Part 1 GENERAL

1.1 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D412-06ae2 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension

.2 ASTM D1970/D1970M-11 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

.3 ASTM E96/E96M-10 – Standard Test Method for Water Vapor Transmission of Materials

.4 ASTM E154-08a – Standard Test Methods for Water Vapor Retarders used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

.2 Canadian General Standards Board (CGSB)

.1 CGSB 37.29-M89 – Rubber-Asphalt Sealing Compound

1.2 QUALIFICATIONS

.1 Waterproofing shall be installed by a manufacturer-approved applicator, with minimum two (2) years related experience.

1.3 DELIVERY AND STORAGE

.1 Deliver and store materials undamaged in original containers with manufacturer’s labels and seals intact.

.2 Store role materials horizontally in original packaging.

.3 Store adhesives and primers at temperatures of 5°C and above to facilitate handling.

.4 Protect rolls from direct sunlight until ready for use.

Part 2 PRODUCTS

2.1 WATERPROOFING MEMBRANE SYSTEM - WALLS

.1 The waterproofing system shall consist self-adhesive rubberized asphalt/polyethylene asphalt/polyethylene waterproofing membrane.

.1 Acceptable product: Grace Bituthene 3000 Membrane.

.2 Primer: as recommended by the manufacturer.

2.2 WATERPROOFING MEMBRANE SYSTEM - SLAB

.1 The waterproofing system shall consist self-adhesive rubberized asphalt/polyethylene asphalt/polyethylene waterproofing membrane.

.1 Acceptable product: Grace Preprufe 300 membrane.

.2 Primer: as recommended by the manufacturer.

Part 3 EXECUTION

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section. Commencement of Work or any parts thereof shall mean acceptance of the prepared substrate.

3.2 SURFACE PREPARATION WALLS

.1 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, frost of other contaminants. Fill spalled areas in substrate to provide an even plane.

.2 All concrete shall have cured for a minimum of seven (7) days, and must be dry before waterproofing membranes are applied. Lightweight structural concrete must be cured a minimum of 14 days.

.3 Voids, ridges, honeycombing and other damaged surfaces, shall be repaired by the trades involved, using materials compatible with the membrane system to leave a level surface.

.4 All joints or transitions between planes, shall be sharply formed and free of broken edges, loose aggregate, preformed joint fillers, sealants, or back-up material.

3.3 APPLICATION WALLS

.1 Apply materials in strict accordance with manufacturer’s recommendations.

.2 Use appropriate waterproofing membrane as recommended by manufacturer based on air and surface temperature at time of application.

.3 Apply primer using roller or spray at rate recommended by manufacturer. Allow minimum thirty (30) minute open time. Primed surfaces not covered by waterproofing membrane during the same working day must be re-primed.

.4 All cracks in concrete 1.5mm to 3mm (1/16” to 1/8”) wide to be pre-treated with 1.5mm (1/16”) coating of liquid membrane 50mm (2”) wide centred on crack, or apply a 150mm (6”) wide strip of membrane centred over crack. Provide 75mm (3”) end laps.

.5 Horizontal to vertical inside corner transition areas to be pre-treated with liquid membrane fillet extending 19mm (3/4”) vertically and horizontally from the corner. Apply a minimum 225mm (9”) strip of membrane centred at the joint.

.6 All outside corners to be pre-treated with minimum 225mm (9") strip of membrane reinforcing at the joint.

.7 Where three (3) or more planes come into contact, reinforce with cut section of membrane reinforcing sheet as per manufacturer's instructions.

.8 For vertical applications, apply waterproofing membrane to prepared substrate in lengths of 2400mm (8ft) or less. Provide 65mm (2.5") laps at both sides and ends. Position for alignment and remove protective film. Press firmly into place. Promptly roll all laps with a counter top roller to effect seal. If more than one length is required on a vertical surface, apply in a shingle fashion. Terminate membrane using mastic or termination bar, reglet or counter flashing. All laps within 300mm (1ft) of a 90° change in plan to be sealed.

.9 For horizontal applications, apply waterproofing membrane to prepared substrate beginning at the low point of the surface and working to the high point in a shingle fashion. Provide 65mm (2.5") side and end laps. Roll membrane immediately over entire surface to effect seal. At all terminations and T-joints, seal laps using mastic. All laps within 300mm (1ft) of a 90° change in plane are to be sealed.

3.4 SURFACE PREPARATION SLAB

.1 Follow manufacturer's written installation instructions.

.2 Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability.

.3 Horizontal: The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

3.5 MEMBRANE INSTALLATION

.1 Follow manufacturer's written installation instructions.

.2 Apply at temperatures of 25°F (-4°C) or above. When installing Preprufe in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing Tape should be applied to clean, dry surfaces and the release liner must be removed immediately after application.

.3 Place the membrane HDPE film side to the substrate with the clear plastic release

liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed

.4 Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the lastic release liner from between the overlaps as the two layers are bonded together.

Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating.

Any initial tack will quickly disappear

3.6 POURING OF CONCRETE SLAB

.1 Ensure the plastic release liner is removed from all areas of Preprufe membrane and tape.

.2 It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

.1 ASTM C591-01, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.

.2 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.

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

.1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

Part 2 Products

2.1 INSULATION

.1 Extruded polystyrene XPS: to CAN/ULC-S701.

.1 Type: 4.

.2 Thickness: as indicated.

.3 Edges: square

.2 Rigid Cellular Polyisocyanurate:

.1 Unfaced: to ASTM C591.

.1 Thickness: as indicated.

2.2 ADHESIVE

.1 Adhesive (for polystyrene): to CGSB 71-GP-24.

2.3 ACCESSORIES

.1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.

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 such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys, CAN/CGA-B149.1 and CAN/CGA-B149.2 type B, L vents.

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

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

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

3.3 EXAMINATION

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

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

3.4 RIGID INSULATION INSTALLATION

.1 Install insulation to manufacturer’s written instructions..

.2 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.

3.5 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 NBCC 2010; Part 5 - Environmental Separation

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit submittals in accordance with Section 01 33 00.

.2 Provide drawings of special joint conditions.

.3 Submit manufacturer's product data sheets.

.4 Submit manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

.1 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

.2 Maintain one copy of documents on Site.

1.4 QUALIFICATIONS

.1 Applicator: Company specializing in performing work of this section with minimum 5 years documented experience with installation of air/vapour barrier systems. Completed installation must be approved by the material manufacturer. .

.2 Applicator: Company who is currently licensed by National Air Barrier Association, must maintain their license throughout the duration of the project.

1.5 PRE- INSTALLATION MEETINGS

.1 Convene one week prior to commencing Work of this section.

1.6 CO-ORDINATION

.1 Co-ordinate with roofs air/vapour barriers to insure a complete and compatible system of joining the two systems.

1.7 DELIVERY, STORAGE AND HANDLING

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

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.3 Avoid spillage. Immediately notify Contract Administrator if spillage occurs and start clean up procedures.

.4 Clean spills and leave area as it was prior to spill.

1.8 PROJECT ENVIRONMENTAL REQUIREMENTS

.1 Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

1.9 SEQUENCING

.1 Sequence work to permit installation of materials in conjunction with related materials and seals.

1.10 QUALITY ASSURANCE

.1 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

.2 Maintain one copy of documents on Site.

1.11 QUALIFICATIONS

.1 Applicator: Company specializing in performing work of this section with minimum 5 years documented experience with installation of air/vapour barrier systems. Completed installation must be approved by the material manufacturer.

.2 Applicator: Company who is currently licensed by National Air Barrier Association or certifying organization must maintain their license throughout the duration of the project.

Part 2 Products

2.1 SHEET MATERIALS

.1 Self-adhesive air and vapour barrier membrane: self-adhered membrane consisting of an SBS rubberized asphalt compound integrally laminated to a cross laminated polyethylene film.

.1 Thickness: 1.0 mm.

.2 Tensile strength membrane ASTM D412: 3.4 MPa minimum.

.3 Tensile strength film ASTM D412: 40 MPa minimum.

.4 Acceptable material: Bakor Blueskin SA.

.5 Submit request for substitution in accordance with Section 01 33 00.

.2 Thru wall flashing: self-adhered membrane consisting of an SBS rubberized asphalt compound integrally laminated to a cross laminated polyethylene film.

.1 Tensile strength membrane ASTM D412: 5520 kPa minimum.

.2 Tensile strength film ASTM D412: 34500 kPa minimum.

.3 Tensile strength film ASTM D412: 34500 kPa minimum.

.4 Acceptable material: Bakor Blueskin TWF.

.5 Submit request for substitution in accordance with Section 01 33 00.

.3 Transition membrane: compatible with wall and roof air/vapour barriers.

.1 Self-adhered membrane consisting of an SBS rubberized asphalt compound integrally laminated to a cross laminated polyethylene film.

.2 Acceptable material: Bakor Blueskin SA.

.3 Submit request for substitution in accordance with Section 01 33 00.

2.2 SEALANTS

.1 Sealants in accordance with Section 07 92 00 - Joint Sealants and compatible with adjacent materials.

.2 Butyl Sealant Type A : CGSB 19-GP-14M, butyl rubber base, single component, solvent release, non-skinning, Shore "A" Hardness Range of 10 to 30.

.3 Sealant Type B: CAN/CGSB-19.13M, single component, chemical curing, capable of continuous water immersion, non-sagging type, Shore "A" Hardness Range of 20 to 35.

.4 Primer: Recommended by sealant manufacturer to appropriate to application.

.5 Substrate Cleaner: Non-corrosive type recommended by sealant manufacturer, compatible with adjacent materials.

2.3 ACCESSORIES

.1 Thinner and cleaner for Butyl, Neoprene Sheet: As recommended by sheet material manufacturer.

.2 Attachments: Galvanized steel bars and anchors.

Part 3 Execution

3.1 EXAMINATION

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

.2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer’s requirements.

.3 Report any unsatisfactory conditions to the Contract Administrator in writing.

.4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

3.2 PREPARATION

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

.2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.

.3 Ensure all substrates are free of surface moisture prior to application of membrane and primer.

.4 Ensure metal closures are free of sharp edges and burrs.

.5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION

.1 Install air/vapour barrier materials in accordance with manufacturer's instructions.

.2 Install transition material and primer to provide a continuous seal between wall and roof air/vapour barrier.

.3 Install sealant materials in accordance with manufacturer's instructions.

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

3.4 PROTECTION OF WORK

.1 Protect finished Work in accordance with Section 01 61 00 - Common Product Requirements.

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

.3 Ensure finished Work is protected from climatic conditions.

3.5 SCHEDULES

.1 Wall Air/Vapour Barrier Over Exterior Surface of substrate: Place sheet.

.2 Window / Door Frame: Lap sheet seal from wall air seal surface with 3” (75 mm) of full contact over firm bearing to window frame with 1” (25 mm) of full contact. Edge seal with sealant.

.3 Wall and Roof Junction: Lap transition material from wall seal material with 6” (150 mm) of contact over firm bearing to roof air seal membrane with 4” (100 mm) of full contact.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

- .1 ASTM B136 - Standard Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum.
- .2 ASTM C1186 - Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
- .3 ASTM D1730 - Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.
- .4 ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .5 ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- .6 ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.
- .7 ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data: Submit manufacturer's printed product literature, specifications and data sheets.

.3 Shop drawings: Provide detailed drawings of a typical non-standard applications of panel junctions and penetrations which are outside the scope of the standard details and specifications provided by the manufacturer

.4 Samples: For each finish product specified submit two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

.5 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.3 DELIVERY STORAGE AND HANDLING

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

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

1.4 ENVIRONMENTAL REQUIREMENTS

.1 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.

1.5 WARRANTY

.1 Provide manufacturer's standard material warranty.

.2 Provide manufacturer's 2 year installation warranty.

Part 2 Products

2.1 MANUFACTURER

.1 James Hardie Building Products Inc

2.2 CEMENT PANELS

.1 Hardie Reveal Panel Smooth 5/16 inches thick. Product shall be engineered for climate conditions

.1 Width and lengths to approved shop drawings.

.2 Code compliance of panel material.

.1 Fiber-cement panels, complies with ÅSTM C 1186 Type A Grade II.

.2 Fiber-cement panels, complies with ÅSTM E 136 as a noncombustible material.

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

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

.5 Fiber-cement panels, tested to ÅSTM E330 for Transverse Loads.

2.4 FURRING (STRAPPING)

.1 Rainscreen Cavity: Install Hardie Reveal Panels on a drained and vented rainscreen cavity, with a minimum 3/8 inch (9.5mm) air cavity. Selection of cavity vent materials shall be incorporated into the design to prevent insect and pest entry.

2.5 ACCESSORIES

.1 Trims: Reveal™ Trims by Fry Reglet in the following profiles supplied by James Hardie. Reveal Trims confirm to a 6063 alloy in T-5 temper with a minimum thickness of 0.050 inch. All reveal trims are 12 feet in length. Easytrim is also acceptable

.1 Horizontal trim.

.2 Vertical trim.

.3 Outside corner trim.

.4 Inside corner trim.

.5 J channel trim.

.6 Drip cap trim.

.2 Finishes of Reveal Trims:

.1 Chem Film for field painting of Reveal Trims; Chem Film Coating shall conform to ÅSTM N D1730.

.2 Clear anodized metal finish aesthetic; clear anodizing shall conform to ASTM B244 and ASTM B136.

.3 Color coated finish as supplied in accordance with manufacturers requirements

2.6 FASTENERS

.1 Fasteners shall be of high quality stainless steel to ensure resistance to corrosion. For field painting, fasteners should be treated to accept paint adhesion.

.2 Type, size and length as recommended by manufacturer.

2.7 FINISH

.1 Factory Primer: Provide factory applied universal primer.

.1 Primer: Factory applied sealer/primer by James Hardie. Apply flat sheen finishes to panels.

.2 Topcoat: Refer to Section 09 90 00.

.2 Factory Finish for Trim:

.1 Trim for Factory-Applied Coating and Field-Applied Finish: Chem Film.

.2 Trim for Factory-Applied Finish and No Field-Applied Finish: Clear anodized.

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 INSTALLATION

.1 Furring: Install furring on a minimum 3/8 inch rainscreen cavity, or in accordance with local building code for rainscreen requirements.

.2 Panel Installation:

.1 Place fasteners no closer than 3/4 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.

.2 Use fasteners as specified by manufacturer.

.3 Install panel using 1/2 inch (13 mm) spacers at horizontal joints. Leave bottom edge of panel above all horizontal trims exposed, no caulking shall be placed at this overlap of Horizontal Reveal Trim. Factory primed edge shall always be used.

.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.

.7 Maintain clearance between siding and adjacent finished grade.

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

3.3 FINISHING

.1 Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic exterior flat grade paint with flat finish within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

.2 Field cut edges shall be coated during the installation process using an exterior grade primer/sealer that is compatible with the type of paint to used on project.

3.4 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CSA-S136 for the design of Cold Formed Steel Structural Members

.2 Canadian Sheet Steel Building Institute Standards 20M.

.3 National Building Code of Canada

1.2 DESIGN REQUIREMENTS

.1 Design wall system to resist Wind loads, positive and negative, expected in this geographical region NBCC climatic data, 50 year probability

.2 Deflection of the wall system is not to exceed $1/180^{th}$ of the span for the wind load based on serviceability limit states.

.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 nighttime sky heat loss.

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

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

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

.1 Maximum variation from plane or location shown on shop drawings: 20 mm/10 m (3/4 inch/30 feet).

.2 Maximum offset from true alignment between two adjacent members abutting end to end in line: 1 mm (0.04 inches).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit submittals in accordance with Section 01 33 00

.2 Product data: submit manufacturer's printed product literature, specifications and data.

.3 Submit Shop drawings:

.1 Indicate arrangement of cladding system, including dimensions, location of joints, profiles of inner and outer skin, types and locations of supports, fasteners, flashing, closures and all metal components related to the cladding installation

.2 Drawings shall be signed and sealed by a Professional Engineer, attesting to the ability of the metal panels assembly to withstand the specified loads.

.4 Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into manual specified in Section 01 78 00

.5 Samples: Submit duplicate samples of siding material, of colour and profile specified.

.6 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.4 WARRANTY

.1 Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: 40 years after the date of Substantial Completion

Part 2 Products

2.1 MATERIALS

.1 Metal Wall System:

.1 Sub-girts: Minimum 1.21 mm (0.048") thick formed galvanized steel, ASTM A653M Grade 230 with Z275 zinc coating. Full depth of wall system, factory notched and formed to match liner.

.2 Steel Cladding:

.1 Profile: to match existing, thickness 24 ga.

.2 Fabricated from Z275 galvanized sheet steel conforming to ASTM A653M Grade 230 or AZ150 Galvalume, sheet steel conforming to ASTM A792M Grade 230. having a nominal core thickness 0.76 mm

.3 Fasteners: Galvanized, hidden/exposed to match existing.

.2 Finishes: Prepainted with WeatherX™

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

2.2 ACCESSORIES

.1 Flashing: In accordance with Section 07 62 00. Material to match cladding in exposed locations, galvanized material in concealed locations. Custom fabricated to suit architectural details, as required. Use preformed corner pieces only. Double back exposed edges.

.2 Closures: Metal closures to suit profiles selected, to manufacturer's recommendations.

.3 Sealants:

.1 Concealed: Tape or compound, non-skinning, non-drying, butyl rubber.

.2 Exposed: Acrylic co-polymer to CGSB 19GP-5M, One part silicone to CGSB CAN2-19.13

2.3 FABRICATION

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

.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.

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 INSTALLATION

.1 Install metal siding in accordance with manufacturer's written instructions.

.2 Sub-girt framing system: Install sub-girts. Frame all openings in the cladding.

.3 Flashing: Install starter flashing, drip and other flashing, and corners, edgings, window and door flashing as shown on the drawings.

.4 Exterior Cladding:

.1 Install exterior cladding in accordance with manufacturer's standard installation procedures, providing proper laps and detailing to ensure a weathertight face.

.2 Install finishing flashing and cap flashing.

.5 Sealants: Install sealants at junctions with adjoining work, and where shown on the drawings, in accordance with Section 07 92 00.

3.3 CLEANING

.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 Contract Administrator and only where appearance after touch-up is acceptable to Contract Administrator.

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

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

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 The Aluminum Association Inc. (AA)

.1 Aluminum Sheet Metal Work in Building Construction-2002.

.2 AA DAF45-03(R009), 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 A606-04, 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-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.5 ASTM B32-08, Standard Specification for Solder Metal.

.6 ASTM D523-08, Standard Test Method for Specular Gloss.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 2011.

.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 A123.3-05(R2010), 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,(R2005) Windows.

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

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit shop drawings.

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

2.2 PREFINISHED ALUMINUM SHEET

.1 Finish: factory applied coating to match metal wall cladding as indicated.

2.3 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: to Section 07 92 00.

.5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness 0.45 mm same as sheet metal being secured.

.6 Fasteners: of same material as sheet metal, to CSA B111, of length and thickness suitable for metal flashing application.

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

.8 Solder: to ASTM B32, alloy composition Sn.

.9 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.

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

2.4 FABRICATION

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

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

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

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

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

2.5 METAL FLASHINGS

.1 Form flashings, to profiles indicated, thickness indicated galvanized , prefinished steel sheet.

Part 3 Execution

3.1 INSTALLATION

.1 Install sheet metal work in accordance with CRCA details, Aluminium Sheet Metal Work in Building Construction, 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 Counterflash bituminous flashings with vertical surfaces and curbs.

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

.9 Caulk flashing at reglet, cap flashing with sealant.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Fire stopping and smoke seals within mechanical assemblies and electrical assemblies are specified in mechanical and electrical sections respectively.

1.2 REFERENCES

.1 Underwriter's Laboratories of Canada (ULC)

.1 ULC-S115-2005, Fire Tests of Firestop Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit submittals in accordance with Section 01 33 00.

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

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

.4 Shop drawings to indicate locations where firestopping is used, required fire resistance rating, the material to be used and the tested design system (ULC).

.5 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.

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 and conforming to special requirements specified in 3.4.

.2 Firestop system rating: as indicated.

.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 partitions and walls.

.2 Top of fire-resistance rated partitions and walls.

.3 Intersection of fire-resistance rated partitions and walls.

.4 Control and sway joints in fire-resistance and walls.

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

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

.7 Around mechanical and electrical assemblies penetrating fire separations.

.8 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 CO-ORDINATION

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

.2 Text to complete other various Sections containing sealant or caulking specifications.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

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

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

.3 CAN/CGSB-19.22-M89 Mildew Resistant, Sealing Compound for Tubs and Tiles.

.4 CAN/CGSB-19.24-M90 Multi-component, Chemical Curing Sealing Compound.

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

.1 ASTM C919-08, Standard Practice for Use of Sealants in Acoustical Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit submittals in accordance with Section 01 33 00.

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

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

.5 Submit manufacturer's 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.

.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 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.

1.6 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.

.3 Ventilate area of work as directed by Construction Manager by use of approved portable supply and exhaust fans.

1.7 QUALITY ASSURANCE

.1 Perform the work by experienced and skilled mechanics thoroughly trained and competent in the use of caulking and sealing equipment and the specified materials with at least five years experience.

.2 Arrange with the caulking and sealant manufacturers for a visit at the job Site by one of their technical representatives before beginning the caulking and sealing

installation to discuss with the Contractor and the Construction Manager the procedures to be adopted, to analyse Site conditions and inspect the surfaces and joints to be sealed, in order that type of sealant recommendations may be made for typical joint configuration.

.3 Discuss the following items and provide a written report indicating:

.1 Sealants and caulking materials selected for use from those specified;

.2 Surface preparation requirements;

.3 Priming and application procedures;

.4 Verification that sealants and caulking are suitable for purposes intended and joint design;

.5 Sealants and caulkings are compatible with other materials and products with which they come in contact including but not limited to sealants provided under other Sections, insulation adhesives, bitumens, block, concrete, metals and metal finishes.

.6 Verification that sealant and caulking are suitable for temperature and humidity conditions at time of application and will not stain adjacent surfaces;

.7 Recommended sealant for each type of joint configuration;

.8 Joint design;

.9 Anticipated frequency and extent of joint movement.

.10 Number of beads to be used in the sealing operation;

.11 Suitability of durometer hardness and other properties of material to be used;

.12 Weather conditions under which work will be done.

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 Exterior general use (non-traffic bearing): Silicone One Part. to CAN/CGSB-19.13.

.1 Acceptable Products:

.1 Dow 790/795

.2 GE Silpruf./silfruf LM/silpruf NB

.3 Sonneborne sonolastic 150 / sololastic omiseal

.2 Urethanes One Part.

.1 Self-Leveling to CAN/CGSB-19.13, Type 1

.1 Acceptable Products

.1 Sonneborne SL1

.2 Tremco THC 900

.3 PRC 6000/6006

.4 Vulkem 116/45

.5 Bostik Chem-Calk 900

.6 Sika Sikaflex 1a

.3 Acrylic Latex One Part to CAN/CGSB-19.17.

.1 Acceptable material:

.1 Sonnoborn Sonolac

.2 Tremco 834

.3 PRC 2000

.4 Sternson Acry Flex

.5 GE Acryseal

.4 Sealants for vertical and horizontal non-traffic bearing joints to CGSB 19-GP-24.

.1 Type 1: high, low temperature range, wet conditions, movement range to 25% polysulphide, non-staining, non-fading. Caulking to withstand environmental conditions of locale.

.2 Type 2: normal temperature range, dry conditions, movement range to 10%. Paintable, latex base caulking, interior conditions only.

.3 Three part epoxidized polyurethane sealant: to meet the specified requirements of CGSB-19.24-M90.

.5 Acoustical Sealant.

.1 To ASTM C919.

.2 Acceptable material:

.1 Tremco acoustic sealant

.2 Pl 2000 bulldog

.6 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 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.

.5 Sealant for fireproofing: where cables, conduits, pipes and ducts pass through floors and fire-rated walls, pack space between wiring and sleeve full with penetrating foam sealing system, ULC listed meeting CAN4-S115-M85 and ASTM E814 fire barrier requirements. Co-ordinate with Section 07840.

.6 Colours: Colours shall be selected from manufacturer's standard colour range. Colours to match material / background colour upon which they occur. Final colour selection by Contract Administrator.

2.3 SEALANT SELECTION

.1 Joints in concrete: CAN/CGSB-19.24.

.2 Joints between frame and cladding; CAN/CGSB-19.24.

.3 Joints in metal cladding; CAN/CGSB-19.24.

.4 Joints in metal flashing; CAN/CGSB-19.24.

.5 Joints between frame and gypsum board: CAN/CGSB-19.13 Type MCG, Class 2-40.

.6 Joints in gypsum board walls: CAN/CGSB-19.13 Type MCG, Class 2-40.

.7 Joints in washrooms, janitors room etc: CAN/CGSB-19.22.

.8 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, waterclosets, basins, vanities): Sealant type: CAN/CGSB-19.22

.9 Joints in polyethylene and where acoustical sealant is specified: ASTM C919.

2.4 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