Part 1 General

1.1 REFERENCES

.1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)

.2 Green Seal Environmental Standards

.1 Standard GC-03-93, Anti-Corrosive Paints.

.2 Standard GS-11-97, Architectural Paints.

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

.1 Material Safety Data Sheets (MSDS).

.4 South Coast Air Quality Management District (SCAQMD), California State SCAQMD Rule 1113-06, Architectural Coatings.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S101-04, 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-S705.1-01, 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.

1.2 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies WHMIS MSDS - Material Safety Data Sheets.

.3 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.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 and cleaning procedures.

1.3 QUALITY ASSURANCE

.1 Applicators to conform to CUFCA Quality Assurance Program.

.2 Qualifications:

.1 Installer: person specializing in sprayed insulation installations with 5 years experience and approved by manufacturer.

.2 Manufacturer: company with minimum 5 years experience in producing of material used for Work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in Work.

.3 Mock-up:

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up 10 lineal metres minimum, of sprayed insulation including one inside corner and one outside corner, door, window openings.

.3 Mock-up may be part of finished Work.

.4 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with sprayed insulation Work.

.4 Health and Safety Requirements: worker protection:

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:

.2 Workers must wear protective clothing and equipment in accordance with manufacturer’s instructions when applying foam insulation.

.3 Workers must not eat, drink or smoke while applying foam insulation.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.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.

.3 Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

.4 Store materials in a dry area protected from precipitation, freezing and overheating, at temperatures not lower than 60 F (16 C) or above 90 F (32 C).

.5 Protect materials during handling and application to prevent damage and contamination.

1.5 SITE CONDITIONS

.1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.

.2 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.

.3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

.4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

.5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

Part 2 Products

2.1 MATERIALS

.1 Insulation: low pressure spray polyurethane foam for use around perimeter openings of window and door frames and in corner stud locations to ASTM C 1620 and AAMA 812.

.1 Acceptable Product: DOW Great Stuff Pro – Window and door or approved equal in accordance with B7.

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.

.1 Maximum VOC limit 100 g/l to SCAQMD Rule 1113.

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 APPLICATION

.1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions.

.2 Use Low VOC primer where recommended by manufacturer.

.3 Apply sprayed foam insulation in thickness as indicated.

.4 Spray foam insulation to be covered with Gypsum board after installation.

3.3 CLEANING

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

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Aluminum Association (AA).

.1 AA-DAF-45-R03, Designation System for Aluminum Finishes.

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

.1 ASTM A653/A653M-02a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B136 - Standard Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum.

.3 ASTM B244 - Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments.

.4 ASTM C834 - Standard Specification for Latex Sealants.

.5 ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

.6 ASTM C1186 - Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.

.7 ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

.8 ASTM E96 - Test Methods for Water Vapor Transmission of Materials.

.9 ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

.10 ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

.3 American National Standards Institute (ANSI)

.1 ANSI A135.6-2006, Hardboard Siding.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 1-GP-71 Amendment 13-1995, Methods of Testing Paints and Pigments (including Amendments 1 to 12 and Supplement No. 1).

.2 CAN/CGSB 11.5 M-87: Hardboard, Precoated, Factory Finished, for Exterior Cladding.

.5 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act (CEPA), 1999.

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

.1 Material Safety Data Sheets (MSDS).

.7 National Research Council (NRC).

.8 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act (TDGA), 1992.

.9 AATCC127 - Water Resistance: Hydrostatic Pressure Test.

.10 TAPPI - T460 - Air Resistance of Paper (Gurley Method).

1.2 DESIGN REQUIREMENTS

.1 Design composite building panel wall to provide for thermal movement of component materials caused by ambient temperature range of 80 degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

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

.3 Design members to withstand dead load and wind loads as calculated in accordance with NBC and applicable Municipal/Territorial regulations.

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

.5 Maintain following installation tolerances:

.1 Maximum variation from plane or location shown on approved shop drawings: 10 mm/m of length and up to 20 mm/100 m maximum.

.2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.

1.3 SHOP DRAWINGS

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

.2 Indicate dimensions, wall openings, head, jamb, sill and mullion detail, materials and finish, anchor details, compliance with design criteria and requirements of related Work.

.3 Shop drawings to be reviewed and sealed by a Professional Structural Engineer in the Province of Manitoba.

1.4 SUBMITTALS

.1 Product Data: Manufacturer's data sheets, and maintenance and installation instructions.

1.5 SAMPLES

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

.2 Submit full size sample of wall system, representative of materials, finishes and colours.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Store products in manufacturer's unopened packaging until ready for installation.

.2 Store flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

1.7 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 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 QUALITY ASSURANCE

.1 Installer Qualifications: Minimum of 2 years experience with installation of similar products and listed by Manufacturer.

.2 Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

.1 Finish areas designated by Contract Administrator.

.2 Do not proceed with remaining Work until &by Contract Administrator.

.3 Mock-up may remain as part of finished Work.

1.9 WARRANTY

.1 For Work of this section, base warranty is extended to:

.1 30 year limited product warranty against manufacturing defects.

.2 Workmanship Warranty: Application limited warranty for 2 years.

.3 Manufacturer finished colour: 15 year paint and labour warranty.

Part 2 Products

2.1 CEMENTITIOUS PANEL SYSTEM

.1 Cementitious Siding Panels: Hardie HZ5 Reveal Panel as manufactured by James Hardie Building Products, or approved equivalent in accordance with B7.

.1 11mm thickness.

.2 Smooth finish with Hardie Color Plus finish.

.3 To be installed with least amount of joints as possible. Use full pieces.

.4 Finish: to be from standard colour range selected by Contract Administrator.

.2 Code Compliance Requirement for Siding Materials:

.1 Fiber-cement siding, complies with ASTM C 1186 Type A Grade II.

.2 Fiber-cement siding, complies with ASTM E 136 as a noncombustible material.

.3 Fiber-cement siding, complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.

.4 Fiber-cement siding, complies with ASTM E 119 1 hour and 2 hour fire resistive assemblies listed with Warnock Hersey.

.5 Fiber-cement siding, tested to ASTM E330 for Transverse Loads.

.6 Intertek Warnock Hersey Product Listing.

.3 Fasteners: For attaching Hardie Reveal Panel direct to Z-girts provide the following:

.1 Colour matched TW-S 300 series austenitic stainless steel cladding fasteners by SFS intec Inc.

.1 Corrosion resistant when used for fastening into concrete block.

.2 Compatible with James Hardie Board.

.3 10-12 / 0.189" thread diameter by lengths required with T20W Torx Pan Head.

Part 3 Execution

3.1 EXAMINATION

.1 Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

.1 Install materials in strict accordance with manufacturer's installation instructions.

.2 Place fasteners no closer than 3/4 inch (19mm) from panel edges and 2 inches (51 mm) from panel corners.

.3 Use fasteners as specified by manufacturer.

.4 Install a kickout flashing to deflect water away from the siding at the roof intersection.

.5 Install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then install the kickout.

.6 Allow minimum vertical clearance between the bottom edge of siding and any other material in strict accordance with the manufacturer's installation instructions and as determined by James Hardie Zone.

.7 Maintain clearance between siding and adjacent finished grade.

.8 Specific framing and fastener requirements - refer to the applicable building code compliance reports.

3.4 FINISHING

.1 Field cut edges shall be coated during the installation process (without delay) using an exterior grade primer/sealer that is compatible with the type of paint to used on project.

.2 Provide Clear Anodized for shiny mill finish metallic aesthetic of Reveal Trims.

3.5 PROTECTION

.1 Protect installed products until completion of project.

.2 Touch-up, repair or replace damaged products before Substantial Completion.

3.6 ACCESSORIES

.1 Install all head and sill flashings, edge trim, cap pieces and fillers, and other trim as required for complete installation, including trim around wall penetrations.

.2 Control/expansion joints as per manufacturer’s requirements.

3.7 CLEANING

.1 Wash down exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.

END OF SECTION

Part 1 General

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 44 56 – Cementitious Panels

.3 Section 07 62 00 – Sheet Metal Flashing and Trim

.4 Section 08 11 14 – Metal Door and Frames

.5 Section 08 50 50 – Windows

1.2 References

.1 The Aluminum Association Inc. (AA)

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

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

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

.1 ASTM A591/A591M-98, Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.

.2 ASTM A606-01, 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-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) 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.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

.4 Canadian General Standards Board (CGSB)

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

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

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

.5 Canadian Standards Association (CSA International)

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

.2 CSA-A440-00/A440.1-00 - A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.

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

1.3 Samples

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

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

Part 2 Products

2.1 Sheet Metal Materials

.1 Where concealed: 0.76mm thick (gauge 22) Zinc coated (galvanized) steel sheet: commercial quality to ASTM A 653/A 653M, with Z275 (G90) designation zinc coating.

.2 Where exposed: 0.76mm thick (gauge 22) Prefinished steel with factory-applied silicone modified polyester.

.1 Acceptable Material: VicWest / Valspar WeatherX or approved equivalent in accordance with B7.

.2 Colour as selected by Contract Administrator from manufacturer's standard range.

.3 Coating thickness: not less than 20 micrometres.

.4 Properties:

.1 Specular Gloss at 60° ASTM D 5232: 20 to 80

.2 Pencil Hardness ASTM D 3363: F to 2H

.3 T-Bend ASTM D 41455: 2T to 4T3 with no loss of adhesion.

.4 Cross Hatch Adhesion ASTM D 3359: no loss of adhesion.

.5 Reverse Impact ASTM D 27945: Galvalume® or HDG: 3x3 metal thickness inch-pounds, no loss of adhesion Aluminum: 1.5x metal thickness inch-pounds, no loss of adhesion.

.6 Humidity Resistance□100% RH 1,000 Hours ASTM D 2247 100% RH 2,000 Hours ASTM D 2247: Galvalume® or HDG: No field blisters Aluminum: No field blisters.

.7 Salt Spray Resistance 1,000 Hours ASTM B 117 2,000 Hours ASTM B 117: Galvalume® or HDG: Creep from scribe ≤ 1/8 inch (3mm), none or few #8 blisters Aluminum: Creep from scribe ≤ 1/8 inch (3mm), few #8 blisters.

.8 South Florida Exposure ASTM D 2244□ASTM D 6591: Color: No more than 5ΔE Hunter units at 90 □ vertical angle and 6ΔE nonvertical at 20 yrs Chalk: Rating no less that 8 at 90 □ angle and 7 at non vertical angle at 20 yrs□Film Integrity: 25 years, no blisters, peeling or cracking

.9 Water Immersion 100° F 168 Hours ASTM D 870: No field blisters with minimal color change

.10 Dew Cycle Weatherometer 200 Total Hours ASTM D 3361: Color: No More than 5ΔE hunter units Chalk: Rating no less than 8

.11 Abrasion Resistance: ASTM D 968: Total sand = 35 ± 5 liters

2.2 Accessories

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32 asphalt laminated 3.6 to 4.5 kg kraft paper No. 15 perforated asphalt felt to CSA A123.3.

.4 Sealants: Sections 07 92 00 – Joint Sealing.

.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.

2.3 Fabrication

.1 Fabricate metal flashings and other sheet metal Work in accordance with applicable CRCA 'FL' series details and as shown on the drawings.

.2 Form pieces in 3000 mm maximum lengths. Make allowance for expansion at joints.

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

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

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

2.4 Metal Flashings

.1 Form flashings, copings and fascias to profiles indicated of .792mm thick (gauge 22) prefinished steel.

2.5 Reglet Flashing

.1 Form recessed surface mounted reglet metal cap flashing of .51 mm thick, 4.88 kg/m2 copper sheet metal to be built-in masonry Work for base flashings as detailed in accordance with CRCA FL series details good practice. Provide slotted fixing holes and steel/plastic washer fasteners.

Part 3 Excecution

3.1 Installation

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

.2 Use concealed fastenings except where approved before installation.

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

.4 Counter flash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock standing seams forming tight fit over hook strips.

.5 Lock end joints and caulk with sealant.

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

.7 Insert metal flashing into reglets under cap flashing to form weather tight junction.

.8 Caulk flashing at reglet cap flashing with sealant.

3.2 General Flashing

.1 Install general flashing and trim throughout as indicated on the drawings and in the specifications documents.

.1 22ga. Galvanized material for concealed conditions.

.2 22ga. Prefinished material for exposed conditions. Colour to match adjacent materials and to be reviewed and approved by Contract Administrator.

END OF SECTION

Part 1 General

1.1 Related Work

.1 Fire stopping and smoke seals within mechanical assemblies (i.e inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Mechanical Division and Division 26 00 00 respectively.

1.2 References

.1 Underwriters Laboratories of Canada (ULC)

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

.2 ASTM E 2174-04, Standard Practice for on-site inspection of installed fire stop.

1.3 Samples

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

.2 Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.

1.4 Shop Drawings

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

.2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

1.5 Product Data

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

.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.

1.6 Waste Management and Disposal

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 Materials

.1 Fire stopping 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.

.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 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.

3.5 Schedule

.1 Firestop and smoke seal at:

.1 All new penetrations through fire-resistance rated gypsum board partitions and walls.

.1 Mechanical / Electrical Room M05 with fuel-fired equipment.

.1 1hr. rated requirement.

.2 Around mechanical and electrical assemblies penetrating fire separations.

.3 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.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

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

1.2 REFERENCES

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

- .1 ASTM C 510 - Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.
- .2 ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
- .3 ASTM C 794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
- .4 ASTM C 834 - Standard Specification for Latex Sealants.
- .5 ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- .6 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.
- .7 ASTM C 1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
- .8 ASTM C 1193 - Standard Guide for Use of Joint Sealants.
- .9 ASTM C 1247 - Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
- .10 ASTM C 1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants.
- .11 ASTM C 1311 - Standard Specification for Solvent Release Sealants.
- .12 ASTM D 2203 - Standard Test Method for Staining from Sealants.

.2 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.

.3 Department of Justice Canada (Jus)

- .1 Canadian Environmental Protection Act, 1999 (CEPA).

.4 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

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

.1 Material Safety Data Sheets (MSDS).

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 SUBMITTALS

.1 ALL SUBMITTALS MUST BE PROVIDED PRIOR TO IMPLEMENTING THE CAULKING ENSURING PERFORMANCE PRIOR TO APPLICATION.

.2 Submit product data, samples and manufacturers instructions in accordance with Section 01 33 00 - Submittal Procedures.

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

.3 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.

.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.

1.4 QUALITY ASSURANCE/MOCK-UP

.1 Perform Work in accordance with the following:

.1 Building Joints: ASTM C 1193.

.2 Laboratory Pre-Construction Testing:

.1 Test sealants, joint accessories, and joint substrates in accordance with the following, before starting Work of this section:

.1 Obtain samples of joint substrate products specified in other sections.

.2 Adhesion: ASTM C 794 and ASTM C 719; determine surface preparation and required primer.

.3 Compatibility: ASTM C 1087; determine materials forming joints and adjacent materials do not adversely affect sealant materials and do not affect sealant color.

.4 Staining: ASTM D 2203, ASTM C 510, or ASTM C 1248; determine sealants will not stain joint substrates.

.5 Immersion Adhesion: ASTM C 1247

.2 Pre-construction testing is not required when sealant manufacturer can furnish data acceptable to Contract Administrator based on previous testing for materials matching those of the Work.

.3 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.1 Construct mock-up to show location, size, shape and depth of joint s complete with back-up material, primer, caulking and sealant.

.2 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application.

.3 Locate where directed.

.4 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with sealant Work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

.4 Field Pre-Construction Testing: Test each elastomeric sealant and joint substrate in accordance with the following, before beginning Work of this section:

.1 Install sealants in mockups using joint preparation methods determined by laboratory pre-construction testing.

.2 Remove existing sealant, clean joint, and install new sealant using manufacturer's recommended joint preparation methods.

.3 Install field-test joints in inconspicuous location as approved by Contract Administrator.

.4 Test Method: Manufacturer's standard field adhesion test to verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.

.5 When test indicates sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

.5 Qualifications

.1 Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

.2 Applicator Qualifications:

.1 Company specializing in performing Work of this section with minimum three years documented experience, minimum three successfully completed projects of similar scope and complexity, and approved by manufacturer.

.2 Designate one individual as project foreman who shall be on site at all times during installation.

.6 Warranty: Submit signed copies of the following warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of 3 years from date of completion.

.1 Manufacturer's standard warranty covering sealant materials.

.2 Applicator's standard warranty covering workmanship.

1.5 DELIVERY, STORAGE, AND HANDLING

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

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

1.6 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.

1.7 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.

.3 Ventilate area of Work by use of approved portable supply and exhaust fans.

Part 2 Products

2.1 GENERAL

2.2 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 Where sealants are qualified with primers, use only those primers.

.3 Use all sealants only in accordance with manufacturer’s recommended applications.

.4 It remains the contractor’s full responsibility to verify compatibility of the sealant with the substrate, primers, backer rods and weather conditions, prior to installation.

.1 Manufacturer to advise on sealant compatibility to adjacent and dissimilar surfaces, i.e., window openings.

.2 Immediately bring all discrepancies or compatibility issues to the attention of the Contract Administrator.

.3 Do not use any sealant in contact with the Air-Vapour-Barrier or roofing systems without prior approval of manufacturer.

2.3 SEALANT SELECTION

.1 REFER TO ***Table 2.1 Joint Sealants*** AT THE END OF THIS SECTION FOR ACCEPTABLE PRODUCTS TO BE USED (**OR APPROVED EQUIVALENT IN ACCORDANCE WITH B7**) IN CONSTRUCTION CONDITIONS APPLICABLE TO PROJECT SPECIFICS.

.2 Exterior joints in horizontal wearing (concrete) surfaces: Polyurethane, semi-self-levelling, moisture curing, non-staining, non-bleeding, colour as selected.

- .1 ASTM C920
- .2 Single Component
- .3 Pourable
- .4 Class – Cyclic Movement - 100/50
- .5 CAN/CGSB – 19.13-M87
- .6 Acceptable Product: Vulkem 45 SSL – Tremco Sealants, or approved equivalent in accordance with B7.

.3 General exterior use: Silicone, neutral cure ultra-low modulus, moisture curing, nonstaining, nonbleeding, colour as selected.

- .1 ASTM C920
- .2 Single Component
- .3 Non-Sag
- .4 Class – Cyclic Movement - 100/50
- .5 Class ‘A’
- .6 ASTM C1248, C1382, E84
- .7 CAN/CGSB – 19.13-M87
- .8 Acceptable Product:
  - .1 Spectrem 1 – Tremco Sealants
  - .2 Momentive SCS2700 Silpruf LM
  - .3 or approved equivalent in accordance with B7.

.4 Glazing: Silicone, neutral cure, medium modulus, colour as selected.

- .1 ASTM C920
- .2 Single Component
- .3 Non-Sag
- .4 Class – Cyclic Movement - 50
- .5 Class ‘A’
- .6 ASTM C1248
- .7 CAN/CGSB – 19.13-M87
- .8 Acceptable Product:
  - .1 Spectrem 2 – Tremco Sealants
  - .2 Momentive SCS2000 Silpruf
  - .3 or approved equivalent in accordance with B7.

.5 Air-Barrier to Window air-seal sealant: Silyl-terminated polyether polymer (STPe), moisture cure, medium modulus.

.1 Compatible with Air-Barrier system.
.2 ASTM C920
.3 Single Component
.4 Non-Sag
.5 Class – Cyclic Movement - 25
.6 Class 'A'
.7 Acceptable Product:
.1 Bakor HE925 BES
.2 Tremco Spectrem 1
.3 or approved equivalent in accordance with B7.

.6 General interior use: painted gypsum, painted concrete, painted concrete block: Acrylic latex, colour as selected.

.1 Low VOC.
.2 Single Component
.3 Non-Sag
.4 Class – Cyclic Movement - 12.5
.5 Class 'A'
.6 CAN/CGSB 19-GP-14M
.7 Acceptable Product:
.1 Tremflex 834 – Tremco Sealants
.2 Tremco Dymonic FC (interior control joinery)
.3 Chemlink Novalink (interior control joinery)
.4 or approved equivalent in accordance with B7.

.7 Plumbing fixtures and general washroom / kitchen (wet-area) usage: sinks, tubs, urinals, water-closets, vanities: Silicone, acetoxy, moisture curing, with fungicide.

.1 ASTM C920
.2 Single Component
.3 Non-Sag
.4 Class – Cyclic Movement – 25
.5 Class 'A'
.6 CAN/CGSB – 19.13-M87
.7 Acceptable Product:
.1 Tremsil 200 – Tremco Sealants
.2 Momentive SCS1700 Sanitary Series
.3 or approved equivalent in accordance with B7.

.8 Acoustical Sealant: to ASTM C919: Synthetic rubber, single-component, non-skinning, non-hardening.

.1 Single Component

.2 Non-Sag

.3 Class – Cyclic Movement – N/A

.4 CAN/CGSB 19.21 M87

.5 Acceptable Product: Acoustical Sealant – Tremco Sealants, or approved equivalent in accordance with B7.

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

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 30-50 %.

.3 Acceptable product: ITP Soft Type Backer Rod, or approved equivalent in accordance with B7.

.2 Neoprene or Butyl Rubber.

.1 Round solid rod, Shore A hardness 70.

.3 High Density Foam. 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.

.10 Joint Cleaner.

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

.11 Accessories:

.1 All primers, bond breakers and other materials are to be used in accordance with the manufacturer's recommendations.

Part 3 Execution

3.1 GENERAL JOINT DESIGN

.1 The location of joint openings must permit applicator access to install joint components and to properly tool sealant.

.2 The substrate(s) for sealant adhesion must be sound and free of deleterious materials that would compromise adhesion.

.1 Window perimeters must provide minimum 6mm wide surface for sealant to bond to.

.2 At every termination detail there must be adequate access and sufficient bonding area for sealant application.

.3 For weatherproofing, a minimum depth of 6mm for the sealant to substrate bond. A minimum width of 6mm opening is necessary to ensure that sealant applied from a caulking gun will flow into the sealant joint properly

.4 For moving joints:

.1 Use joints greater than the minimum 6mm width, since wider joints can accommodate more movement than narrow joints and can also result in a greater joint spacing.

.2 Use a sealant backing or bond breaker tape to eliminate "three-sided adhesion." The sealant should bond only to the substrates that will be moving.

.3 Use a 2:1 width to depth ratio to accommodate movement. Create an "hourglass" shape for the sealant profile

.4 For a joint size larger than 25mm, the depth should be kept to about 10mm

.5 A sealant joint should not be greater in width than 50mm

.5 It is the General Contractors responsibility to ensure the correct number and spacing of joints is provided to ensure a high performance standard.

3.2 MANUFACTURER'S INSTRUCTIONS

.1 Perform all Work in strict accordance with manufacturer's instructions.

.1 Sealant materials shall be verified for compatibility with adjacent materials and intended use.

.2 Materials shall be installed in strict accordance with, and to the depth/width ratio recommended by manufacturer's instructions.

.3 Inform Contract Administrator of all discrepancies prior to proceeding with Work.

3.3 PROTECTION

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

3.4 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.

3.5 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.

3.6 BACKUP MATERIAL

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

.2 Install joint filler to achieve **correct joint depth and shape** per manufacturer's instruction, with approximately 30% compression.

3.7 MIXING

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

3.8 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.

Table 2.1 Joint Sealants

Substrate Conditions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Between Fiberglass and Pre Finished Metals or Metal Clad Trims	√	-	-	√	NI	-	√	-	√	NI	-	-	-	√	-	√
Between Fiberglass and Brick / Concrete / Tyndall Stone	√	-	-	√	NI	√	√	√	√	NI	-	-	-	√	-	√
Between Fiberglass and EIFS or Stucco	-	√	-	√	-	√	-	√	√	-	√	-	-	-	-	-
Between PVC and Pre Finished Metals or Metal Clad Trims	-	-	-	√	NI	√	-	√	√	NI	√	-	-	√	-	√
Between PVC and Brick / Concrete / Tyndall Stone	-	-	-	√	NI	√	-	√	√	NI	√	-	-	√	-	√
Between PVC and EIFS or Stucco	-	-	-	√	-	√	-	√	√	-	√	-	-	√	-	-
Between Anodized Aluminum and Pre Finished Metals or Metal Clad Trims	√	√	√	-	-	√	√	-	-	NI	√	-	√	√	√	√
Between Anodized Aluminum and Brick / Concrete / Tyndall Stone	√	√	√	-	-	√	√	-	-	NI	√	√	√	√	√	√
Between Anodized Aluminum and EIFS or Stucco	-	-	-	-	-	√	-	√	√	-	√	-	-	-	-	-
Between Stainless Steel and other Pre Finished Metals	√	√	√	-	-	√	√	-	√	NI	√	√	√	√	√	√
Between Stainless Steel and Brick / Concrete / Tyndall Stone	√	√	√	-	-	√	√	√	√	NI	√	√	√	√	√	√
Between Stainless Steel and EIFS or Stucco	-	-	-	-	-	√	-	√	√	-	√	-	-	-	-	-
Expansion Joints in Concrete	√	√	√	-	-	√	√	-	-	-	√	√	√	√	√	√
Expansion Joints in Brick	√	√	√	-	-	√	√	-	√	NI	√	√	√	√	-	√
Expansion Joints in EIFS	-	-	-	-	-	√	-	√	√	-	√	-	-	-	-	-

Products:

1. **Momentive SCS 2000**
2. **Momentive SCS 2700 LM**
3. **Momentive SCS 9000 NB**
4. **Momentive SCS 2800**
5. **Momentive SCS 1800/SWS**
6. **Tremco Spectrem 1**
7. **Tremco Spectrem 2**
8. **Tremco Spectrem 3**
9. **Tremco Spectrem 4TS**
10. **Tremco Tremsil 600**
11. **Tremco Dymonic FC**
12. **Tremco Dymonic 100**
13. **Tremco Dymeric 240 FC**
14. **Chemlink Novalink**
15. **Chemlink M-1**
16. **Chemlink Novalink MP**

Legend:

√ = Acceptable Product **or Approved Equivalent**

- = Not Acceptable

NI = Non Impact: This product have not been tested in extraordinary weather conditions. Use ONLY if no other acceptable product is available or extraordinary weather is not a threat. Consult Architect before using.

END OF SECTION