

**Part 1 General**

**1.1 REFERENCES**

- .1 All References are to be the latest edition or latest edition adopted by the authorities having jurisdiction including all adopted addendums,
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM C1311-14, Standard Specification for Solvent Release Sealants.

**1.2 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Product Data: Submit product data for damproofing waterproofing membranes, drainage board and protection board.
- .3 Samples: Submit 300 mm x 300 mm piece of each type of membrane, drainage board drain tile and protection board.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle materials in accordance with contract requirements and in accordance with manufacturer's written instructions.

**Part 2 Products**

**2.1 MATERIAL**

- .1 Liquid Bituminous Dampproofing: emulsified asphalt coating, for application without primer, selected for temperature conditions at time of application.
- .2 Sealing compound: Plastic cutback asphalt cement.

**2.2 ACCESSORIES**

- .1 Sealant: Butyl joint sealant to ASTM C1311-14; or other sealant compatible with damproofing and approved by damproofing manufacturer.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Notify Departmental representative of any deficiencies in the substrate that may affect application.
- .2 Before applying damproofing:
  - .1 Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through damproofing with sealing compound.

### **3.2 APPLICATION**

- .1 Apply continuous, uniform coating to entire exterior faces of foundation walls from 50 mm below finished grade level to and including tops of foundation wall footings.
- .2 Apply two additional coats of damproofing to vertical corners and construction joints for a minimum width of 250 mm on each side, and all around and for 250 mm along pipes passing through walls.

### **3.3 BACKFILL**

- .1 Arrange for review by then departmental representative prior to back-filling

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 06 10 11 - Rough Carpentry
- .2 Section 07 26 00 – Vapour Retarder
- .3 Section 07 27 10 – Modified Bituminous Sheet Air Barrier
- .4 Section 07 46 23 - Wood Siding
- .5 Section 07 52 00 - Modified Bituminous Roofing Membrane
- .6 Section 08: - Foam fill at doors and windows
- .7 Section 09 21 16 - Gypsum Board Assemblies

**1.2 REFERENCES**

- .1 All References are to be the latest edition or latest edition adopted by the authorities having jurisdiction including all adopted addendums,
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C612-04, Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
  - .2 ASTM C1320-99, Standard Practice for Installation of Mineral Fibre Batt and Blanket Thermal Insulation for Light Weight Frame Construction.
  - .3 ASTM E557, Standard Practice for Architectural Application and Insulation of Operable Partitions.
- .3 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
  - .2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704-03, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
  - .4 CAN/ULC-S710.1-05, Standard for Thermal Insulation –Bead – Applied One Component Polyurethane Air Sealant Foam, Part1 and Part 2

**1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Provide samples of all products and accessories.

#### **1.4 MOCK-UP**

- .1 Construct mock-ups 3 m wide by 3 m high, in the locations as directed by the Departmental Representative.
- .2 Non approved mock-ups will be corrected or replaced at the discretion of the Departmental Representative at no extra cost.
- .3 Approved mock-up may remain as part of the Work.
- .4 Re-do mock-up as many times as required until accepted.
- .5 Accepted mock-ups may remain as part of the Work.
- .6 General Contractor to coordinate review time 2 weeks prior.
- .7 Mock-up installation / review to be conducted after the scheduled bi-weekly Project meeting.
- .8 Review and acceptance of mock-up by the Departmental Representative is required before proceeding with any work.
- .9 Work installed prior to review is subject to removal.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with contract requirements and in accordance with manufacturer's written instructions.

### **Part 2 Products**

#### **2.1 RIGID INSULATION**

- .1 Extruded polystyrene (XPS): to CAN/ULC-S701.
  - .1 Type: Type IV
  - .2 Compressive strength: 210 kPa (30 psi)
  - .3 Thickness: 100 mm; to match existing
  - .4 Installation: Multi layers; Maximum 50 mm per layer
  - .5 Edges: ship lapped.

#### **2.2 DECK INSULATION / SHEATHING – METAL ROOF**

- .1 Polyisocyanurate Insulation: To CAN/ULC-S704-01, Facing to be 18 mm thick factory applied oriented strand board (OBS), CFC free.
  - .1 R-Value: All insulation will be based on R-5/inch: R-30.
  - .2 Edges: ship lapped.
  - .3 Density: 40 kg / m<sup>3</sup>
  - .4 Shape: flat.
    - 1. Use multiple layers to achieve desired thickness. Minimum 2 layers.
      - .1 90mm maximum thickness per layer
      - .2 Top layer only to have OBS facing.
    - 2. Boards are to be a maximum of 1220 mm width x 1220 mm length.

## **2.3 SEMI-RIGID WALL INSULATION**

- .1 Resin-Bonded Rock Wool to ASTM C612,
  - .1 Type: Type 4B
  - .2 Thickness: as indicated.
  - .3 Density: Minimum 70 Kg.m3 and 96 Kg/m3. Provide higher as required by the manufacturer or installer.
  - .4 Installation: Multi layers; Maximum 100 mm per layer
  - .5 Edges: ship lapped.

## **2.4 BATT INSULATION**

- .1 Glass Fibre Batt: to CAN/ULC-S702
  - .1 Type: 1.
  - .2 Surfaces: un-surfaced
  - .3 Thickness: as indicated.
  - .4 Installation: Multi layers; Maximum 100 mm per layer

## **2.5 SOUND BATT INSULATION**

- .1 Glass Fibre Batt: to CAN/ULC-S702
  - .1 Type: 1.
  - .2 Surfaces: un-surfaced
  - .3 Thickness: 65 mm or as indicated.

## **2.6 FOAM INSULATION**

- .1 Expanding Foam: to CAN/ULC-S710.1 single component, low-expanding polyurethane foam. Compatible with rigid insulation.

## **2.7 ADHESIVE**

- .1 Adhesive: VOC compliant polyurethane construction adhesive, resistant to freezing; VOC limit 70 g/l when tested in accordance with USEPA Method 24 and ASTM D23569.

## **2.8 ACCESSORIES**

- .1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self-locking type.
- .2 Insulation clips for non-adhesive friendly substrate: steel, concrete screw with 25 mm diameter washer, length to suit insulation.

## **Part 3 Execution**

### **3.1 WORKMANSHIP**

- .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 insulation minimum 75mm from heat emitting devices such as recessed light fixtures.
- .5 Cut and trim insulation neatly to fit spaces.
  - .1 Butt joints tightly, offset vertical joints.
  - .2 Use only insulation boards free from chipped or broken edges.
  - .3 Use largest possible dimensions to reduce number of joints.
- .6 Offset both vertical and horizontal joints in multiple layer applications.
- .7 Do not enclose insulation until it has been inspected and approved by the departmental representative.

### **3.2 EXAMINATION**

- .1 Prior to commencement of Work ensure:
  - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

### **3.3 RIGID INSULATION INSTALLATION**

- .1 Provide Type IV XPS
- .2 Apply adhesive to insulation board or use plastic insulation fasteners in accordance with manufacturer's recommendations.
- .3 Cut, fit, stagger and butt joints tight.
- .4 Foam fill voids with foam insulation.
- .5 Coordinate work with placement of vapour retarder.

### **3.4 SEMI RIGID INSULATION INSTALLATION**

- .1 Provide Type 4B Rock Wool
- .2 Secure with insulation clips where required to prevent sagging.
- .3 Cut, fit, stagger and butt joints tight.
- .4 Foam fill voids with foam insulation.

### **3.5 BATT AND SOUND INSULATION INSTALLATION**

- .1 Interior application: install where indicated.
- .2 Cut, fit and butt joints tight.
- .3 Secure with insulation clips or other means where required to prevent sagging.
- .4 Stagger Joints.

**3.6 EXPANDING FOAM INSULATION INSTALLATION**

- .1 Apply in accordance with CAN/ULC S710.2 and manufacturer's written instructions.
- .2 Apply expanding foam to fill irregular voids and cracks and to interface with building envelope.
- .3 Use around doors, windows, louvers, annular spaces around pipes and ducts and other openings or protrusions through walls, floors and roofs.
- .4 Apply to underside of roof drains and between insulation sheets.
- .5 Completely fill concrete block vertical cells where plumbing and heating lines occur to insulate lines.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 06 10 11 - Rough Carpentry
- .2 Section 07 26 00 – Vapour Retarder
- .3 Section 07 27 10 – Modified Bituminous Sheet Air Barrier
- .4 Section 08: - Foam fill at doors and windows

**1.2 REFERENCES**

- .1 All References are to be the latest edition or latest edition adopted by the authorities having jurisdiction including all adopted addendums.
- .2 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)
- .3 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101-05, Fire Endurance Tests of Building Construction and Materials.
  - .2 CAN/ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .3 CAN/ULC-S705.1-15, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
  - .4 CAN/ULC-S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.

**1.3 QUALITY ASSURANCE**

- .1 Applicators to conform to CUFCA Quality Assurance Program.
- .2 Health and Safety Requirements: worker protection minimum:
  - .1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:

**1.4 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Product Data: Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Quality assurance submittals:
  - .1 Test reports: submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
  - .2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.



## **1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle materials in accordance with contract requirements and in accordance with manufacturer's written instructions.

## **1.6 SITE CONDITIONS**

- .1 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.
- .2 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.
- .3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.
- .4 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Insulation: spray polyurethane to CAN/ULC-S705.1., medium density, two-part; minimum LTTR of RSI 1.02 mm / 25 mm when tested to CAN/ULC S770.
  - .1 Primers: Non-water based in accordance with manufacturer's recommendations for surface conditions.
  - .2 Maximum VOC limit 250 g/l when tested in accordance with USEPA Method 24 and ASTM D2369.
  - .3 Miscellaneous accessories as recommended by insulation manufacturer for installation of insulation.
- .2 Air / Vapour Barrier Membrane: To Section 07 27 00 Air Barriers.
  - .1 Product to be compatible and acceptable to insulation manufacturer to be used with insulation.

## **Part 3 Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 APPLICATION**

- .1 Prepare substrate as recommended by manufacturer and as detailed.
- .2 Provide adequate ventilation.
- .3 Install air / vapour barrier membrane at all joints in substrate such as between concrete block and concrete block, concrete block and steel columns, dissimilar materials and as recommended by manufacturer.
- .4 Install metal angle trim at base and top of walls and around openings as recommended by manufacturer.
- .5 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions.
- .6 Use primer where recommended by manufacturer.
- .7 Apply sprayed foam insulation minimum thickness of 90 mm and as required.
- .8 Apply foam in uniform thickness.
- .9 Maximum 50 mm thick per lift.
  - .1 Foam must be fully cured before subsequent lift are to be sprayed.
- .10 Field sand / trim to provide plumb / flat surface.
- .11 Apply additional foam where foam is damaged or as required for completely uniform installation.

### **3.3 FIELD QUALITY CONTROL**

- .1 Insulation to be installed under cover provided by Spray Insulation Contractor to:
  - .1 Localize off-spray and odours.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 07 21 00 - Building Insulation.
- .2 Section 07 26 16 – Under slab Vapour Retarder.
- .3 Section 07 27 10 – Modified Bituminous Sheet Air Barrier
- .4 Section 07 92 00 - Joint Sealants.

**1.2 REFERENCES**

- .1 All References are to be the latest edition or latest edition adopted by the authorities having jurisdiction including all adopted addendums.
- .2 ASTM E1643-11, Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- .3 ASTM E1745-11, Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- .4 CAN/CGSB-51.34-M86, Vapour Retarder, Polyethylene Sheet, for Use in Building Construction.

**1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- .3 Manufacturer's Installation Instructions: Indicate preparation and installation requirements, techniques.

**1.4 SEQUENCING**

- .1 Sequence Work to permit installation of materials in conjunction with other retardant materials and seals, and air barrier assemblies.
- .2 Do not install vapour retarder until items penetrating it are in place.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle materials in accordance with contract requirements and in accordance with manufacturer's written instructions.

**Part 2 Products**

**2.1 SHEET MATERIALS**

- .1 Polyethylene Vapour Retarder: Listed to CAN/CGSB-51.34M86, polyethylene film, 6 mil thick.

## **2.2 ACCESSORIES**

- .1 Seam tape: pressure sensitive type recommended by manufacturer.
- .2 Pipe Boot: Construct pipe boots from vapour barrier material and pressure sensitive tape per manufacturer's instructions; alternatively, provide manufacturers' pre-moulded pipe boot.
- .3 Sealant: Acoustical Sealant, specified in Section 07 92 00

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Remove loose or foreign matter which might impair adhesion.
- .2 Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturers' written instructions.

### **3.2 POLYETHYLENE VAPOUR RETARDER**

- .1 Install vapour retarder in exterior envelope surfaces without gaps or voids.
- .2 Lap joints minimum 150 mm and seal with butyl sealant.
- .3 Patch all holes and tears.
- .4 Place vapour retarder so that it is on the warm side of the insulation.
- .5 Adhere vapour retarder to steel framing and to perimeter using acoustical sealant.
- .6 Extend vapour retarder tight to full perimeter of adjacent window and door frames and other items interrupting the plane of membrane.
- .7 Seal in place with acoustical sealant.
- .8 Coordinate vapour barrier and air seal sections.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 03 35 00 Concrete Finishing
- .2 Section 07 92 00 - Joint Sealants.
- .3 Mechanical Sections.
- .4 Electrical Sections.

**1.2 REFERENCES**

- .1 ASTM C1193-16, Standard Guide for Use of Joint Sealants.
- .2 ASTM E96 / E96M-16, Test Methods for Water Vapour Transmission of Materials.
- .3 ASTM E1643-11, Standard Practice for Selection, Design, Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- .4 ASTM E1745-11, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

**1.1 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- .3 Manufacturer's Installation Instructions: Indicate preparation and installation requirements, techniques.
- .4 Provide two (2) 300mm x 300 mm samples for review.

**1.3 SEQUENCING**

- .1 Sequence Work to permit installation of materials in conjunction with other retardant materials and seals, and air retarder assemblies.
- .2 Do not install vapour retarder until items penetrating it are in place.

**1.2 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

**Part 2 Products**

**2.1 SHEET MATERIALS**

- .1 Underslab Vapour Retarder: Polyolefin film to ASTM E1745-11, Class A, minimum 10 mil thickness, for underslab applications;

**2.2 ACCESSORIES**

- .1 Seam tape: pressure sensitive type recommended by manufacturer.
- .2 Pipe Boot: Construct pipe boots from vapour retarder material and pressure sensitive tape per manufacturer's instructions; alternatively, provide manufacturers' pre-moulded pipe boot.
- .3 Sealant: as specified in Section 07 92 00.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Remove loose or foreign matter which might impair adhesion.
- .2 Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturers' written instructions.

**3.2 UNDERSLAB VAPOUR RETARDER INSTALLATION**

- .1 Install vapour retarder over rigid insulation.
- .2 Install in accordance with manufacturer's written instructions and ASTM E1643-11.
- .3 Unroll vapour retarder with long dimension parallel with direction of concrete slab pour.
- .4 Lap vapour retarder over footings and seal to foundation walls and grade beams.
- .5 Overlap joints 150 mm and seal with manufacturer's tape.
- .6 Seal around mechanical and electrical services, support columns or other penetration with pipe boot.
- .7 Seal to perimeter foundation with sealant specified under Section 07 92 00.
- .8 Repair damaged areas by cutting patches of vapour retarder, overlapping damaged area 150 mm and taping four sides with tape.

**END OF SECTION**

**Part 1            General**

**1.1            RELATED REQUIREMENTS**

- .1    Section 07 46 23 – Wood Siding
- .2    Section 07 62 00 – Sheet Metal Flashing and Trim
- .3    Section 07 27 10 - Modified Bituminous Sheet Air Barrier.
- .4    Section 07 92 00 – Joint Sealants
- .5    Section 08 11 00 - Metal Doors and Frames
- .6    Section 08 50 00 – Windows
- .7    Section 08 90 00 - Louvres and Vents

**1.2            REFERENCES**

- .1    American Society for Testing and Materials (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    ASTM C 920-14a; Standard Specification for Elastomeric Joint Sealants.
  - .3    ASTM C 1193-16; Standard Guide for Use of Joint Sealants.
  - .4    ASTM D4263-83(2012), Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
  - .5    ASTM E 84-16: Test Method for Surface Burning Characteristics of Building Materials.
  - .6    ASTM E 96/E96M-16: Standard Test Methods for Water Vapour Transmission of Materials.
  - .7    ASTM E 283-04(2012): Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  - .8    ASTM E783-02(2010), Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
  - .9    ASTM E1105-15, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference.
  - .10    ASTM E1186-03(2009), Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
  - .11    ASTM E 2112-07(2016): Standard Practice for Installation of Exterior Windows, Doors and Skylights.
  - .12    ASTM E 2178-13: Standard Test Method for Air Permeance of Building Materials.
  - .13    ASTM E 2357-11: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

### **1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Provide data indicating material characteristics, performance criteria, and limitations. Include data sheets for membrane, primers, and sealants.
- .3 Manufacturer's Installation Instructions: Indicate preparation, installation requirements and techniques, and product storage and handling criteria.

### **1.4 QUALITY ASSURANCE**

- .1 Perform Work in accordance with manufacturer's written instructions and this specification.

### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

### **1.6 CO-ORDINATION**

- .1 Ensure continuity of the water resistive air barrier throughout the scope of this Section.
- .2 Sequence work to permit installation of materials in conjunction with related materials and seals.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Air Barrier Membrane: Water resistant and vapour permeable; self-adhering reinforced sheet air barrier membrane for wall construction.
  - .1 Provide related accessories including non-water based primer, seam tape, mastic, fluid and sealant recommended by manufacturer.
- .2 Transition Membrane: AB membrane, field-cut to suit.
  - .1 Alternatively, provide manufacturer's membrane tape.
- .3 Galvanized Steel: Membrane support, to ASTM A653/A653M-15e1, Z275 (G90) finish; 0.60 mm (24 gauge) core steel.
- .4 Pressure Plate: Aluminum extrusion or galvanized pressure plate / transition bar with sealant trough surface.
- .5 Sealant: Two-part, VOC compliant elastomeric, trowel grade material designed for use with self-adhered membranes and tapes.



**Part 3 Execution**

**3.1 MANUFACTURER'S INSTRUCTIONS**

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

**3.2 EXAMINATION**

- .1 Verify that surfaces and conditions are ready to accept the Work of this section.
  - .1 Report unsatisfactory conditions to Departmental Representative in writing.
  - .2 Do not start work until deficiencies have been corrected.
  - .3 Commencement of the Work or any parts thereof shall mean acceptance of the prepared substrates.
- .2 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the membranes.
- .3 Do not install AB membrane until items penetrating it are in place.

**3.3 SURFACE PREPARATION**

- .1 Ensure all preparatory Work is complete prior to applying primary air barrier membrane.
- .2 Clean, prepare, and treat substrate according to AB membrane manufacturer's written instructions.
- .3 Membrane must be installed over primer even those which the manufacturer professes can be installed without primer.
  - .1 Apply primer at rate recommended by manufacturer prior to membrane installation.
  - .2 Allow primer to dry completely before membrane application.
  - .3 Prime substrate and membrane surfaces to be adhere to with an adequate number of coats to achieve required bond, with adequate drying time between coats.
  - .4 Use non-water based primer only.
  - .5 Primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day must be re-primed.
- .4 Perform membrane adhesion tests over each substrate to which AB membrane is to be installed.
- .5 Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air and vapour barrier and at protrusions.
- .6 Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.

### **3.4 INSTALLATION OF AIR BARRIER SYSTEM**

- .1 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
- .2 Apply Air Barrier membrane only to primed surfaces.
- .3 Do not install Air Barrier membrane in snow, rain, fog or mist.
- .4 Install air and vapour barrier components and assemblies to resist air leakage caused by static air pressure across exterior wall assemblies and other interruptions to the integrity of the building enclosure systems as follows:
  - .1 Maximum air leakage rate of 0.02 L/sec·m<sup>2</sup> when subjected to a pressure differential of 75 Pa as measured in accordance with ASTM E 283-04(2012).
- .5 Air barrier system to be a continuous barrier to air infiltration, air exfiltration and allow water vapour transmission.
- .6 Air barrier system to act as a liquid water drainage plane, flashed to discharge condensation or water penetration.
- .7 Connections to Adjacent Materials to prevent air leakage at locations such as but not limited to:
  - .1 Foundation and walls, including penetrations, ties and anchors.
  - .2 Walls, windows, curtain walls, storefronts, louvers or doors.
  - .3 Different wall assemblies, and fixed openings within those assemblies.
  - .4 Wall and roof connections.
  - .5 Walls, floor and roof across construction, control and expansion joints.
  - .6 Walls, floors and roof to utility, pipe and duct penetrations.
  - .7 Seismic and expansion joints.
  - .8 All other leakage pathways in the building envelope.
  - .9 Make all penetrations of the Air Barrier membrane and paths of air infiltration/exfiltration airtight.
- .8 **INSIDE AND OUTSIDE CORNERS**
  - .1 Seal inside and outside corners of sheathing boards with a strip of self-adhering vapour permeable membrane extending a minimum of 75mm on either side of the corner detail.
    - .1 For inside corners, pre-treat the corner with a continuous 13mm bead of termination sealant.
    - .2 Prime surfaces where appropriate due to surface conditions, to achieve surface adhesion as per manufacturers' instructions and allow to dry.

- .3 Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 50 mm overlap at all side laps and 75 mm overlap at all end laps of membrane.
- .4 Roll all laps and membrane with a counter top roller to ensure seal.

.9 TRANSITION AREAS

- .1 Tie-into windows, doors, louvres, protrusions, and at the interface of dissimilar materials as indicated in drawings with self-adhered air barrier transition membrane.
  - .1 Prime surfaces where appropriate due to surface conditions, to achieve surface adhesion as per manufacturers' instructions and allow to dry.
  - .2 Align and position self-adhering transition membrane, remove protective film and press firmly into place. Provide minimum 75 mm lap to all substrates.
  - .3 Ensure minimum 50 mm overlap at all side laps and 75 mm overlap at all end laps of membrane.
  - .4 Roll all laps and membrane with a counter top roller to ensure seal.

.10 WINDOWS AND ROUGH OPENINGS

- .1 Place self-adhered window sill pan flashing membrane across window sills.
  - .1 Pre-treat inside corners with a bead of termination sealant.
  - .2 Install window sill pan membrane and end dam terminations, seal cuts and terminations with termination sealant per window manufacturer's instructions and ASTM E2112-07(2016):
- .2 Wrap head and jamb of rough openings with specified self-adhered water resistive air barrier transition membrane as detailed.
- .3 Extend specified self-adhered water resistive air barrier membrane into rough window openings sufficient to provide a connection to interior vapour retarder.
  - .1 Prime surfaces where appropriate to achieve surface adhesion as per manufacturers' instructions and allow to dry.
  - .2 Align and position self-adhering transition membrane, remove protective film and press firmly into place.
    - .1 Ensure minimum 50 mm overlap at all side laps and 75 mm overlap at all end laps of membrane.
  - .3 Roll all laps and membrane with a counter top roller to ensure seal.

**.11 PRIMARY WATER RESISTIVE AIR BARRIER**

- .1 Apply self-adhering water resistive air barrier membrane complete and continuous to substrate in an overlapping shingle fashion and in accordance with manufacturer's recommendations and written instructions.
  - .1 Stagger all vertical joints.
  - .2 Prime surfaces to achieve surface adhesion as per manufacturers' instructions and allow to dry.
  - .3 Align and position self-adhering membrane to substrate, remove top panel of protective release film and press firmly into place.
  - .4 Ensure alignment, hold membrane in place to avoid wrinkles and sequentially remove remaining panels of protective film and press firmly into place.
  - .5 Ensure minimum 75 mm overlap at all end and 50 mm side laps of subsequent membrane applications.
  - .6 Pressure roll all membrane surfaces, laps and flashings with a counter top roller or 'J-roller' to ensure appropriate surface adhesion.
  - .7 At the end of each day's work seal the top edge of the membrane where it meets the substrate with termination sealant. Trowel apply a feathered edge to seal termination and shed water.

**3.5 APPLICATION OF TERMINATION SEALANT**

- .1 Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the primary water resistive air barrier membrane and around the perimeter edge of membrane terminations at window and door frames with specified termination sealant.

**3.6 FIELD QUALITY CONTROL**

- .1 Make notification when sections of Work are complete to allow review prior to covering air barrier system.

**3.7 PROTECTION**

- .1 Damp substrates must not be inhibited from drying out.
  - .1 Do not expose the backside of the substrate to moisture or rain.
- .2 Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed air barrier installations.
- .3 Water resistive air barrier membrane is not designed for permanent exposure. Cover as soon as possible, not to exceed 90 days.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 04 04 99 – Masonry for Minor Works
- .2 Section 04 43 26 – Dimensional Stone Veneer Cladding
- .3 Section 07 27 00 – Air Barrier
- .4 Section 07 46 23 – Wood Siding
- .5 Section 07 92 00 – Joint Sealants
- .6 Section 08 11 00 - Metal Doors and Frames
- .7 Section 08 50 00 - Windows
- .8 Section 08 90 00 - Louvres and Vents

**1.2 REFERENCES**

- .1 American Society for Testing and Materials (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 ASTM C 920-14a; Standard Specification for Elastomeric Joint Sealants.
  - .3 ASTM C 1193-16; Standard Guide for Use of Joint Sealants.
  - .4 ASTM D4263-83(2012), Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
  - .5 ASTM D4541-09e1, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
  - .6 ASTM E96/E96M-16, Standard Test Methods for Water Vapour Transmission of Materials.
  - .7 ASTM E1186-03(2009), Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
  - .8 ASTM E 2357-11: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

**1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Provide data indicating material characteristics, performance criteria, and limitations. Include data sheets for membrane, primers, and sealants.
- .3 Manufacturer's Installation Instructions: Indicate preparation, installation requirements and techniques, and product storage and handling criteria.

#### **1.4 ENVIRONMENTAL REQUIREMENTS**

- .1 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
- .2 Do not apply AVB membrane to damp or wet substrates.
- .3 Do not install AVB membrane in snow, rain, fog or mist.

#### **1.5 COORDINATION**

- .1 Coordinate the work of this section with all sections referencing this Section.
- .2 Ensure continuity of the water resistive air barrier throughout the scope of this section.
- .3 Sequence work to permit installation of materials in conjunction with related materials and seals.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Self-Adhered Air Barrier Membrane: SBS-modified membrane, minimum 1.0 mm (40 mil) thickness, water resistant:
  - .1 Use regular or low-temperature formulation depending on site conditions, within temperature ranges specified by membrane manufacturer.
  - .2 Provide related accessories including primer, seam tape, mastic, fluid and sealant recommended by manufacturer.

#### **2.2 ACCESSORIES**

- .1 Transition Membrane: manufacturer's membrane tape.
- .2 Galvanized Steel: Membrane support, to ASTM A653/A653M-15e1, Z275 (G90) finish; 0.60 mm (24 gauge) core steel.
- .3 Pressure Plate /Termination Bar: Painted Aluminum extrusion or formed 18 gauge sheet metal pressure plate /termination bar with sealant trough.
- .4 Sealant: Two-part, elastomeric, trowel grade material designed for use with self-adhered membranes and tapes.

## **Part 3            Execution**

### **3.1                MANUFACTURER'S INSTRUCTIONS**

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

### **3.2                PERFORMANCE REQUIREMENTS**

- .1        Install air and vapour barrier components and assemblies to resist air leakage caused by static air pressure across exterior wall assemblies and other interruptions to the integrity of the building enclosure systems as follows:
  - .1        Maximum air leakage rate of 0.02 L/sec.m<sup>2</sup> when subjected to a pressure differential of 75 Pa as measured in accordance with ASTM E283-04(2012).
  - .2        Maximum vapour permeance of 0.1 perms when tested according to ASTM E96/E96M-16.
- .2        Air and vapour barrier system to be a continuous barrier to air infiltration, air exfiltration and water vapour transmission.
- .3        Air and vapour barrier system to act as a liquid water drainage plane, flashed to discharge condensation or water penetration.
- .4        Connections to Adjacent Materials: Provide connections to prevent air leakage and vapour migration at all possible locations including but not limited to the following locations:
  - .1        Foundation and walls, including penetrations, ties and anchors.
  - .2        Walls, windows, curtain walls, storefronts, louvers or doors.
  - .3        Different wall assemblies, and fixed openings within those assemblies.
  - .4        Wall and roof connections.
  - .5        Floors over unconditioned space.
  - .6        Walls, floor and roof across construction, control and expansion joints.
  - .7        Walls, floors and roof to utility, pipe and duct penetrations.
  - .8        Seismic and expansion joints.
  - .9        All other leakage pathways in the building envelope.
  - .10       Make all penetrations of the AVB membrane and paths of air infiltration/exfiltration airtight.

### **3.3                EXAMINATION**

- .1        Examine substrates, areas, and conditions under which air and vapour barrier assemblies will be applied, with Applicator present, for compliance with requirements.
- .2        Verify that surfaces and conditions are suitable prior to commencing work of this Section.
  - .1        Do not proceed with installation until unsatisfactory conditions have been corrected.

- .3 Ensure that surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants.
- .4 Ensure that concrete surfaces are cured and dry, smooth without large voids, spalled areas or sharp protrusions.
- .5 Verify substrate is visibly dry and free of moisture.
- .6 Do not install AVB membrane until items penetrating it are in place.

### **3.4 SURFACE PREPARATION**

- .1 Ensure all preparatory Work is complete prior to applying primary air barrier membrane.
- .2 Clean, prepare, and treat substrate according to AVB membrane manufacturer's written instructions.
- .3 Membrane must be installed over primer even those which the manufacturer professes can be installed without primer.
  - .1 Apply primer at rate recommended by manufacturer prior to membrane installation.
  - .2 Allow primer to dry completely before membrane application.
  - .3 Prime substrate and membrane surfaces to be adhere to with an adequate number of coats to achieve required bond, with adequate drying time between coats.
  - .4 Use non-water based primer only.
  - .5 Primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day must be re-primed.
- .4 Perform membrane adhesion tests over each substrate to which AVB membrane is to be installed.
- .5 Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air and vapour barrier and at protrusions.
- .6 Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.

### **3.5 INSTALLATION OF AVB MEMBRANE**

- .1 Install AVB membrane to provide continuity throughout the building envelope.
- .2 Install materials in accordance with manufacturer's written recommendations and the following:
  - .1 When self-adhering membrane is properly positioned, press into place and roll membrane with roller immediately after placement.
  - .2 Overlap adjacent sheets in accordance with manufacturer's written recommendations. Roll seams with roller.
  - .3 Seal around all penetrations with termination mastic, sealant, or membrane tape in accordance with manufacturer's written recommendations.



- .4 Connect AVB membrane continuously to roof vapour barrier, concrete below grade structures, windows, curtain wall, storefront, louvers, exterior doors and other intersection conditions.
- .5 Seal penetrations using accessory materials in accordance with the manufacturer's written recommendations.
- .6 Provide transition material at changes in substrate plane under AVB membrane to eliminate sharp inside corners and to smooth transition from one plane to another.
- .7 Provide mechanically fastened metal sheet to span gaps in substrate plane and to smooth transition from one plane to another.
  - .1 Continuously support AVB membrane at all transitions.
- .8 Provide backup for AVB membrane at deflection and control joints to accommodate anticipated movement.
- .9 Provide transition at expansion and seismic joints assemblies.
- .3 Install Pressure Plate /Termination Bars at all termination edges of membrane.

### **3.6 INSTALLATION OF AIR BARRIER SYSTEM**

- .1 PRIMARY WATER RESISTIVE AIR BARRIER
  - .1 Apply self-adhering water resistive air barrier membrane complete and continuous to substrate in an overlapping shingle fashion and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.
    - .1 Prime surfaces to achieve surface adhesion as per manufacturers' instructions and allow to dry.
    - .2 Align and position self-adhering membrane to substrate, remove top panel of protective release film and press firmly into place.
    - .3 Ensure alignment, hold membrane in place to avoid wrinkles and sequentially remove remaining panels of protective film and press firmly into place.
    - .4 Ensure minimum 75 mm overlap at all end and 50 mm side laps of subsequent membrane applications.
    - .5 Pressure roll all membrane surfaces, laps and flashings with a counter top roller or 'J-roller' to ensure appropriate surface adhesion.
    - .6 At the end of each day's work seal the top edge of the membrane where it meets the substrate with termination sealant. Trowel apply a feathered edge to seal termination and shed water.
    - .7 Install Pressure Plate /Termination Bars at all termination edges of membrane.

.2 TRANSITION AREAS

- .1 Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials as indicated in drawings with self-adhered air barrier transition membrane.
  - .1 Prime surfaces where appropriate due to surface conditions, to achieve surface adhesion as per manufacturers' instructions and allow to dry.
  - .2 Align and position self-adhering transition membrane, remove protective film and press firmly into place. Provide minimum 75 mm lap to all substrates.
  - .3 Ensure minimum 50 mm overlap at all side laps and 75 mm overlap at all end laps of membrane.
  - .4 Roll all laps and membrane with a counter top roller to ensure seal.

.3 WINDOWS AND ROUGH OPENINGS

- .1 Install pre-moulded corners at all interior corners.
- .2 Place specified SBS modified self-adhered window sill pan flashing membrane across window sills. Pre-treat inside corners with a bead of termination sealant. Install window sill pan membrane and end dam terminations, seal cuts and terminations with termination sealant per window manufacturer's instructions and ASTM E 2112-07(2016).
- .3 Wrap head and jamb of rough openings with specified self-adhered water resistive air barrier transition membrane as detailed.
- .4 Extend specified self-adhered water resistive air barrier membrane into rough window openings sufficient to provide a connection to interior vapour retarder.
  - .1 Prime surfaces where appropriate to achieve surface adhesion as per manufacturers' instructions and allow to dry.
  - .2 Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 50 mm overlap at all side laps and 75 mm overlap at all end laps of membrane.
  - .3 Roll all laps and membrane with a counter top roller to ensure seal.

**3.7 APPLICATION OF TERMINATION SEALANT**

- .1 Seal membrane terminations, heads of mechanical fasteners, around penetrations, duct work, electrical and other apparatus extending through the primary water resistive air barrier membrane and around the perimeter edge of membrane terminations at window and door frames with specified termination sealant.

**3.8 FIELD QUALITY CONTROL**

- .1 Make notification when sections of Work are complete to allow review prior to covering membrane.

### **3.9 PROTECTION**

- .1 Damp substrates must not be inhibited from drying out. Do not expose the backside of the substrate to moisture or rain.
- .2 Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed air barrier installations.
- .3 Water resistive air barrier membrane is not designed for permanent exposure.
  - .1 Cover as soon as possible, not to exceed 90 days.

### **3.10 CLEANING AND PROTECTION**

- .1 Protect air and vapour barrier assemblies from damage during application and remainder of construction period, according to manufacturer's written instructions.
- .2 Do not allow materials to come in contact with chemically incompatible materials.
- .3 Do not expose AVB membrane to sunlight longer than recommended by the manufacturer.
- .4 Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 08 99 – Rough Carpentry for Minor Works
- .2 Section 07 27 00 – Air Barrier
- .3 Section 07 27 10 - Modified Bituminous Sheet Air Barrier.
- .4 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .5 Section 07 92 00 - Joint Sealing.
- .6 Section 08 11 00 - Metal Doors and Frames
- .7 Section 08 50 00 - Windows
- .8 Section 08 90 00 - Louvres and Vents
- .9 Section 09 91 00 - Painting.

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A135.6-2012, Engineered Wood Siding.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .3 CSA International
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2 CSA O121-08 (R2013), Douglas Fir Plywood.
  - .3 CSA O141-05(R2014), Softwood Lumber.
  - .4 CSA O151-09 (R2014), Canadian Softwood Plywood.
- .4 National Lumber Grading Authority (NLGA)
  - .1 NLGA Standard Grading Rules for Canadian Lumber 2014.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for wood siding and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .4 Samples:
  - .1 Submit duplicate 600 mm long samples of all profiles specified.

## **1.4 QUALITY ASSURANCE**

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood siding from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Lumber siding: to NLGA Standard Grading Rules for Canadian Lumber 2014.
- .2 Siding:
  - .1 Bevel siding; 140 mm:
    - .1 Species: Western Lodgepole pine
    - .2 Kiln Dried.
    - .3 Grade: No 1; Defected to eliminate knot holes and end splits
    - .4 Pre- Finished: Two-coat 100% acrylic system on five sides (one coat on back).
    - .5 Pre-treated: Treated with wood preservative.
    - .6 Colour: From manufacturer's complete ranges; no restrictions.
- .3 Accessories: exposed trim, closures, cap pieces of manufacturer's standard, finish same as siding.
- .4 Strapping: to Section 06 08 99 – Rough Carpentry for Minor Works
- .5 Slope strapping for drainage for vertical siding
- .6 Exterior wall air barrier: to Section 07 27 00.
- .7 Fasteners: Siding and trim nails to B111-1974(R2003), hot galvanized steel, or stainless steel sized as required, spiral or ring thread type with oval finishing head.

- .8 Vent strip: 38 and 50 mm wide continuous non compressible vinyl vent strip.
- .9 Vent strip: Fiberglass fly screen for venting in locations shown.
- .10 Sealants: to Section 07 92 00.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.3 INSTALLATION**

- .1 Install hardboard to manufacturers' written instructions.
- .2 Install air barrier to Section 07 27 00.
- .3 Install strapping, ventilation strips, sill flashings, wood starter strips, inside corner flashings, edgings and flashings over openings.
- .4 Fasten wood siding in straight, aligned lengths to furring using two 2 nails at each fixing location.
  - .1 Stagger butt joints not less than 800 mm and distribute evenly over wall faces.
  - .2 Cut butt joints at 45 degrees and for vertical siding slope to outside.
  - .3 Seal cut surfaces.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 07 62 00 – Sheet Metal Flashing and Trim
- .2 Section 07 92 00 – Joint Sealants

**1.2 REFERENCES**

- .1 ASTM International
  - .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 ASTM D523-14, Standard Test Method for Specular Gloss.
  - .3 ASTM D822/D822M-13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit product data sheets for accessories.
- .3 Shop Drawings:
  - .1 Submit drawings Indicate arrangements of sheets and joints, flashings, types and locations of fasteners and special shapes and relationship of panels to structural frame.
- .4 Samples:
  - .1 Submit duplicate 300 x 300 mm samples of each sheet metal material.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 SHEET METAL MATERIALS**

- .1 Pre-painted Galvanized Steel Sheet: 0.60 mm thickness, zinc coated galvanized steel sheet to ASTM A653/A653M-15e1, Coating Designation G90 (Z275), shop pre-coated;
  - .1 Profiles: as noted on drawings

### **2.2 PREFINISHED STEEL SHEET**

- .1 Prefinished steel with factory applied Standard Series.
  - .1 Class: F2S.
  - .2 Green colour selected by Departmental Representative from manufacturer's unlimited standard range.
  - .3 Specular gloss: 30 units +/-5 to ASTM D523.
  - .4 Coating thickness: 200 micrometres minimum
  - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822/D822M-13 as follows:
    - .1 Outdoor exposure period 5000 hours minimum.
    - .2 Humidity resistance exposure period 5000 hours minimum.

### **2.3 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement.
- .3 Underlay: Self-adhering, waterproof membrane for high temperature applications, certified for use under specified metal roofing, slip-resistant surface.
- .4 Sealant: Compatible with systems materials, recommended by system manufacturer.
- .5 Exposed Sealant: Silicone, as specified in Section 07 92 00; colour to match sheet metal
- .6 Cleats: Manufacturer's standard, concealed type, designed to achieve FM I-90 uplift rating.



- .7 Flashings and accessories: Formed from same material as the metal roofing: Flashing to custom fabricated to profiles indicated or required.
- .8 Closures: Metal closures with foam back-up to match profiles, to provide complete watertight barrier.
- .9 Pipe Flashing: Pre-moulded EPDM flexible boot as recommended by roofing manufacturer, to suit pipe penetration outside diameter.
- .10 Fasteners: concealed.
- .11 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .12 Ridge vent: Pre-formed ridge with ventilation louvres and filter mesh material.
- .13 Deck Insulation / Sheathing:
  - .1 150 mm thick; poly isocyanurate insulation with 60 gauge kraft paper on one side and 15.7 mm plywood board on the top side.

## 2.4 DESIGN REQUIREMENTS

- .1 Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
- .2 Maximum Allowable Deflection of Panel: 1/90 of span.
- .3 Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.
- .4 Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
- .5 Design loads for the roofing to be determined in accordance with NBCC 2010. The following specified climatic loads apply:
  - .1 Driving Rain Wind Pressure: Pa, 1/5 : 260.
  - .2 Snow Load Pa, 1/50:
    - .1 Ss: 2.3
    - .2 Sr: 0.6
  - .3 Hourly Wind Pressure, kPa:
    - .1 1/10: 0.37
    - .2 1/50: 0.48

## 2.5 FABRICATION

- .1 Fabricate sheet metal roofing components to comply with dimensions, profiles, gauges and details shown on reviewed shop drawings.
- .2 Form components whenever possible prior to delivery to site.

- .3 Provide roof sheet and accessories in longest practical length to minimize field lapping.
- .4 Make allowances for expansion and contraction due to solar heat gain and ambient temperatures without damaging panel system performance.
- .5 Hem exposed edges on underside 13 mm, mitre and seal.
- .6 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .7 Protect metals against oxidization by back painting with isolation coating where indicated.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sheet metal roofing installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Departmental Representative.

#### **3.2 DECK insulation / SHEATHING**

- .1 Install insulation / sheathing onto the steel deck to Factory Mutual requirements, bulletin 1-28 for installation of boards to roof perimeters and corners, to meet 1-90.
- .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, using number of fasteners with washers per board as required to achieve FM 1-90 rating.
- .4 Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.

#### **3.3 INSTALLATION**

- .1 Use concealed fastenings except where approved in writing by Departmental Representative before installation.
- .2 Provide termination flashings at eaves, rake and ridge as indicated.
- .3 Install underlay membrane to all locations under metal components for a watertight system.
  - .1 Secure in place and lap joints 100 mm minimum.
  - .2 Install slip sheet over membrane as required by manufacturer.

- .4 Install sheet metal roof panels in accordance with manufacturer's written instructions.
- .5 Apply sheet metal roofing beginning at eaves.
- .6 Align transverse seams in adjacent panels.
- .7 Form seams in direction of water-flow and make watertight.
- .8 Provide metal and foam closures.
- .9 Provide expansion joints where required or recommended by manufacturer.
- .10 Flash roof penetrations with material matching roof panels, and make watertight.
- .11 Form seams in direction of water-flow and make watertight.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 07 61 00 - Sheet Metal Roofing
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim
- .3 Section 07 92 00 – Joint Sealants

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit product data sheets for accessories.
- .3 Shop Drawings:
  - .1 Submit drawings indicating arrangements of snow guards, joints, types and locations of fasteners and special shapes and relationship to roofing and structure.
  - .2 Provide design for snow guards including mounting devices, securement to roofing and number of rows required.
  - .3 Shop drawings shall be stamped and signed by a professional engineer registered and licenced to practice in the Province of New Brunswick.
- .4 Samples:
  - .1 Submit duplicate samples of each component.

**1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2        Products**

### **2.1        COMPONENTS**

#### **.1        Snow Guard:**

1.        Show guard to be non-penetrating system. Attachment to be by set screws for clamping snow guard brackets to standing seam of metal roof.
2.        Maximum spacing of snow guard support brackets to be nominal 812 mm. Maximum overhang of tubes beyond brackets not to exceed 300 mm.
3.        Snow guard system to consist of minimum two 38 mm diameter by 1.65 mm thick walled galvalume tubes, finish painted to match roof cladding. Tubes to have swaged ends.
4.        Support brackets to be finish of same colour as tubes, complete with crimped and welded aluminum extruded base. Base to be fastened, (clamped) to standing seam with 9.5 mm diameter stainless steel set screws.
5.        Exact location of snow guards to be field confirmed with Departmental Representative at time of construction.
6.        Snow guard system to be designed by the manufacturer to suit roof system to which it is to be attached. Design calculations and shop drawings to bear the stamp and signature of a professional engineer registered and licenced to practice in the Province of Newfoundland. No work to proceed until shop drawing calculations have been reviewed by the Departmental Representative.

### **2.2        DESIGN REQUIREMENTS**

- .1        Spacing to be recommended by manufacturer
- .2        Minimum 3 fasteners per snow guard bracket.
- .3        Design loads for snow guards to be determined in accordance with NBCC 2010. The following specified climatic loads apply:
  - .1        Driving Rain Wind Pressure: Pa, 1/5 : 260.
  - .2        Snow Load Pa, 1/50:
    - .1        Ss: 2.3
    - .2        Sr: 0.6
  - .3        Hourly Wind Pressure, kPa:
    - .1        1/10: 0.37
    - .2        1/50: 0.48

**Part 3          Execution**

**3.1              EXAMINATION**

- .1      Inspect structure on which snow guard system is to be installed and verify that roofing material has been installed correctly prior to installing snow guards.

**3.2              INSTALLATION**

- .1      Comply with architectural drawings and snow guard manufacturer's recommendations for location of system.
- .2      Comply with manufacturer's written installation instructions for installation and layout.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 07 46 23 – Wood Siding
- .2 Section 07 27 10 - Modified Bituminous Sheet Air Barrier.
- .3 Section 07 61 00 - Sheet Metal Roofing
- .4 Section 08 90 00 - Louvres and Vents

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A240/A240M-16, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .2 ASTM A606/A606M-15, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
  - .3 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM D523-14, Standard Test Method for Specular Gloss.
  - .5 ASTM D822 / D822M – 13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
  - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.

**1.4 DELIVERY, STORAGE AND HANDLING**

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

**Part 2 Products**

**2.1 SHEET METAL MATERIALS**

- .1 Zinc coated steel sheet: mm thickness, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

**2.2 SHEET METAL MATERIALS**

- .1 Pre-painted Galvanized Steel Sheet: 0.60 mm thickness, zinc coated galvanized steel sheet to ASTM A653/A653M-15e1, Coating Designation G90 (Z275), shop pre-coated;
  - .1 Profiles: as noted on drawings

**2.3 PREFINISHED STEEL SHEET**

- .1 Prefinished steel with factory applied polyvinyl chloride Barrier Series.
  - .1 Class: F2S.
  - .2 Green colour selected by Departmental Representative from manufacturer's standard range.
  - .3 Specular gloss: 30 units +/-5 to ASTM D523.
  - .4 Coating thickness: 200 micrometres minimum
  - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822 / D822M – 13 as follows:
    - .1 Outdoor exposure period 5000 hours minimum.
    - .2 Humidity resistance exposure period 5000 hours minimum.

**2.4 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement.
- .3 Sealant: Compatible with systems materials, recommended by system manufacturer.
- .4 Exposed Sealant: Silicone, as specified in Section 07 92 00; colour to match sheet metal
- .5 Flashings and accessories: Formed from same material as the metal roofing: Flashing to custom fabricated to profiles indicated or required.
- .6 Fasteners: Concealed.
  - .1 Where not possible to be concealed, provide plastic covered hex head screw complete with rubber gasket, colour match to sheet metal.



## **2.5 FABRICATION**

- .1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .2 Form pieces in longest possible lengths.
- .3 Make allowances for expansion and contraction due to solar heat gain and ambient temperatures without damaging panel system performance.
- .4 Hem all exposed edges on underside 13 mm; miter and seam corners.
- .5 Form material with flat lock seams.
- .6 Fabricate vertical faces with bottom edge formed outward 6 mm and hemmed to form drip.
- .7 Fabricate flashings for, base of wall, headers, windows, louvers and other openings to profiles indicated and as required to provide drip edge and water seal and substrate protection.
- .8 Coordinate installation with work of other sections.
- .9 Protect metals against oxidization by back painting with isolation coating where indicated.

## **2.6 GUTTERS AND DOWNPIPES**

- .1 Form gutters and downpipes from aluminum 0.81 mm thick prefinished Kynar finish. Colour selected by Departmental Representative.
- .2 Sizes and profiles: ½ round, 150 mm x .084 mm.
- .3 Provide end caps, strip miters, goosenecks, outlets, leaf screens and necessary fastenings.
- .4 Provide:
  - .1 Fascia Brackets: Plain Wedges where required.
  - .2 Funnel Outlet: With maple leaf emblem applied.
  - .3 Downspouts: Smooth, round, 100 mm x .061 mm
  - .4 Elbows: Smooth, round
  - .5 Downspout brackets: Cast plain.
  - .6 Acceptable product:
    - .1 Classic Gutter Systems
    - .2 Approved Alternate.

## **Part 3 Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 PREPARATION**

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

### **3.3 INSTALLATION**

- .1 Secure flashings in place using concealed fasteners.
  - .1 Use exposed fasteners only where permitted.
- .2 Fit flashings tight in place.
  - .1 Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- .3 Seal metal joints watertight.

### **3.4 GUTTERS AND DOWNPIPES**

- .1 Install gutters and secure to building as per manufacturers recommendations, minimum 750 mm on centre with fascia brackets.
  - .1 Slope gutters to downpipes as indicated.
  - .2 Seal joints watertight with strip miters.
- .2 Install downspout and provide goosenecks back to wall.
  - .1 Secure downspout to wall with downspout brackets at 1800 mm on centre; minimum two brackets per downspout.
  - .2 Connect downspout to drainage system and seal joint.

### **3.5 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

**Part 1            General**

**1.1               RELATED REQUIREMENTS**

- .1      Section 04 43 26 – Dimensional Stone Veneer Cladding
- .2      Section 07 26 16 – Underslab Vapour Retarders
- .3      Section 07 27 00 – Air Barriers
- .4      Section 07 27 10 - Modified Bituminous Sheet Air Barrier.
- .5      Section 07 46 23 – Wood Siding.
- .6      Section 07 61 00 – Sheet Metal Roofing.
- .7      Section 07 62 00 - Sheet Metal Flashing and Trim.
- .8      Section 08 11 10 - Standard Metal Doors and Frames.
- .9      Section 08 50 00 - Aluminum Windows.
- .10     Section 08 90 00 - Louvres and Vents
- .11     Section 09 21 16 - Gypsum Board Assemblies.
- .12     Section: Mechanical
- .13     Section: Electrical

**1.2               REFERENCES**

- .1      ASTM International
  - .1      ASTM C834-14, Standard Specification for Latex Sealants.
  - .2      ASTM C919-12, Standard Practice for Use of Sealants in Acoustical Applications.
  - .3      ASTM C920-14a, Standard Specification for Elastomeric Joint Sealants
  - .4      ASTM C 1330-02(2013), Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
- .2      Canadian General Standards Board (CGSB)
  - .1      CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .2      CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .3      CAN/CGSB-19.24-M80, Multi-component, Chemical Curing Sealing Compound.
- .3      General Services Administration (GSA) - Federal Specifications (FS)
  - .1      SS-S-200-E, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Manufacturer's product to describe:
    - .1 Caulking compound.
    - .2 Primers.
    - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Samples:
  - .1 Submit 2 samples of each type of material and colour.
  - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .4 Manufacturer's Instructions:
  - .1 Submit instructions to include installation instructions for each product used.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

### **1.5 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 Proceed with installation of joint sealants only when:
    - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
    - .2 Joint substrates are dry.
    - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

- .2 Joint-Width Conditions:
  - .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
  - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

## **Part 2 Products**

### **2.1 SEALANT MATERIALS**

- .1 Where sealants are qualified with primers use only these primers.

### **2.2 SEALANT MATERIAL DESIGNATIONS**

- .1 Acoustical sealant: to ASTM C919-12, single component, non-hardening, non-skinning, synthetic rubber.
- .2 Acrylic latex: to ASTM C 834-14, single component general purpose siliconized acrylic latex sealant.
- .3 Epoxy, flexible: Poured flexible 100% solids epoxy joint filler.
- .4 Polyurethane, self-levelling: to ASTM C 920-14a, Type S, Grade P, Class 25, single component self-levelling polyurethane sealant with plus or minus 25 percent movement capability for horizontal joints.
- .5 Silicone, one part: to ASTM C 920-14a, Type S, Grade NS, Class 25, single component neutral cure silicone sealant, plus minus 50% joint movement capability.
- .6 Silicone, mildew resistant: to ASTM C 920-14a, single component mildew resistant silicone sealant, +/- 25% movement capability.

### **2.3 ACCESSORIES**

- .1 Primer: Type recommended by the sealant manufacturer and compatible with joint forming materials.
- .2 Joint Cleaner: Non-corrosive and non-staining type recommended by sealant manufacturer and compatible with joint forming materials.
- .3 Closed-Cell Backer Rod: to ASTM C 1330-02(2013), closed-cell polyethylene rod designed for use with cold-applied joint sealants for on-grade or below-grade applications. Size required for joint design.
- .4 Joint Filler: closed-cell polyethylene joint filler designed for use in cold joints, construction joints, or isolation joints wider than 6 mm. Size required for joint design.
- .5 Bond Breaker: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

## 2.4 SEALANT SCHEDULE

- .1 The following schedule covers locations requiring sealant whether shown on the drawings or not.
  - .1 All cracks and joints are to be caulked.
    - .1 Locations not included in this schedule shall be caulked at the discretion of the Consultant at no extra cost.
- .2 Perimeters of exterior openings where frames meet exterior of building.
  - .1 Sealant type: Silicone, one part.
- .3 All other exterior applications.
  - .1 Sealant type: Silicone, one part.
- .4 Perimeters of interior door, windows, edges of drywall and other frames and surfaces.
  - .1 Sealant type: Acrylic latex or Silicone, one part.
- .5 Perimeter of plumbing fixtures, countertop backsplash at wall, window sills, FRP panels, ceramic tile.
  - .1 Sealant type: Silicone, mildew resistant.
- .6 Building envelope applications (vapour retarder, vapour barrier, vapour barrier/wall openings and vapour retarder/ wall openings, etc):
  - .1 Sealant type: Acoustical sealant.
- .7 Interior partitions acoustic applications:
  - .1 Sealant type: Acoustical sealant.
- .8 Interior masonry: walls to floor, wall to steel
  - .1 Sealant type: Silicone, one part.
- .9 Perimeter and annular space around all interior non rated penetrations in floors, walls, ceilings, partitions etc.,:
  - .1 Sealant type: Acoustical sealant.
- .10 Perimeter all interior walls, ceilings, partitions etc...
  - .1 Sealant type: Silicone, one part.
- .11 Interior concrete control joints and saw cuts.
  - .1 Sealant type: Epoxy, flexible.
- .12 Perimeter of interior concrete slab. – Radon gas seal.
  - .1 Sealant type: Polyurethane, self-levelling.
- .13 Top of masonry walls; 25 mm space between top of non-load bearing wall and structural elements.
  - .1 Non-exposed: Acoustical sealant.
  - .2 Exposed: Silicone, one part.

- .14 Perimeter all countertops, joints between millwork and walls.
  - .1 Sealant type: Silicone, one part.
- .15 Perimeter all stairs and stringers.
  - .1 Sealant type: Silicone, one part.
- .16 Perimeter of cover plates, access doors and other similar items.
  - .1 Sealant type: Silicone, one part.
- .17 For locations not included in this schedule, consult with Departmental Representative for proper selection of sealants.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

#### **3.2 SURFACE PREPARATION**

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.
- .6 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .7 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
- .8 Apply bond breaker tape where required to manufacturer's instructions.
- .9 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

### **3.3 MIXING**

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

### **3.4 APPLICATION**

- .1 Apply sealant in accordance with manufacturer's written instructions.
- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant 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 Cure sealants in accordance with sealant manufacturer's instructions.
- .10 Do not cover up sealants until proper curing has taken place.

### **3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.6 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

**END OF SECTION**