

Part 1 General

1.1 SECTION INCLUDES

- .1 Works in this section covers the supply and installation of a spray-in-place polyurethane foam insulation closed-cell as shown and indicated on the drawings. All polyurethane foam to be protected by a spray applied thermal barrier coating as specified herein.
- .2 This specification shall be read in conjunction with the attached drawings

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C1029-15, Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
- .2 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S101-07, Fire Endurance Tests of Building Construction and Materials.
 - .2 CAN/ULC S102-10, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .3 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.
 - .4 CAN/ULC S705.1-01, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
 - .5 CAN/ULC S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.

1.3 MEASUREMENT PROCEDURES

- .1 No measurement will be made under this section. The Contractor shall include in the appropriate fixed price component all labour, materials, supervision, and equipment as required to complete the work required under this Section and as shown on the Drawings.

1.4 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 in accordance with Section 01 33 00 - Submittal Procedures.

- .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.

1.5 QUALITY ASSURANCE

- .1 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.
- .2 Health and Safety Requirements: worker protection:
 - .1 Protect workers as recommended by CAN/ULC S705.2 and manufacturer's recommendations:
 - .2 Workers must wear gloves, respirators, long sleeved clothing, and eye protection when applying foam insulation.
 - .3 Workers must not eat, drink or smoke while applying foam insulation.

1.6 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.

1.7 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: spray polyurethane to CAN/ULC-S705.1.
 - .1 Air Barrier: Type II to ASTM E283.
 - .2 Long-term thermal resistance (LTTR) of a 50 mm thick specimen: Type 2: minimum RSI-2.0.
- .2 Primers: in accordance with manufacturer's recommendations for surface conditions.
- .3 Acceptable Products:
 - .1 Heatlok SOYA by Demilec
 - .1 Foam Type: Type 2
 - .2 LTTR R-Value (RSI/50 mm): 2.02
 - .3 Foam Colour: Green
 - .2 Foam-Lok by Lapolla
 - .1 Foam Type: Type 1
 - .2 LTTR R-Value (RSI/50 mm): 1.80
 - .3 Foam Colour: Orange
 - .3 CertaSpray by Certain Teed
 - .1 Foam Type: Type 1
 - .2 LTTR R-Value (RSI/50 mm): 1.80
 - .3 Foam Colour: Beige
 - .4 Polarfoam SOYA by Demilic
 - .1 Foam Type: Type 2
 - .2 LTTR R-Value (RSI/50 mm): 2.02
 - .3 Foam Colour: Peach
 - .5 Walltite ECO by BASF
 - .1 Foam Type: Type 1
 - .2 LTTR R-Value (RSI/50 mm): 1.95
 - .3 Foam Colour: Purple
- .4 Alternates: A copy of an Evaluation Report (such as the CCMC Evaluation Report) or copies of the test reports from an SCC (Standards Council of Canada) accredited testing laboratory, for each physical property, indicating that the product meets the requirements of ULC S705.1-01 shall be made available upon request.
- .5 Thermal Barrier:
 - .1 Spray applied intumescent coating which creates a thermal barrier coating designated as a protective covering for polyurethane foam plastic in Canada. Coating must meet the requirements of a thermal barrier as defined in the National Building Code of Canada when tested in accordance with UL/ULC S124-06.
 - .2 Acceptable Product:
 - .1 Flame Seal-TB-C by Flame Seal Products, Inc.

2.2 EQUIPMENT

- .1 The equipment used to spray the polyurethane foam material shall be in accordance with CAN/ULC S705.2 and the equipment manufacturer's recommendations for specific type of application.
- .2 Equipment settings are to be recorded on the Daily Work Record as required by the CAN/ULC S705.2 Installation standard.
- .3 Each proportioner unit to supply only one spray gun.

2.3 ACCESSORIES

- .1 Prime substrate when required by spray polyurethane manufacturer or the membrane manufacturer. The type of primer and the installation of the primer shall follow the requirements of the manufacturer for the surface conditions.
- .2 Air/Vapour barrier membranes, mastics, sealants, liquids complete with required primers to complete the transitions for the air barrier system.

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 suitable to accept work as outlined in this section.
- .2 Prior to commencement of work report in writing to the consultant any defects in surfaces or conditions that may adversely affect the performance of products installed under this section.
- .3 Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.

3.3 PREPARATION

- .1 Protection:
 - .1 Mask and cover adjacent areas to protect from over spray.
 - .2 Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.
 - .3 Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.
 - .4 Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.
- .2 Surface Preparation:
 - .1 Surfaces to receive foam insulation shall be clean, dry and properly fastened to ensure adhesion of the polyurethane foam to the substrate.

- .2 Ensure that all work by other trades that may penetrates through the thermal insulation is in place and complete.
- .3 Ensure that surface preparation and any primers required conform to the manufacturer's instructions.

3.4 APPLICATION

- .1 Apply insulation to clean surfaces in accordance with CAN/ULC S705.2 and manufacturer's printed instructions.
- .2 Use primer where recommended by manufacturer.
- .3 Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer and the CAN/ULC S705.2 Installation standard.
- .4 Apply in consecutive passes as recommended by manufacturer to thickness as indicated on drawings. Passes shall be not less than 15 mm and not greater than 50 mm.
- .5 Do not install spray polyurethane foam within 75 mm of heat emitting devices such as light fixtures and chimneys.
- .6 Finished surface of foam insulation to be free of voids and imbedded foreign objects.
- .7 Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed by other sections.
- .8 Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.
- .9 Apply sprayed foam insulation in thickness as indicated on Drawings.

3.5 PROTECTION

- .1 The spray polyurethane foam shall be protected from ultraviolet as per manufacturer's requirements.
- .2 The spray polyurethane foam shall be covered with an appropriate thermal barrier meeting local building codes when installed on the interior of the building.

3.6 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 DESCRIPTION

- .1 Supply labour, materials and equipment to complete the Work as shown on the Drawings and as specified herein to bridge and seal air leakage pathways and gaps through the building envelope.
- .2 Materials and installation methods of the primary vapour permeable air barrier membrane system and accessories.

1.2 REFERENCES

- .1 The following standards are applicable to this section:
 - .1 ASTM E 2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
 - .2 ASTM E 2178: Standard Test Method for Air Permeance of Building Materials.
 - .3 ASTM E 283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .4 ASTM E 96: Water Vapour Transmission of Materials.
 - .5 ASTM C 920; Standard Specification for Elastomeric Joint Sealants.
 - .6 ASTM C 1193; Standard Guide for Use of Joint Sealants.
 - .7 ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials.
 - .8 ICC-ES AC 38: Acceptance Criteria for Water-Resistive Barriers.
 - .9 ICC-ES AC 188: Acceptance Criteria for Roof Underlayments.
 - .10 ICC-ES AC 48: Acceptance Criteria for Roof Underlayment for use in Severe Climates.
 - .11 AAMA 2400: Standard Practice for Installation of Windows with a Mounting Flange in Stud Frame Construction.
 - .12 ASTM E 2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights.
 - .13 AAMA 711-05: Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products.

1.3 SUBMITTALS

- .1 Submit documentation from an approved independent testing laboratory certifying compliance with a) the air leakage rates of the air barrier membrane assembly, including primary membrane, primer and sealants have been tested to meet ASTM E2357, b) ICC-AC 38, c) Peel adhesion to unprimed plywood and cyclic and elongation per ICC-AC 48, d) Class A flame spread index and smoke development per ASTM E 84.
- .2 Submit documentation from an approved independent testing laboratory, certifying that the air leakage and vapour permeance rates of the air barrier membrane system exceed the requirements of the National Building Code (NBC) and in accordance with ASTM E 2178 and ASTM E 2357.
 - .1 Test report submittals shall include test results on porous substrate and include sustained wind load and gust load air leakage results.
- .3 Submit manufacturers' current product data sheets for the air barrier membrane system.

1.4 QUALITY ASSURANCE

- .1 Submit document stating the applicator of the primary air barrier membranes specified in this section is authorized by the manufacturer as suitable for the execution of the Work.
- .2 Perform Work in accordance with manufacturer's written instructions and this specification.
- .3 Maintain one copy of manufacturer's written instructions on site.
- .4 Allow access to Work site by the air barrier membrane manufacturer's representatives.
- .5 Components used shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, flashings and adhesives.
- .6 Single-Source Responsibility:
 - .1 Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.
 - .2 Provide products which comply with all federal, provincial, and local regulations with regards to controlling the use of volatile organic compounds (VOC's).

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Refer to current Product MSDS for proper storage and handling.
- .2 Deliver all materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- .3 Store all roll materials on end in original packaging. Protect rolls from direct sunlight and weather until ready for use.
- .4 Store all air barrier membranes, adhesives and primers at temperatures of 5 degrees Celsius (40 degrees F) and rising.
- .5 Keep solvent away from open flame or excessive heat.
- .6 Waste Management and Disposal.
- .7 Contractor to verify compliance for Volatile Organic Compounds (VOC) limitations of products to comply with all federal, provincial, and local regulations controlling use of volatile organic compounds (VOC).

1.6 WARRANTY

- .1 Provide manufacturer's standard 12-year assembly warranty.

Part 2 Products

2.1 MATERIALS

- .1 Air barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.
- .2 Manufacturer: Henry Company Canada

2.2 MEMBRANES (BASIS-OF-DESIGN)

- .1 Self-Adhered membrane for wall transitions and terminations shall be Blueskin® SA or LT Blueskin® SA manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane which is integrally laminated to a blue engineered thermoplastic film. Membrane shall have the following physical properties:
 - .1 Membrane Thickness: 1.0 mm (0.040 inches (40 mils)).

- .2 Low temperature flexibility: -30° C to ASTM D146.
- .3 Elongation: 200% minimum to ASTM D412-modified.
- .4 Minimum Puncture Resistance 178 N to ASTM E154.
- .5 Lap Peel Strength: 4378.4 N/m to ASTM D903; 180° bend.
- .6 Auxiliary tested component of ASTM E2357 for Air Leakage of Air Barrier Assemblies.

2.3 ADHESIVE PRIMERS

- .1 Adhesive Primer for primary self-adhering water resistive air barrier membrane, self-adhering transition membrane and SBS modified bitumen membranes at all temperatures shall be Blueskin® Adhesive manufactured by Henry, a synthetic rubber based adhesive, quick setting, having the following physical properties:
 - .1 Colour: Blue.
 - .2 Weight: 0.8 kg/l.
 - .3 Solids by weight: 35%.
 - .4 Drying time (initial set): 30 minutes.
 - .5 Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.
- .2 Adhesive Primer with low VOC content for self-adhering membranes at all temperatures shall be Blueskin® LVC Adhesive manufactured by Henry-Bakor, a synthetic rubber based adhesive, quick setting, having the following physical properties:
 - .1 Colour: Blue,
 - .2 VOC: <240 g/L,
 - .3 Solids by weight: 40%,
 - .4 Drying time (initial set): 30 minutes
- .3 Primer for self-adhering membranes at temperatures above -4°C shall be Aquatac™ Primer manufactured by Henry-Bakor, a polymer emulsion based adhesive, quick setting, having the following physical properties:
 - .1 Colour: Aqua,
 - .2 Weight: 1.0 kg/l,
 - .3 Solids by weight: 53%,
 - .4 Water based, no solvent odours,
 - .5 Drying time (initial set): 30 minutes at 50% RH and 20°C.

2.4 PENETRATION & TERMINATION SEALANT

- .1 Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
 - .1 Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
 - .2 Complies with Fed. Spec. TT-S-00230C, Type II, Class A.
 - .3 Complies with ASTM C 920, Type S, Grade NS, Class 25.
 - .4 Elongation: 450 – 550%.
 - .5 Remains flexible with aging.
 - .6 Seals construction joints up to 25 mm (1 inch) wide.
 - .7 Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify that surfaces and conditions are ready to accept the Work of this section. Notify Contract Administrator in writing of any discrepancies. 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. Fill voids, gaps and spalled areas in substrate to provide an even plane. Strike masonry joints full-flush.
- .3 Curing compounds or release agents used in concrete construction must be resin based without oil, wax or pigments.

3.2 SURFACE PREPARATION

- .1 All surfaces must be sound, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane.
- .2 New concrete should be cured for a minimum of 14 days and must be dry before primer for air barrier membranes are applied.
- .3 Ensure all preparatory Work is complete prior to applying primary air barrier membrane.
- .4 Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.
- .5 Pre-cast and concrete block substrates are required to be adhesive primed prior to application of self-adhering water resistive air barrier membrane.

3.3 APPLICATION OF SUBSTRATE ADHESIVE PRIMER

- .1 Required Adhesive Primer for SBS Modified Self-Adhered Membranes.
 - .1 For the application of SBS modified self-adhered window sill pan flashings, through-wall flashings and other applications of SBS modified self-adhered transition membranes, the substrate needs to be conditioned with applicable adhesive primer.
 - .2 Apply adhesive primer at rate recommended by manufacturer to all areas to receive SBS modified self-adhering sheet membrane as indicated on drawings by roller or spray and allow to fully dry.
 - .3 Adhesive primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day must be re-conditioned.
- .2 Adhesive Primer for Primary Water Resistive Air Barrier Membrane.
 - .1 Conditions not typically requiring adhesive-primers:
 - .2 Application above 40°F (5°C) to clean & dry wood and sheathing boards, such as plywood and OSB. Ensure substrate and membrane temperatures are above 40°F (5°C)
 - .3 Conditions requiring use of adhesive-primers:
 - .4 Metal, DensGlass® products, exterior grade sheathing board, Concrete, CMU and other masonry substrates.
 - .5 If appropriate adhesion is not obtained due to conditions beyond the control of the installer, the adhesion can be aided by continuous application of adhesive-primer to the substrate and laps. Ensure all primed surfaces are covered in the same day.

3.4 INSTALLATION OF AIR BARRIER SYSTEM

.1 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 (3 inches) on either side of the corner detail.
- .2 For inside corners, pre-treat the corner with a continuous 13mm (½ inch) bead of termination sealant.
- .3 Adhesive prime surfaces in an intermittent pattern, at a rate of 3 – 6 m²/L (200 – 250 sq ft/gal) where appropriate due to surface conditions, to achieve surface adhesion as per manufacturers' instructions and allow drying.
- .4 Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 50 mm (2 inches) overlap at all side laps and 75 mm (3 inches) overlap at all end laps of membrane.
- .5 Roll all laps and membrane with a counter top roller to ensure seal.

.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.
- .2 Prime surfaces in an intermittent pattern, at a rate of 3 – 6 m²/L (200 – 250 sq ft/gal) 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. Provide minimum 75 mm (3 inch) lap to all substrates.
- .4 Ensure minimum 50 mm (2 inches) overlap at all side laps and 75 mm (3 inches) overlap at all end laps of membrane.
- .5 Roll all laps and membrane with a counter top roller to ensure seal.

.3 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.
- .2 Prime surfaces in an intermittent pattern, at a rate of 3 – 6 m²/L (200 – 250 sq ft/gal) where appropriate [reference preceding spec note] 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 (3 inch) overlap at all end and 50 mm (3 inch) side laps of subsequent membrane applications.
- .6 Apply pressure to all membrane surfaces, laps and flashings using an appropriate roller to provide best possible surface adhesion.
- .7 At the end of each days work seal the top edge of the membrane where it meets the substrate with termination sealant. Trowel to 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 notifications 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. 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 membranes are not designed for permanent exposure. Good practice calls for covering as soon as possible, not to exceed 150 days.

END OF SECTION

1. GENERAL

1.1 Work in this section consists of furnishing all access, labour, materials, equipment, supervision and incidentals to supply the metal cladding and/or liner panel system(s) described herein and shown on the drawings including the supply and installation of all metal framing components and connections to secure the metal cladding system to the structural back-up.

1.2 Design Considerations

.1 Maximum offset from true alignment between two adjacent members abutting end to end in line: 1/16".

1.3 References

.1 CAN/CGSB 93.4-92: Galvanized and Aluminum-Zinc Alloy Coated Steel Siding, Soffits and Fascia, Prefinished, Residential.

.2 CAN3/CSA S136-12: North American Specification for the Design of Cold-Formed Steel Structural Members.

.3 CSSBI 20M-16: Standard for Sheet Steel Cladding for Architectural, Industrial and Commercial Building Applications.

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

.5 2010 National Building Code of Canada.

.6 Cladding to be designed to accommodate thermal movement over an ambient temperature range of -40°C to +50°C.

.7 Design expansion joints to accommodate movement in cladding and between cladding and structure, to prevent permanent distortion or damage to the cladding.

.8 Design wall system to maintain the following erection tolerances:

.1 Maximum variation from plane or location shown on shop drawings: 0.75 inch / 30 feet.

.2 Maximum offset from true alignment between two adjacent members abutting end to end in line: 0.04 inches.

1.4 Quality Assurance and Substitutions

.1 Manufacturer of cladding system and installer shall demonstrate at least five years' experience in projects similar in scope.

.2 This section establishes the standard of quality required for the cladding system. Proposed substitutions must meet this standard, and will be considered as follows:

.1 A written request for approval of a substitution is received at least seven (7) days prior to tender closing.

.2 The request includes a complete item-by-item description comparing the proposed substitution to the specified system, together with manufacturer's literature, samples, test data, engineering standards and performance evaluation indicating comparable standards to those specified.

1.5 Handling and Protection

- .1 Store cladding products and all components of the wall system in accordance with manufacturer's recommendations and protected from the elements.
- .2 Protect pre-finished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

1.6 Samples

- .1 Submit duplicate 12" x 12" samples of siding and flashing material, of colour and profile specified.
- .2 Profile and final colour selection to be approval by City of Winnipeg.

1.7 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 – Submittal Procedures.
- .2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, and related work.

2. MATERIALS

2.1 Steel Cladding

- .1 Fabricated from ASTM A653M-90 structural quality Grade 230 galvanized steel, with Z275 zinc coating, as designated by ASTM A653M-90 panel. Thickness to be 20 gauge (0.0299").
- .2 Pre-painted with HMP or 10,000 Series. Colour samples to be submitted to City of Winnipeg for review. Final colour will be selected by the City of Winnipeg after mock-up installation has been completed.
- .3 Acceptable product:
 - (a) Interior Liner Panels: Profile to match existing
 - Colour: To match existing as approved by City of Winnipeg

2.2 Supporting Assembly

- .1 Steel studs and track shall be in accordance with the ANSI North American Standard for Cold-Formed Steel Framing and shall have a minimum base steel thickness of 0.455 mm and a depth of 92.1 mm as indicated on Drawings.

2.3 Fastening System

- .1 All metal panel to support components shall utilize a No.14 x ½" HWH Teks screw incorporating Climaseal finish and Type 'S' washer, supplied and installed in accordance with manufacturer's specifications.
- .2 Paint all exposed fasteners threads to match metal panel colour.

2.4 Accessories

- .1 Flashing, Trim and Closures: Fabricate to profiles indicated on drawings, or as required to meet performance requirements. Use preformed corner pieces only. Double back exposed edges. Material to match cladding in exposed locations.
- .2 Sealants:
 - .1 Refer to Section 07 92 00 Joint Sealants.

3.0 EXECUTION

3.1 Fabrication

- .1 All components including flashings shall be fabricated wall components to comply with dimensions, profiles, thicknesses and details as shown on the drawings.
- .2 Fabricate all components of the system in the factory, ready for field installation.
- .3 Provide cladding and all accessories in longest practicable length to minimize field lapping of joints.

3.2 Execution

- .1 Install cladding in accordance with CGSB 93.5-92, and manufacturer's written instructions. Examine work of other trades over which cladding will be applied for conformity to drawings. Report all discrepancies to consultant prior to proceeding.
- .2 Install metal furring strips and support girts as indicated on drawings. Ensure girt installation provides a true surface.
- .3 Install continuous starter strips, inside and outside corners and edgings as indicated.
- .4 Install outside corners, fillers and closure strips with carefully formed and profiled work.
- .5 Install cladding in accordance with manufacturer's standard installation procedures, providing proper laps and detailing to ensure a tight face.
- .6 Maintain joints in cladding, true to line, tight fitting, hairline joints.
- .7 Components are to be attached in a manner that will not restrict thermal expansion and contraction. Oversize fastener holes as shown by 1/8" for metal panel pieces longer than 12'.
- .8 Caulk all junctions to adjoining work with sealant. Do work in accordance with Section 07 92 00.

3.3 Touch-up and Cleaning

- .1 Touch up minor paint abrasions with manufacturer approved touch-up paint.
- .2 Clean cladding by dry wiping.
- .3 Field paint all cut or exposed edges not treated with HMP coating with manufacturer approved coating.

3.4 Warranty

- .1 The system manufacturer and/or contractor shall provide a written single source and material warranty stating that the system shall be free of defects relating to workmanship or material deficiency for a minimum two-year period following installation. The following problems shall be specifically covered under the warranty:
 - a. Blistering, peeling or failure in the pre-finished metal panel coating system.
 - b. Dislodgement and/or displacement in the metal panel system including but not limited to the metal panel and steel framing which supports the cladding.

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 C919-12, Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .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 Section 01 33 00 - Submittal Procedures.
- .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 Section 01 33 00 - Submittal Procedures.
 - .1 Instructions to include installation instructions for each product used.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.5 PROJECT CONDITIONS

- .1 Environmental Limitations:
 - .1 Do not proceed with installation of joint sealants under following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees Celsius.
 - .2 When joint substrates are wet.

- .2 Joint-Width Conditions:
 - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

2.1 SEALANT MATERIALS

- .1 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 Silicones One Part.
 - .1 To CAN/CGSB-19.13.
 - .1 Acceptable material: 795 Silicone Building Sealant by Dow Corning.

2.3 JOINT CLEANER

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

Part 3 Execution

3.1 PROTECTION

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

3.2 SURFACE PREPARATION

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

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

3.6 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