and outside corners.

.12 Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

.13 Secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

.5 Torch-on Cap Sheet:

.1 Starting at low point on roof, perpendicular to slope, unroll double-selvedge starter roll cap sheet, align and reroll from both ends.

.2 Unroll and torch cap sheet onto base sheet. Do not burn membrane or its reinforcement.

.3 At end and head laps of cap sheets, where T joint occurs, cut corner of membrane to be overlapped, on a 45 degree angle.

.4 Degranulate overlap surfaces.

.5 Lap sheets along factory-provided lines for sides, and 150 mm for end laps. Stagger end laps minimum 300 mm.

.6 Offset joints in cap sheet 300 mm from joints in base sheet.

.7 Heat-weld cap sheet membrane to create bleed out of 3 to 6 mm.

.8 Terminate cap sheet at roof perimeter.

.9 Application to be free of blisters, fishmouths and wrinkles.

.10 Avoid walking over finished surfaces. Use rigid protective walkways.

.6 Torch-on Cap Sheet Flashing:

.1 Apply cap sheet flashing onto substrate in one metre wide strips.

.2 Lap flashing along factory-provided lines for sides. Lap cap sheet flashing to membrane cap sheet minimum 150 mm. Offset joints in cap sheet flashing minimum 100 mm from joints in cap sheet.

.3 Use chalk line to draw straight line on field surface, 150 mm from flashings and parapets.

.4 Embed surface granules in layer of hot bitumen, starting from chalk line on field surface to bottom edge of flashing or parapet, and on granulated vertical surfaces to be overlapped.

.5 Heat weld cap sheet flashing starting from bottom of flashing.

.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

3.6 FLASHINGS AND ACCESSORIES

.1 Roof penetrations: Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with manufacturer's recommendations and details.

.1 Roof drains:

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

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

.3 Embed membrane flashings into heavy coatings of adhesive, sealant, extend plies onto roof beyond outer edge of flange in accordance with manufacturer’s instructions.

.2 Mechanical and Electrical Penetration Flashing: Extend minimum 300 mm above roof membrane.

3.7 CAULKING TO ROOF WORK

.1 Provide caulking, sealing to roofing, and sheet metal work required. Provide waterproof, weathertight roofing system.

3.8 FIELD QUALITY CONTROL

.1 Section 01 45 00: Field inspection.

.2 Inspections:

.1 Independent inspection of roofing application will be carried out by independent inspection and testing agency appointed by Contractor, and acceptable to Contract Administrator.

.2 Costs for inspections will be paid for by cash allowance as specified in Section 01 21 00 – Cash Allowances.

.3 Independent inspection and testing agency has authority to initiate minor 'no cost' changes to details, to suit job site conditions.

.4 Responsibilities of Independent Examination and Testing Agency:

.1 Review all aspects of roofing work, metal flashings, deck, blocking.

.2 Examine roof in accordance with inspection procedures outlined by CRCA, including following:

.1 Preliminary roof deck examination to ensure deck surfaces are in proper condition to receiving roofing. Notify Contractor of deleterious conditions not corrected.

.2 Review of roofing specification. Notify Contract Administrator of variances or discrepancies between good roofing practices from those specified.

.3 Examination of roofing materials on site. Notify Contract Administrator of variances from specified materials.

.4 Examination of workmanship, installation of roofing materials, minimum one trip per day during any roofing operation, made early each working day.

.3 Take photographs of roofing work in process, condition of roof surfaces. Submit photographs with written reports. Indicate vantage point, date taken, peculiarities or comments on photographs.

.4 Submit daily written reports, including but not limited to, procedures followed, ambient temperatures and wind velocity during application.

.5 Submit final report, typewritten, within one week of final examination of any completed roof area, based on examination trips, results of examinations, in accordance with outlined procedures for roof examinations.

.5 Correct identified defects or irregularities.

3.9 CLEANING

.1 Section 01 74 00: Cleaning installed work.

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

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

3.10 PROTECTION OF FINISHED WORK

.1 Remove bituminous markings from finished surfaces.

.2 Protect building surfaces against damage from roofing work.

.3 Where traffic must continue over finished roof membrane, protect surfaces.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Formed low-slope roof sheet metal fabrications.

.2 Formed metal trim.

1.2 RELATED REQUIREMENTS

.1 Section 07 42 43 – Composite Wall Panels: prefinished closure profiles at metal cladding

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B209M-14 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type

.3 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

.1 SMACNA 1120-2012 - Architectural Sheet Metal Manual, 7th Edition

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Shop Drawings:

.1 Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

.2 Indicate materials and methods used to isolate and protect incompatible materials.

.3 Samples: Submit duplicate 50 by 50 mm samples of each type of sheet metal material, colour and finish.

1.5 QUALITY ASSURANCE

.1 Perform Work to SMACNA 1120 standard details and requirements.

1.6 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

.3 Prevent contact with materials which may cause discolouration or staining.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak or loosen, and shall remain watertight, and provided finished appearance.

2.2 SHEET MATERIALS

.1 Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A755M.

.1 Zinc-Coated (Galvanized) Steel Sheet: ASTM A653M, Z275 coating designation; structural quality.

.2 Surface: smooth.

.3 Exposed coil-coated finish: Silicone-modified polyester comprised of epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.005 mm for primer and 0.02 mm for topcoat. Colour selected by Contract Administrator.

.2 Galvanized Steel: to ASTM A653/A653M, Z275 zinc coating designation; minimum 0.61 core steel thickness.

.3 Aluminum Sheet: to ASTM B209M, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.

.1 Exposed Coil-Coated Finish: Three-coat fluoropolymer finish to AAMA 620, containing not less than 70 percent Kynar 500 or Hylar 5000 PVDF resin by weight in both colour coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. Allow for one colour selected by Contract Administrator to match adjacent CMP panels.

2.3 ACCESSORIES

.1 General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal unless otherwise indicated.

.2 Isolation coating: alkali resistant bituminous paint.

.3 Plastic cement: to CAN/CGSB 37.5.

.4 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32.

.5 Sealants: as specified in Section 07 92 00 - Joint Sealants.

.6 Cleats: of same material, and temper as sheet metal, continuous. Thickness same as sheet metal being secured.

.7 Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

.1 General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

.1 Exposed Fasteners: Heads matching colour of sheet metal using plastic caps or factory-applied coating.

.2 Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

.2 Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

.3 Fasteners for Metallic-Coated Steel Sheet, and Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel

.8 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.9 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 FABRICATION

.1 General: Custom fabricate sheet metal flashing and trim to comply with recommendations SMACNA's Architectural Sheet Metal Manual that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

.1 Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

.2 Obtain field measurements for accurate fit before shop fabrication.

.3 Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

.4 Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

.2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints. Underflash at joints, with closed turned up ends.

.3 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.

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

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

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, and nailing strips located.

.3 Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

.1 Install starter and edge strips, and cleats before starting installation.

3.3 INSTALLATION

.1 Install sheet metal work in accordance with CRCA FL series details, and as detailed.

.1 Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

.2 Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

.3 Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

.4 Do not torch cut sheet metal flashing and trim.

.5 Do not use graphite pencils to mark metal surfaces.

.2 Use concealed fastenings except where approved before installation.

.3 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips.

.4 Lock end joints and caulk with sealant.

.5 Metal protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA Architectural Sheet Metal Manual.

.1 Coat back side of uncoated aluminum sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

.2 Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet. Secure in place and lap joints 100 mm.

.6 Insert metal flashing under cap flashing to form weathertight junction.

.7 Caulk flashing at cap flashing with sealant.

.8 Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 3 m with no joints allowed within of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 25 mm deep, filled with sealant concealed within joints.

.9 Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA Architectural Sheet Metal Manual, and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 75-mm centres.

.10 Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA Architectural Sheet Metal Manual, and as indicated.

.1 Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 400-mm centres.

.2 Anchor interior leg of coping with washers and screw fasteners through slotted holes at 600-mm centres.

3.4 CLEANING AND PROTECTION

.1 Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

.2 Clean and neutralize flux materials.

.3 Clean off excess sealants.

.4 Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

.5 Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touch-up or similar minor repair procedures.

3.5 SCHEDULES

.1 Metallic-Coated Steel Sheet Flashing and Trim: Form exposed flashings, cap flashings, trim, copings and fascia to profiles indicated of prefinished steel sheet,

.1 Within 1200 mm of floor or grade: Minimum 1.02 mm, base metal thickness.

.2 Other locations: Minimum 0.76 mm, base metal thickness.

.2 Aluminum Flashing and Trim: Form exposed flashing to profiles indicated of prefinished aluminum sheet.

.1 At parapets, and within 1200 mm of floor or grade: Minimum 3 mm thick, base metal thickness.

.2 Other locations: Minimum 0.81 mm thick, base metal thickness.

.3 Galvanized Flashing and Trim:

.1 Concealed Flashing: Form to profiles indicated of minimum 0.61 mm thick galvanized sheet steel.

.2 Drip Edge: Fabricate continuous sections from minimum 0.61 mm thick galvanized sheet steel for under copings, and where indicated. Fabricate discontinuous sill, and similar flashings to extend 150 mm beyond each side of wall openings. Form with 50-mm- high, end dams where flashing is discontinuous.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Prefabricated roof hatches with integral support curbs, operable hardware, and counterflashings.

1.2 RELATED REQUIREMENTS

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

.2 Section 07 62 00 - Sheet Metal Flashing and Trim: Flashing to roof system.

.3 Section 09 91 10 - Painting: Field painting.

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC S704-11, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: for each specified product.

.3 Shop Drawings: Indicate size and description of components, materials, attachment devices, description of frame and finish, and construction details.

1.5 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Installation Data: Manufacturer's special installation requirements, including special installation criteria, interface with adjacent components.

1.6 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for hardware complete with pertinent details, spare parts lists and warnings against harmful maintenance materials and practices for incorporation into manual specified in 01 78 10 - Closeout Submittals.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 PERFORMANCE AND DESIGN REQUIREMENTS

.1 General Performance: Roof hatch shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction

.2 Design Requirements:

.1 Structural Performance: Withstand snow load of 1.90 kPa, wind uplift of 1.0 kPa.

.2 Thermal Performance:

.1 Withstand temperature range of 90 degrees C without damage to unit or permanent deformation to seals.

.2 Minimum RSI 2.1 for cover and curb insulation.

2.2 MANUFACTURERS

.1 Manufacturers/Products: Roof Hatch

.1 Bilco; S-50TB.

.2 Lexcor; R-100G-R20

.3 Nystrom; Personnel Hatch with optional 50 mm polyisocyanurate insulation.

.2 Manufacturer/ Products: Safety Post

.1 Bilco; LadderUP LU-4.

.2 Nystrom; SPA

2.3 MATERIALS

.1 Galvanized steel sheet: commercial quality to ASTM A653/A653M, Z275 designation zinc coating

.2 Insulation: polyisocyanurate, to CAN/ULC-S704; minimum 50 mm thick.

.3 Gaskets: extruded resilient neoprene rubber, with full recovery after 50% compression.

.4 Fasteners: corrosion-resistant mechanical fasteners suitable for roof requirements.

.5 Isolation coating: alkali resistant bituminous paint.

2.4 ROOF HATCH

.1 Cover: single-leaf, preformed minimum 1.99 mm thick galvanized steel outside sheet, 0.85 mm minimum thick steel liner, insulated sandwich construction, minimum 50 mm thick polyisocyanurate insulation; complete with flange, and continuous rubber gasket to provide weatherproof seal. Exterior finish: prime painted.

.2 Integral Steel Curb: 300 mm high by 1.99 mm minimum thick galvanized steel with flanges prepared for mounting, complete with integral cap flashing, and minimum 50 mm rigid polyisocyanurate insulation.

.3 Hardware: Heavy-duty pintle hinges with stainless steel hinge pins, compression spring operator, hold-open arm, snap latch with turn handle, padlock hasps and neoprene draft seal.

.4 Size: Indicated.

.5 Hardware: Cadmium plated finish:

.1 Compression spring operator.

.2 Steel manual pull handle for interior operation.

.3 Steel hold open arm with vinyl covered grip handle for easy release.

.4 Hinges: Manufacturer's recommended type.

2.5 SAFETY POST

.1 Telescopic safety post constructed of mill finish aluminum, for mounting to top two rungs of access ladder. Automatic locking in fully extended position. Complete with fasteners for securing to access ladder rungs.

2.6 FABRICATION

.1 Fabricate components free of visual distortion or defects. Weld corners and joints.

.2 Provide for removal of condensation occurring within components or assembly.

.3 Fit components for weather tight assembly.

.4 Design flashings to collect and lead off accumulated condensation.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify dimensions, tolerances, and method of attachment with other work.

.3 Verify openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 INSTALLATION

.1 Install roof hatch to manufacturer's written instructions.

.2 Coordinate with installation of roofing system and related flashings for weather tight installation.

.3 Apply bituminous paint on surfaces of units in contact with cementitious materials or dissimilar metals.

.4 Adjust and seal assembly with provision for expansion and contraction of components.

.5 Secure prefabricated curb assembly to structure. Install wood blocking under preformed metal curbs to achieve a minimum height of 200 mm from top of roof membrane to top of curb frame.

.6 Coordinate and install exterior flashing. Secure and seal frame to curb. Seal with sealant as specified in Section 07 92 00 – Joint Sealants.

.7 Adjust hardware and roof access hatch for smooth operation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Tested and listed firestopping systems.

1.2 RELATED REQUIREMENTS

.1 Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC): Mechanical work requiring firestopping

.2 Division 26 – Electrical: Electrical work requiring firestopping.

1.3 DEFINITIONS

.1 Fire Stop: a system consisting of a material, component, and means of support used to fill gaps between fire separations or between fire separations and other assemblies, or used around items that wholly or partially penetrate a fire separation.

.2 Fire Separation: a construction assembly that acts as a barrier against the spread of fire.

.3 Single Component Fire Stop System: fire stop material that has Listed Systems Design, and is used individually without use of high temperature insulation or other materials to create fire stop system.

.4 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Designs to create on site fire stop system.

.5 Non-Rated Fire Separation: A separation that prevents passage of fire and smoke for a time period that allows fire suppression system to be activated and contain the fire.

.1 Non-rated fire separations indicated on Drawings are assigned minimum 45-minute fire resistance rating. Firestop on both sides of separation.

.6 Tightly Fitted: penetrating items that are cast in place in building of non-combustible construction or have zero annular space in buildings of combustible construction.

1.4 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM E814-13a - Standard Test Method for Fire Tests of Penetration Firestop Systems

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S115-11 - Standard Method of Fire Tests of Firestop System

.3 Firestop Contractors International Association (FCIA)

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: for each type of product specified. Indicate:

.1 Technical data on out-gassing, off-gassing and age testing.

.2 Curing time.

.3 Chemical compatibility to other construction materials.

.3 Submit system design listings including illustrations from a qualified nationally recognized testing and inspection agency applicable to each firestop configuration. Indicate proposed materials, reinforcement, anchorage, fastenings, and method of installation reflecting actual project conditions.

.1 Unlisted Firestopping Systems: Obtain an Engineering Judgment (EJ) or Equivalent Fire Resistance Rated Assembly (EFRRA) from firestop manufacturer where no specific third party tested, listed and classified firestop system is available for a particular firestop configuration.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Installation Data: Manufacturer's written special preparation and installation requirements and tested and listed firestop systems designs.

.3 Installer Qualifications: when requested by Contract Administrator.

.4 Statement of Compatibility. Stating firestopping materials and substrates are compatible.

.5 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

.6 Manufacturer's Field Reports: Written reports within 3 days of review, verifying compliance of Work, as described in Part 3, Article “Field Quality Control”.

1.7 CLOSEOUT SUBMITTALS

.1 Incorporate the following into Operation and Maintenance Manual:

.1 MSDS.

.2 Product literature for each product used.

.3 For each fire stop system indicate: Room number/name, location within room, rating, EJ, product description, maintenance requirements, and life expectancy of each product installed.

.4 List date of installation for each product and month/year of expected expiration of each product.

1.8 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years experience and FCIA Manufacturer Member in good standing.

.2 Installer Qualifications: Company specializing in performing the work of this section and is an FCIA member in good standing.

.3 Single Source Responsibility: Obtain firestop systems for each type of penetration and construction situation from a single primary firestop systems manufacturer. Obtain firestop systems for complete project, from a single primary firestop systems manufacturer, to the greatest extent possible.

.4 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.

.2 Twice during progress of Work at 25% and 60% complete.

.3 Upon completion of Work, after cleaning is carried out.

1.9 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Deliver firestopping products in original, unopened containers with labels intact and legible, identifying product and manufacturer.

.3 Store and handle firestopping materials to manufacturer's instructions.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.11 SITE CONDITIONS

.1 Ambient Conditions:

.1 Do not apply materials when temperature of substrate material and ambient air is below manufacturer’s recommended application temperature.

.2 Maintain this minimum temperature before, during, and for three days after installation of materials.

.3 Provide ventilation to manufacturer's instructions in areas to receive solvent cured materials.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers:

.1 A/D Fire Protection Systems

.2 3M Fire Protection Products.

.3 Hilti, Inc.

.4 Specified Technologies, Inc.

.5 Tremco.

2.2 SYSTEM DESCRIPTION

.1 Tested and listed firestopping systems consisting of a material or materials, the wall or floor assembly, and penetrating items or gaps, assembled or placed in spaces, gaps, joints and building perimeters, to restore the fire resistance rating and or smoke resistant properties of a fire resistance rated assembly or smoke resistant assembly.

2.3 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire resistance ratings and surface burning characteristics.

.2 Provide certificate of compliance from authority having jurisdiction indicating approval of materials, tested and listed systems or engineering judgments used.

2.4 PERFORMANCE REQUIREMENTS

.1 Penetrations: Firestopping systems produced to resist spread of fire and passage of smoke and gases according to specified requirements, including but not limited to:

.1 Firestop penetrations passing through fire resistance rated wall and floor assemblies, and other locations indicated.

.2 Complete penetration firestopping systems tested and approved by third party testing.

.2 Obtain an Engineering Judgment (EJ) or Equivalent Fire Resistance Rated Assembly (EFRRA) submittal from firestop manufacturer where no specific third party tested, listed and classified firestop system is available for a particular firestop configuration.

2.5 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against passage of flame, smoke, water and toxic gases in compliance with requirements of CAN/ULC-S115 or ASTM E814, and not to exceed opening sizes for which they are intended, in accordance with ULC or cUL Design Numbers or other design system listing acceptable to authority having jurisdiction.

.2 Firestopping materials and systems: Flexible to allow for movement of building structure and penetrating items without affecting adhesion or integrity of system.

.2 Firestop products may include, but not be limited to:

.1 Sealants, sprays, mortars, fire straps and breaks.

.2 Fire barrier mouldable putties, with or without backing.

.3 Fire barrier self-locking pillows containing intumescent composition.

.4 Fire barrier composite sheets used to cover large or blank openings.

.5 Firestop devices: factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

.3 Firestopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.4 Firestopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: firestop collars or wrap devices; elastomeric seal.

.5 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.6 Sealants for vertical joints: non-sagging.

.7 Fire-rated acoustical sealant: rated for use in fire-resistance rated partitions requiring sound transmission control.

2.6 ACCESSORIES

.1 Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.

.2 Forming/Packing Material: Permanent type, suitable for application.

.3 Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

.4 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping are ready to receive the work of this section.

.3 Verify tested and listed systems selected are applicable to the conditions encountered.

.4 Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Clean substrate surfaces as recommended in manufacturer's written instructions, of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material and performance of firestop system for fire or smoke resistant situations.

.2 Remove incompatible materials which may affect bond.

.3 Install damming or backing materials to arrest liquid material leakage.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 APPLICATION

.1 Install firestopping at walls or partition openings that contain penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping to tested and listed system or engineering judgment.

.2 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.

.3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.5 Tool or trowel exposed surfaces to neat finish.

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

3.4 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Clean adjacent surfaces of firestopping materials.

3.5 PROTECTION OF FINISHED WORK

.1 Section 01 78 40: Protecting installed work.

.2 Protect adjacent surfaces from damage by material installation.

3.6 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in Article “Submittals for Information”.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in Article “Quality Assurance”.

3.7 SCHEDULES

.1 Firestop and smoke seal at, but not limited to, the following locations:

.1 Penetrations through fire-resistance-rated floor and roof assemblies requiring protected openings including both empty openings and openings that contain penetrations.

.2 Penetrations through fire-resistance-rated wall assemblies including both empty openings and openings that contain penetrations.

.3 Membrane penetrations in fire-resistance-rated wall assemblies where items penetrate one side of the barrier.

.4 Top of fire-resistance rated gypsum board partitions.

.5 Joints in fire-resistance-rated assemblies to allow independent movement.

.6 Perimeter of horizontal fire resistance rated assembly and exterior wall between a rated floor/roof and an exterior wall assembly.

.7 Around mechanical and electrical assemblies penetrating fire separations.

.8 Joints, through penetrations and membrane penetrations in assemblies such as smoke barriers, smoke partitions and those assemblies required to limit, restrict or retard the passage of smoke.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Sealants and joint backing.

1.2 RELATED REQUIREMENTS

.1 Section 07 27 00 - Air Barriers: Sealants required in conjunction with air barrier.

.2 Section 07 84 00 - Firestopping: Sealants required in conjunction with firestopping.

.3 Section 08 80 50 - Glass and Glazing: Sealants required in conjunction with glazing methods.

1.3 REFERENCES

.1 ASTM International (ASTM)

- .1 ASTM C834-10 - Standard Specification for Latex Sealants
- .2 ASTM C919-12 - Standard Practice for Use of Sealants in Acoustical Applications
- .3 ASTM C920-14 - Standard Specification for Elastomeric Joint Sealants
- .4 ASTM C1193-13 - Standard Guide for Use of Joint Sealants

.2 ECD Energy & Environment Canada

- .1 Green Globes Canada, Design for New Construction and Major Retrofits v.2 2014

.3 South Coast Air Quality Management District (SCAQMD)

- .1 SCAQMD Rule 1168, Adhesives and Sealants Applications Amended January 7, 2005; Rules in affect July 1 2005

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 19: Project Meetings.

.2 Coordination:

- .1 Coordinate with other work having a direct bearing on work of this section.
- .2 Coordinate the work with all sections referencing this section.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: for products indicated.

.3 Samples:

- .1 Submit duplicate colour samples of each type of material and colour.
- .2 Where custom colours are requested, submit colour samples of actual product for review by Contract Administrator.

1.6 QUALITY ASSURANCE

.1 Products of This Section: Shall have Environmental Product Declaration (EPD) certification.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 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.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.9 AMBIENT CONDITIONS

.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 degrees C.

.2 When joint substrates are wet.

.3 Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

.4 Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

.2 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.

.3 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 SUSTAINABILITY REQUIREMENTS

.1 Comply with prescribed limits of VOCs per South Coast Air Quality Management District Rule 1168 for volatile organic compounds, or have third-party certifications showing compliance to predetermined indoor air quality standards in accordance with Green Globes Canada, Design for New Construction and Major Retrofits, and Section 01 35 63 - Sustainability Certification Project Requirements.

.1 VOC Content: Maximum 250 g/L (less water) to SCAQMD Rule 1168.

2.2 SEALANTS

.1 General:

.1 Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

.2 Do not use sealants that emit strong odours, contain toxic chemicals or are not certified as mould resistant in air handling units.

.3 When low-emitting sealants are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.4 Where sealants are qualified with primers use only those primers.

.2 Neutral cure, one part, low modulus silicone, movement range to ±50%, for exterior and interior use on concrete, metals, glass, porcelain, control joints, expansion joints; to ASTM C920, Type S, Grade NS, Class 50, colour selected by Contract Administrator.

.1 Acceptable products: GE SCS2000 Silpruf, Dow Corning 790, Tremco Spectrum 2.

.3 One component, polyurethane, for interior, exterior use in aluminum, window frame joints, and air seals; to ASTM C920, Type S, Grade NS, Class 25, colour selected by Contract Administrator.

.1 Acceptable products: Tremco Vulkem 116, Sika Canada Sikaflex 1-a, Tremco Dymonic.

.4 Multi-component, polyurethane, for finished, interior, exterior areas in control joints, concrete, precast concrete, tile, floors, and walks to ASTM C920, Type S, Grade NS, Class 25, colour selected by Contract Administrator.

.1 Acceptable products: Sika Canada Sikaflex 2c, Tremco Dymeric 240.

.5 Mildew-resistant, to ASTM C920, Type S, Grade NS, Class 25, one part, high modulus silicone, movement range ±25%, for interior use in wet areas around mop sink bases, and lavatories, toilets, and other plumbing fixtures. Colour selected by Contract Administrator.

.1 Acceptable products: Dow Corning 786, Tremco Tremsil 200, GE Sanitary SCS1700, Franklin International Titebond Kitchen and Bath Sealant.

.6 Mildew-resistant, paintable silicone, to ASTM C920, Type S, Grade NS, Class 25, one part, high modulus silicone, movement range ±25%, for interior use around countertops, other counter surfaces adjacent to painted surfaces.

.1 Basis of Design: GE Groov Kitchen/Bath/Plumbing.

.7 Acrylics One Part: general purpose, one part, paintable translucent acrylic, movement range ±10%, for interior use in dry areas around windows, door frames, interior caulking to gypsum board, masonry, and metals; to ASTM C834.

.1 Acceptable products: Tremco Mono 555, Franklin International Titebond Painters Plus Caulk, GE RCS20 Siliconized Acrylic Sealant.

.8 Acoustical Sealant, for use at perimeter joints in sound rated gypsum board partitions, and masonry partitions:

.1 For exposed and joints: non-sag, paintable, non-staining latex sealant complying with ASTM C834.

.1 Acceptable products: GE RCS20 Siliconized Acrylic Sealant.

.2 For concealed joints: to CAN/CGSB-19.21, non-drying, non-hardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

.1 Acceptable products: Tremco Acoustical Sealant.

2.3 ACCESSORIES

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

.2 Primer: as recommended by manufacturer.

.1 Maximum VOC Content: 200g/L, less water.

.3 Back-up Materials:

.1 Backer rod: polyethylene, closed cell foam backer rod, compatible with sealant, recommended by manufacturer, diameter oversize 30 to 50% to suit joint.

.1 Acceptable products: Dow Chemical Ethafoam, Tremco Sof Rod.

.2 Bond breaker tape: polyethylene, pressure sensitive bond breaker tape which will not bond to sealant.

.4 Masking tape: Non-staining, non-absorbent type compatible with sealant and adjacent surfaces.

.5 Preformed Foam Joint Sealant: Manufacturer's standard preformed, pre-compressed, open-cell foam sealant manufactured from urethane foam with minimum density of 160 kg/m^3 and impregnated with non-drying, water-repellent agent. Factory produce in pre-compressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.

.1 Acceptable products: Emseal Joint Systems Ltd. Backerseal.

Part 3 Execution

3.1 EXAMINATION

.1 Examine joints indicated to receive joint sealants, with installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

.2 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.

.3 Ensure joint surfaces are dry and frost free.

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

.5 Test materials being sealed, caulked for staining, adhesion.

.6 Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal

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

3.3 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.

3.4 MIXING

.1 For multi-component sealants, mix materials in strict accordance with sealant manufacturer's instructions.

3.5 INSTALLATION

.1 Perform installation in accordance with ASTM C1193 for solvent release and latex base sealants, and ASTM C919 for acoustical sealants.

.2 Install sealant to manufacturer's written instructions.

.3 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

.4 Apply sealant in continuous beads, using gun with proper size nozzle.

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

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

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

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

.9 Apply non-paintable silicone sealants after wall surfaces have been painted.

.10 Curing:

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

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

3.6 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Clean adjacent soiled surfaces.

.3 Remove masking tape and excess sealant.

.4 Protect sealants until cured.

END OF SECTION