## Part 1 General

### 1.1 SCOPE

.1 This Section describes the requirements for rigid insulation to be applied to concrete slabs, against perimeter foundation walls, and as isolation joints where indicated on the drawings.

### 1.2 REFERENCES

.1 National Building Code of Canada (NBC).

.2 Manitoba Building Code (MBC).

.3 American Society for Testing and Materials International (ASTM)

.1 ASTM E96/E96M-05, Standard Test Methods for Water Vapour Transmission of Materials.

.4 Canadian General Standards Board (CGSB)

.1 CGSB 71-GP-24M-77 (R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.5 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.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

### 1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Specification E3 – Shop Drawings.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Specification E3 – Shop Drawings. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

### 1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Specification D13 – Environmental Plan

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

## Part 2 Products

### 2.1 INSULATION

.1 Rigid Insulation: Styrofoam SM by Dow Chemical Canada Inc., or approved equal, expanded closed cell polystyrene to CAN/CGSB-51.20 Type 4.

.2 Provide in total thickness and depth as shown on the drawings.

### 2.2 ADHESIVE

.1 Adhesive (for polystyrene): to CGSB 71-GP-24, compatible with specified insulation.

## Part 3 Execution

### 3.1 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.

### 3.2 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 75 mm from heat emitting devices.

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

.7 Do not enclose insulation until it has been inspected and approved by Contract Administrator.

### 3.3 EXAMINATION

.1 Examine substrates and immediately inform Contract Administrator in writing of defects.

.2 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.

**3.4 RIGID INSULATION INSTALLATION**

.1 Apply adhesive to substrate in accordance with manufacturer's recommendations.

.2 At below grade locations on concrete walls against soil, imbed insulation boards in spots of adhesive sufficient to hold them in place until backfilled.

**3.5 CLEANING**

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## Part 1 General

### 1.1 SCOPE

.1 This section describes the requirements for blanket insulation applied to inside walls and attic space.

### 1.2 RELATED SECTIONS

.1 Section 07 26 00 - Vapour retarders.

### 1.3 REFERENCES

.1 National Building Code of Canada (NBC).

.2 Manitoba Building Code (MBC).

.3 American Society for Testing and Materials International (ASTM)

.1 ASTM C553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 ASTM C665-01e1, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.4 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.5 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

### 1.4 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Specification E3 – Shop Drawings.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

### 1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Specification D13 – Environmental Protection Plan.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

## Part 2 Products

### 2.1 INSULATION

.1 Batt and blanket mineral fibre: to ASTM C665 and CAN/ULC S702.

.1 Type: Owens Corning Pink Fibre glass or Approved equal in accordance with B7.

.2 Thickness: 140 mm providing total insulation value RSI 3.52 (R20), or to fill cavities as indicated on drawings.

.3 Thickness: providing total insulation value RSI 7.04 (R40) to attic space.

### 2.2 ACCESSORIES

.1 Type: as recommended by manufacturer.

## Part 3 Execution

### 3.1 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.

### 3.2 INSULATION INSTALLATION

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.

.2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.3 Do not compress insulation to fit into spaces.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of chimneys and Type B vents.

.5 Do not enclose insulation until it has been inspected and approved by Contract Administrator.

### 3.3 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## Part 1 General

### 1.1 RELATED SECTIONS

.1 Section 07 21 16 –Blanket Insulation.

### 1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM D412-98a (2002) e1, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

### 1.3 SUBMITTALS

.1 Provide submittals in accordance with Specification E3 – Shop Drawings.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include:

.1 Product characteristics.

.2 Performance criteria.

.3 Limitations.

.3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

.4 Quality assurance submittals:

.1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.2 Instructions: submit manufacturer's installation instructions and comply with written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

### 1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Specification D13 – Environmental Protection Plan.

## Part 2 PRODUCTS

### 2.1 SHEET VAPOUR BARRIER

.1 Polyethylene film: to CAN/CGSB-51.34, 0.15 mm (6 mil) thick for under concrete slab-on-grade applications and as a vapour barrier in wood framed construction.

### 2.2 ACCESSORIES

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape, cloth fabric duct tape type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.

.2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer.

.3 Staples: minimum 6 mm leg.

.4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

## Part 3 EXECUTION

### 3.1 INSTALLATION

.1 Sheet Vapour Barrier:

.1 Ensure services are installed and inspected prior to installation of retarder.

.2 Install sheet vapour retarder on warm side of exterior wall assemblies to form continuous retarder.

.3 Use sheets of largest practical size to minimize joints.

.4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

### 3.2 PERIMETER SEALS

.1 Seal perimeter of sheet vapour barrier as follows:

.1 Apply continuous bead of sealant to substrate at perimeter of sheets.

.2 Lap sheet over sealant and press into sealant bead.

.3 Install staples through lapped sheets at sealant bead into wood substrate.

.4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

## 3.3 LAP JOINT SEALS

.1 Seal lap joints of sheet vapour barrier as follows:

.1 Attach first sheet to substrate.

.2 Apply continuous bead of sealant over solid backing at joint.

.3 Lap adjoining sheet minimum 150 mm and press into sealant bead.

.4 Install staples through lapped sheets at sealant bead into wood substrate.

.5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

## 3.4 ELECTRICAL BOXES

.1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:

.1 Install moulded box vapour barrier Wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.

.2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

## 3.5 CLEANING

.1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

## Part 1 General

### 1.1 SCOPE

.1 The scope of this section generally includes but not limited to:

- .1 Underlayment.
- .2 Roof panel clip system.
- .3 Roof panel.
- .4 Accessories including associated flashings, closures, sealants.

### 1.2 RELATED SECTIONS

.1 Specification E3 – Shop Drawings

.2 Specification D13 – Environmental Protection Plan

### 1.3 REFERENCES

.1 National Building Code of Canada (NBC).

.2 Manitoba Building Code (MBC).

.3 Design of cladding system in accordance to the latest edition of:

- .1 CSA-S136 for the design of Cold Formed Steel Structural Members
- .2 Canadian Sheet Steel Building Institute Standards 10M and 20M
- .3 National Building Code of Canada.

.4 The Aluminum Association Inc. (AA)

- .1 Aluminum Sheet Metal Work in Building Construction-2000.
- .2 AA DAF45-97, Designation System for Aluminum Finishes.

.5 American Society for Testing and Materials (ASTM International)

- .1 ASTM A606-01, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
- .2 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM A792/A792M-02, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .4 ASTM D523-89 (1999), Standard Test Method for Specular Gloss.
- .5 ASTM D822-01, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.6 Canadian Roofing Contractors Association (CRCA)

- .1 Roofing Specifications Manual 1997.

.7 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13-M87, sealing compound, one component, silicone base, chemical curing.

.2 CAN/CGSB-19.24-M90, sealing compound, multi-component, chemical curing.

.3 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.

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

.5 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

.8 Canadian Standards Association (CSA International)

.1 CSA A123.3-98, Asphalt Saturated Organic Roofing Felt.

.2 CSA B111-1974 (R1998), Wire Nails, Spikes and Staples.

**1.5 DESIGN REQUIREMENTS**

.1 Design roof system to resist

.1 Snow loads and snow build-up and rain load, expected in this geographical region NBCC climatic data, 50 year probability.

.2 Wind loads, positive and negative, expected in this geographical region NBCC climatic data, 50 year probability.

.3 Dead load of roof system.

.2 Deflection of the roof system is not to exceed $1/180^{th}$ of the span for the specified live loading.

.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and night-time sky heat loss.

.1 Temperature Change (Range): 20 deg C, ambient; 40 deg C, material surfaces

**1.4 SAMPLES**

.1 Submit samples of standard coloured metal roof for review by the contract Administrator, prior to fabrication.

**1.5 SHOP DRAWINGS**

.1 Submit shop drawings in accordance with Section E3.

.1 Indicate arrangement of pre-finished Roof Sheet, including joints, types and locations of supports, fasteners, flashing, gutters, mitres, and all metal components related to the roof installation. Include for underlayment as part of the roof system.

.2 Drawings shall be signed and sealed by a Contract Administrator, attesting to the ability of the metal panel's assembly to withstand the specified loads.

**1.6 PRODUCT DELIVERY, HANDLING AND STORAGE**

.1 Store components and materials in accordance with panel manufacturer's recommendations and protect from elements.

.2 Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

**1.7 GUARANTEE**

.1 For the work in this section, warranty by installer against defects or deficiencies in materials or workmanship shall be for a period of one year from date of substantial completion.

## Part 2 Products

**2.1 ROOF SYSTEM COMPONENTS**

.1 Roof System: Tradition100-4 on Solid Substrate by Vicwest.

.1 Underlayment: Membrane shall be Ice and Water Shield by W.R. Grace or an approved equal.

.2 Clip System

.1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.

.2 Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.

.3 Prefinished Roof Sheet, exposed to exterior.

.1 Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.

.2 Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76 mm (0.030").

.4 Snap Cap

.1 Provide 25 mm high snap caps for full length of the roof panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm (0.024"). Finish and colour to match roof sheet.

**2.2 PANEL FINISHES**

.1 Coating: Prepainted with WeatherX™ on interior face

**2.3 COLOUR**

.1 Colour to be selected from the manufacturer's standard colour range.

**2.4 ACCESSORIES**

.1 Flashing: Formed from same materials as the roof sheet. Custom fabricated to suit architectural details, as required.

.2 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.

.3 Sealants: In accordance with manufacturer's recommendation and Section 07 92 00.

**2.5 FABRICATION**

.1 Fabricate roof components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.

.2 Fabricate all components of the system in the factory, ready for field installation.

.3 Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

**Part 3 Execution**

**3.1 EXAMINATION**

.1 Examine work of other Sections upon which work of this Section depends.

.2 Report all discrepancies to Contract Administrator before beginning work on the roof system.

**3.2 INSTALLATION**

.1 Roof Materials:

.1 Underlayment: Install underlayment fully adhered to solid substrate according to manufacturer's recommendations. Ensure all joints are properly lapped and sealed. Tie in with barriers on adjacent surfaces to ensure airtight construction. Provide a continuous seal around all openings in the insulated metal roof system.

.2 Clip: Attach Tradition clips using fasteners as recommended by the manufacturer, to suit the substrate.

.2 Roof Panel Installation

.1 Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.

.2 Install the snap-cap at all side laps as shown on the approved shop drawings. Mitre snap-cap as required to resist water entry.

.3 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturer's specifications and details to provide a weather-tight seal. Exposed fasteners to match colour of the roof sheet.

.4 Provide notched and formed closures, sealed against weather penetration, at changes in pitch, and at ridges and eaves, where required.

.5 Install all companion flashing {gutters}, {ventilators} as shown on the shop drawings. Use concealed fasteners when possible. Exposed fasteners to match colour of roof sheet.

**3.3 CLEAN-UP**

.1 Clean exposed panel surfaces in accordance with manufacturer's instructions.

.2 Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Architect and only where appearance after touch-up is acceptable to Architect.

.3 Replace damaged panels and components that, in opinion of the Architect, cannot be satisfactorily repaired.

**END OF SECTION**

## Part 1 General

### 1.1 SCOPE

.1 The scope of this section generally includes but is not limited to:

.1 Pre finished metal siding and trim.

.2 Metal flashing at roofing perimeter and wall penetrations, openings.

### 1.2 RELATED SECTIONS

.1 Specification E3 – Shop Drawings

.2 Specification D13 – Environmental Protection Plan

.3 Section 07 92 10 – Joint Sealing.

### 1.3 REFERENCES

.1 National Building Code of Canada (NBC).

.2 Manitoba Building Code (MBC).

.3 The Aluminum Association Inc. (AA)

.1 Aluminum Sheet Metal Work in Building Construction-2000.

.2 AA DAF45-97, Designation System for Aluminum Finishes.

.4 American Society for Testing and Materials (ASTM International)

.1 ASTM A606-01, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

.2 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM A792/A792M-02, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.4 ASTM D523-89 (1999), Standard Test Method for Specular Gloss.

.5 ASTM D822-01, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.5 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

.6 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13-M87, sealing compound, one component, silicone base, chemical curing.

.2 CAN/CGSB-19.24-M90, sealing compound, multi-component, chemical curing.

.3 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.

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

.5 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

.7 Canadian Standards Association (CSA International)

.1 CSA A123.3-98, Asphalt Saturated Organic Roofing Felt.

.2 CSA B111-1974 (R1998), Wire Nails, Spikes and Staples.

**1.4 SAMPLES**

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

**1.5 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Specification D13 – Environmental Protection Plan

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Ensure emptied containers are sealed and stored safely for disposal away from children.

.6 Divert unused metal materials from landfill to metal recycling facility as approved by Contract Administrator.

.7 Unused paint and sealant material must be disposed of at an official hazardous material collections site as approved by Contract Administrator.

.8 Unused paint and sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.9 Fold up metal banding, flatten and place in designated area for recycling.

**Part 2 Products**

**2.1 PRE FINISHED METAL SIDING**

.1 Zinc coated steel sheet: commercial quality to ASTM A653/A653M, grade 50, with Z275 designation zinc coating.

.2 Exterior side prefinished with a siliconized polyester coating system, oven baked, dry film thickness 0.7 to 0.9 mils.

.3 Interior side protected by wash coat of primer.

.4 Product: VicWest or approved equal.

.5 Profile: 24 gauge CL 6025-SR, 36 mm deep, 900 mm wide.

.6 Factory applied sealant in interlocking side lap joints to provide weathertight installation.

**2.2 SHEET METAL MATERIALS**

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

.2 Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality.

**2.3 PREFINISHED STEEL SHEET**

.1 Prefinished steel with factory applied polyvinylidene fluoride.

.1 Class F1S.
.2 Colour selected by Contract Administrator from manufacturer's standard range.
.3 Specular gloss: 30 units +/- in accordance with ASTM D523.
.4 Coating thickness: not less than 22 micrometres.

**2.4 FINISHED ALUMINUM SHEET**

.1 Finish: factory applied coating to CAN/CGSB-93.1 supplemented and amended as follows:

.1 Type 1.
.2 Class F1S.
.3 Colour selected by Contract Administrator from manufacturer's standard range.

.2 Thickness specified for prefinished aluminum sheet applies to base metal.

**2.5 ACCESSORIES**

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.

.4 Sealants: Multi-component conforming to CGSB Specification CAN/CGSB-19.24, or single component conforming to CGSB Specification CAN/CGSB-19.13.

.1 Acceptable products:
.1 Dymeric by Tremco (Canada) Limited.
.2 Proglaze by Tremco (Canada) Ltd.
.3 1200 Sealant by CGE Canada Ltd.
.4 795 Sealant by Dow Corning Canada.
.5 Or Approved equal in accordance with B7.

.5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness, same as sheet metal being secured.

.6 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.

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

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

**2.6 FABRICATION**

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details.

.2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AA-Aluminum Sheet Metal Work in Building Construction.

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

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

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

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

**2.7 METAL FLASHINGS**

.1 Form flashings, copings and fascias to profiles indicated of 0.60mm thick prefinished aluminum or prefinished galvanized steel.

**2.8 CAP FLASHINGS**

.1 Form metal cap flashing of 0.60 mm thick sheet metal as detailed and in accordance with CRCA FL series details. Provide slotted fixing holes and plastic washer fasteners.

**2.9 EAVES TROUGHS**

.1 Formed from prefinished 22 gauge metal.

.2 Secure to building with metal strap.

## Part 3 Execution

**3.1 INSTALLATION**

.1 Provide and install pre-finished metal siding materials, flashings at openings, and trim shapes as indicated in approved shop drawings.

.2 Avoid end laps in vertical sections.

.3 Install sheet metal work in accordance with CRCA FL series details.

.4 Use concealed fastenings except where approved before installation.

.5 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.

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

.7 Lock end joints and caulk with sealant.

.8 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.9 Insert metal flashing under cap flashing to form weather tight junction.

.10 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.

.11 Caulk flashing at cap flashing with sealant.

**3.2 EAVES TROUGHS AND DOWNPIPES**

.1 Install eaves troughs and secure to building at 1220 mm on centre with galvanized metal straps.

.2 Slope eaves troughs to down pipes.

.3 Seal joints watertight.

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

.1 National Building Code of Canada (NBC).

.2 Manitoba Building Code (MBC).

.3 Underwriter's Laboratories of Canada (ULC)

.1 ULC-S115-1995, Fire Tests of Firestop Systems.

### 1.2 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Specification E3 – Shop Drawings

.2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation.

.3 Construction details should accurately reflect actual job conditions.

### 1.3 PRODUCT DATA

.1 Submit product data in accordance with Specification E3 – Shop Drawings

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

### 1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Specification D13 – Environmental Protection Plan.

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

## Part 2 Products

### 2.1 MATERIALS

.1 Firestopping and smoke seal systems: in accordance with ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended.

.2 Firestop system rating: 1 hour FT rating for horizontal fire separations and 1 hour F rating for vertical fire separations.

.2 Service penetration assemblies: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.

.3 Service penetration firestop components: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.13 and ULC Guide No.40 U19.15 under the Label Service of ULC.

.4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

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

.9 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.

.10 Sealants for vertical joints: non-sagging.

## Part 3 Execution

### 3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

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

### 3.2 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.2 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.

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

.4 Tool or trowel exposed surfaces to a neat finish.

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

**3.3 INSPECTION**

.1 Notify Contract Administrator when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

**3.4 SCHEDULE**

.1 Firestop and smoke seal at:

.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Edge of floor slabs at curtain wall and precast concrete panels.

.3 Top of fire-resistance rated masonry and gypsum board partitions.

.4 Intersection of fire-resistance rated masonry and gypsum board partitions.

.5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.7 Openings and sleeves installed for future use through fire separations.

.8 Around mechanical and electrical assemblies penetrating fire separations.

.9 Rigid ducts: greater than 129 $cm^2$: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

**3.5 CLEAN UP**

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

**END OF SECTION**

## Part 1 General

### 1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

### 1.2 RELATED SECTIONS

.1 Specification E3 – Shop Drawings

.2 Section 01 45 00 - Quality Control.

.3 Specification D13 – Environmental Plan

.4 Section 08 11 14 – Metal Doors and Frames.

.5 Section 08 50 00 – Windows and Glazing.

.6 Section 13 27 00 – Prefabricated Kiosk Building.

### 1.3 REFERENCES

.1 National Building Code of Canada (NBC).

.2 Manitoba Building Code (MBC).

.3 American Society for Testing and Materials International, (ASTM)

.1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.4 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No.1).

.2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB-19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound, Type 2, Class B.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

### 1.4 SUBMITTALS

.1 Submit product data in accordance with Specification E3 – Shop Drawings

.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 Submit samples in accordance with Specification E3 – Shop Drawings

.4 Submit duplicate samples of each type of material and colour.

.5 Cured samples of exposed sealants for each color where required to match adjacent material.

.6 Submit manufacturer's instructions in accordance with Specification E3 – Shop Drawings

.7 Instructions to include installation instructions for each product used.

**1.5 QUALITY ASSURANCE**

.1 Carry out the supply and installation of sealants and caulking work by recognized Specialist Applicators having at least five years of proven satisfactory experience and having skilled workmen thoroughly trained and competent in all phases of caulking work.

**1.6 DELIVERY, STORAGE, AND HANDLING**

.1 Deliver, handle, store and protect materials in accordance with Section E4

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

.3 Store materials in dry location in such manner that no damage will be done to materials or building.

**1.7 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate waste materials for reuse and recycling in accordance with Specification D13 – Environmental Protection Plan.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.7 Divert unused joint sealing material from landfill to an approved, official hazardous material collections site.

.8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.9 Fold up metal banding, flatten, and place in designated area for recycling.

## 1.8 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## 1.9 ENVIRONMENTAL REQUIREMENTS

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

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

## 1.10 WARRANTY

.1 Provide written warranty covering the work of this Section for a period of two years from the date of Substantial Completion as per the Project Agreement.

.2 Defective work shall include but not be restricted to leakage, cracking, crumbling, melting, running, loss of adhesion, loss of cohesion, staining of adjoining or adjacent surfaces or work.

## Part 2 Products

### 2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks 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.

.3 Where sealants are qualified with primers use only these primers.

### 2.2 SEALANT MATERIAL DESIGNATIONS

.1 Sealants - Type A

.1 Multi-component sealants to meet CGSB Specification CAN/CGSB-19.24, (2-part urethane) or single component sealant to meet CGSB Specification CAN/CGSB-19.13, (silicone) to be used for:

.1 Exterior joints around perimeters of metal door frames including thresholds and sills.

.2 Exterior joints around perimeters of louvre frames and duct penetrations.

.3 Exterior perimeter of conduit, wire and pipe penetrations.

.4 Exterior control joints.

.5 Roof flashings.

.2 Use one of the following sealants:

.1 Dymeric by Tremco (Canada) Limited.

.2 1200 Sealant by CGE Canada Ltd.

.3 795 Sealant by Dow Corning Canada.

.2 Sealants - Type B

.1 Acrylic solvent release, one part sealant, to meet CGSB Specification 19-GP-5M, to be used for all other locations where caulking beads remain exposed:

.1 Interior perimeters of door and window frames, louvre openings, service penetrations and ducts.

.2 Interior movement joints in exterior masonry walls

.3 Use one of the following sealants:

.1 Mono by Tremco (Canada) Limited.

.2 Acryflex by Sternson Ltd.

.3 Parr-Crylic by Parr Sealants of Canada Ltd.

.4 PR12-100 Vinyl Acrylic by PRC Canada Ltd.

.4 Silicone Sealant – Type C

.1 Apply clear, mildew resistant silicone sealant at perimeter of backsplashes, at millwork mounted against walls, at washroom vanities, and around plumbing fixtures at floor and wall surfaces.

.2 Use one of the following sealants:

.1 Tremsil 200 by Tremco (Canada) Ltd.

.2 DAP 3.0

.5 Primers

.1 To be of a type recommended by sealant manufacturer for the appropriate sealant and corresponding substrate.

.6 Preformed Compressible and Non-Compressible back-up materials.

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.

.1 Extruded open closed cell foam backer rod.

.2 Size: oversize 30 to 50%.

.2 Neoprene or Butyl Rubber.

.1 Round solid rod, Shore a hardness 70.

.3 High Density Foam.

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/$m^3$ density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond Breaker Tape.

.1 Polyethylene bond breaker tape which will not bond to sealant.

**2.3 COLOURS**

.1 Colours of sealant, shall match the predominant material to which sealant is applied.

**2.4 JOINT CLEANER**

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

.2 Primer: as recommended by manufacturer.

**Part 3 Execution**

**3.1 PROTECTION**

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

**3.2 SURFACE PREPARATION**

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

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

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

.4 Ensure joint surfaces are dry and frost free.

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

**3.3 PRIMING**

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

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

**3.4 BACKUP MATERIAL**

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

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

**3.5 MIXING**

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

**3.6 APPLICATION**

.1 Sealant.

.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.

.2 Curing.

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

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

.3 Cleanup.

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

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

.3 Remove masking tape after initial set of sealant.

**END OF SECTION**