Part 1 General

1.1 REFERENCES

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

.1 ASTM C553-13, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 Canadian Standards Association (CSA International)

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

.3 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S702.1-01(2004), Standard for Mineral Fibre Insulation.

1.2 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 Manufacturer's Instructions:

.1 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.

.3 Convene pre-installation meeting one week prior to beginning in accordance with Section 01 14 10 – Scheduling and Management of Work.

.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordinate with other building subtrades.
.4 Review manufacturer's installation instructions and warranty requirements.

.4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

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

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

Part 2 Products

2.1 INSULATION

.1 Batt and blanket mineral fibre: to ASTM C553.

.1 Thickness: 140 mm.

2.2 ACCESSORIES

.1 Staples: 12 mm minimum leg.

.2 Tape: as recommended by manufacturer.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSULATION INSTALLATION

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

.2 Install insulation and vapour permeable membrane facing cold side. Lap ends and side flanges of membrane over framing members. Retain in position with staples installed as recommended by manufacturer. Tape seal butt ends and lapped side flanges. Do not tear or cut vapour barrier.

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

.4 Do not compress insulation to fit into spaces.

.5 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.

.6 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete.

.2 Section 06 10 10 – Rough Carpentry.

.3 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

.1 American Architectural Manufacturers Association (AAMA)

.1 AAMA 501-15, Methods of Test for Metal Curtain Walls.

.2 American Society for Testing and Materials (ASTM)

.1 ASTM E 783-02(2010), Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.

.2 ASTM E 330-M-14, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static air Pressure Difference.

.3 ASTM E 1186-03(2009), Standard Practices for Air Leakage Site Detection in Building Envelope and Air Retarder Systems.

1.3 PERFORMANCE REQUIREMENTS

.1 Select and install wall and roof components and assemblies to resist air leakage caused by static air pressure across exterior wall, soffits and roof assemblies, including windows, glass, doors, and other interruptions to integrity of wall and roof systems.

.2 Select and install wall and roof components and assemblies to resist air leakage caused by dynamic air pressure across exterior wall , soffits and roof assemblies, including windows, glass, doors and other interruptions to integrity of wall and roof systems; as measured in accordance with ASTM E 783 ASTM E 330.

.3 If ongoing testing is required throughout the installation of the air/vapour barrier system, qualitative testing methods shall be performed in accordance with ASTM E 1186 ASTM D 4541.

.4 Provide continuity of air/vapour barrier materials and assemblies in conjunction with materials described in Section 03 30 00 - Cast-in-Place Concrete, and 07 92 10 - Joint Sealing.

1.4 SUBMITTALS

.1 Submit manufacturer’s product data sheets in accordance with Section 01 33 00 - Submittal Procedures.

.1 Provide data on material characteristics, performance criteria and limitations.

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.2 Submit manufacturer's installation instructions in accordance with Section 01 33 00 - Submittal Procedures.

1.5 QUALITY ASSURANCE

.1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.

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

.3 Perform Work in accordance with Canadian Urethane Foam Contractor's Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

.4 Maintain one copy of documents on site.

1.6 MOCK-UP

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

.2 Construct typical exterior wall panel, 3 m long by 3 m wide, incorporating window and door openings with frame, stainless steel sill siding intersection and sill installed, insulation, building corner condition, junction with roof system and; illustrating materials interface and seals.

.3 Locate where directed by Departmental Representative.

.4 Mock-up may remain as part of Work.

.5 Allow 24 h for inspection of mock-up by Departmental Representative before proceeding with air/vapour barrier work.

1.7 PRE- INSTALLATION CONFERENCE

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

1.8 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 Departmental Representative if spillage occurs and start clean up procedures.

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

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1.9 WASTE MANAGEMENT AND DISPOSAL

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

.2 Place materials defined as hazardous or toxic waste in designated containers.

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

1.10 SEQUENCING

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

Part 2 Products

2.1 MATERIALS

.1 Membranes:

.1 Air vapour barrier membrane, self adhering: Vapour permeable water resistive, modified polyolefin tri-laminate film surface and patented permeable adhesive technology with split-back poly-release film, (to be used on plywood behind concrete block veneer and wrapping around all new door installations)

.1 Thickness 0.58 mm

.2 Water Vapour Permeance (ASTM E96) 1658 ng/Pa.m².s.

.3 Application Temperature, min: -7°C

.4 Service Temperature: -40°C to +82°C

.5 Average Breaking Force, dry: 127 lbf / 565 N MD

.6 Accelerated Aging (ICC-ES /AC48): Pass

.7 Cycling and Elongation (ICC-ES /AC48): Pass

.8 Water Resistance (AATCC TM127):Pass

.9 Low Temperature Flexibility (ECC-EC AC38/3.3.4): Pass

.10 Peel Adhesion to Unprimed Plywood (ECC-EC AC38,AAMA 711-07): Pass

.11 Air Leakage of Air Barrier assemblies (STM E2357): Pass

.12 Air Permeance (ASTM E2178): Pass

.13 Nail Sealability (ASTM D1970): Pass

.14 Dry Tensile Strength (ASTM D882):

.1 41 lbf/182N MD

.2 29 lbf/129N CD

.15 Surface Burning Characteristics (ASTM E84):

.1 Flame Spread: Class A

.2 Smoke Development: Class A

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.16 Low application temperature: -7 degrees C

.2 Waterproof membrane, high temperature, (to be used under all new standing seam metal roof and under new stainless steel flashing at the top of new concrete block wall sill siding interface)

.1 Thickness: 1.0 mm

.2 Application Temperature: 5°C and above

.3 Elongation: 250% min.

.4 (ASTM D412 Die C Modified): (To ultimate failure of rubberized asphalt)

.5 Tensile strength: 4128 kN.m²min.

.6 Membrane (ASTM D412): (600 psi min.)

.7 Flow @ 110°C (ASTM D1970): None

.8 Adhesive to Plywood (ASTM D903): 850 N/m

.9 Flexibility at -43°C (ASTM D1970): Pass

.10 Air Leakage @ 75 PA (ASTM E2178): ,0.004 cfm/ft²

.11 Water Vapour Transmission (ASTM E96): 2.8ng/Pa.sm² (0.05 perms)

.2 Materials: As required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

Part 3 Execution

3.1 PREPARATION

.1 Prepare substrate surfaces in accordance with air/vapour barrier material manufacturer's instructions.

3.2 INSTALLATION

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

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

.3 Apply sealants within recommended application temperature ranges.

3.3 PROTECTION OF FINISHED 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.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.3 Section 07 92 10 - Joint Sealing.

1.2 DESCRIPTION

.1 Work furnished and included:

.1 Supporting sub-girts.
.2 Cladding profile.
.3 Accessories including associated flashings, closures and sealants.

.2 Related work not included:

.1 Structural framing members including purlins, eave and ridge elements and other elements required to support the cladding system.
.2 Doors, louvers, sashes, ventilators as well as their supporting framing.
.3 Caulking of elements.
.4 Flashings associated with other trades.

1.3 REFERENCES

.1 Design of cladding system in accordance to the latest edition of

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

1.4 SUBMITTALS

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

.1 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for caulking materials during application and curing.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, metal furring, and related work.

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.3 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.

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

.3 Samples:

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

.2 Submit duplicate samples of wall siding and soffit material to be reviewed with Departmental Representative, of colour and profile specified.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

.1 Manufacturer of wall 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 complete metal wall 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 tem (10) 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.

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

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

.5 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 01 14 10 – Scheduling and Management of Work.

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

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

.8 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 nightime sky heat loss.

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

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

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

.1 Maximum variation from plane or location shown on shop drawings: 20 mm/10m.

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

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert used metal cut-offs from landfill by disposal into the on-site metals recycling bin removed for disposal at the nearest metal recycling facility.

.3 Divert reusable materials for reuse at nearest used building materials facility.

.4 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

1.7 MAINTENANCE DATA

.1 Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into maintenance manual.

1.8 PRODUCT DELIVERY, HANDLING AND STORAGE

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

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

1.9 GUARANTEE

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

1.10 WARRANTY

.1 Provide a manufacturer's written warranty. Furnish panel manufacturer's written warranty covering failure of factor-applied exterior finish within the warranty period. Warranty period for finish: (40 years) after the date of substantial completion. The values are based on normal environmental and exclude any aggressive atmospheric conditions.

.1 Siliconized polyester – SMP will not crack, chip or peel (loose adhesion) for 40 years from date of installation (40.5 years from application) This does not include minute fracturing that may occur during the normal fabrication process. Siliconized Polyester – SMP will not chalk in excess of a number 6 rating in

accordance with ASTM D-4214-96 method D659 at any time for thirty (30) years from date of installation (30.5 years from application) will not change colour more than eight (8.0) Hunter ΔE units as determined by ASTM method D-2244-02.

Part 2 Products

2.1 STEEL CLADDING AND COMPONENTS

.1 Strip siding: to CGSB 93.4

.2 Type 1

- .1 Finish coating: Siliconized polyester (SMP).
- .2 Colour: Pacific Turquoise.
- .3 Gloss: low.
- .4 Thickness: 0.61 mm base metal thickness.
- .5 Profile: 1015 mm wide 35 mm deep, 914 mm wide, 762 mm panel length, preformed interlocking joints, fastener holes prepunched.
- .6 40 year paint warranty.
- .7 Installed with self drilling stainless steel screws and neoprene/ stainless steel washers.

.3 Type 2

- .1 Finish coating: Siliconized polyester (SMP).
- .2 Colour: Pacific Turquoise.
- .3 Gloss: low.
- .4 Thickness: 0.61 mm base metal thickness.
- .5 Profile: Corrugated horizontal siding. Ribs are 22 mm high, distance between ribs is 68 mm. 878 mm panels.
- .6 The siding is going to be furred to meet the same profile as the siding Type 1, see Architectural drawings.

.4 Soffit: to CGSB 93.4,:

- .1 Finish coating: Siliconized polyester (SMP).
- .2 Colour: Bone White.
- .3 Gloss: low.
- .4 Thickness: 0.76 mm base metal thickness.
- .5 Profile: depth: 39 mm x 300mm wide, vented 0.1 ^{m2} of opening for every 30 ^{m2} of building area preformed with small perforations.

.5 Fascia facings and exposed trim: to CGSB 93.4, Class plain:

- .1 Finish coating: Class F1S F2S.
- .2 Colour: Pacific Turquoise selected by Departmental Representative.
- .3 Gloss: low.
- .4 Thickness: 0.76 mm base metal thickness.

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.5 Profile: as indicated on drawings.

2.2 ACCESSORIES

.1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, colour and gloss as cladding, with fastener holes pre-punched.

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

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

.4 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 FASTENERS

.1 Nails: CSA B111. Screws: ANSI B18.6.4. Purpose made stainless steel, colour matched to cladding.

.2 Stainless steel with neoprene and stainless steel washers.

.3 Hidden fastener profiles on soffit siding.

2.4 SHEATHING MEMBRANE

.1 Exterior vapour permeable bituminous wall sheathing as indicated, on drawings.

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 EXAMINATION

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

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

3.3 INSTALLATION

.1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions

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.2 Sub-girt framing system:

.1 Install sub-girts. Frame all openings in the cladding.

.2 Flashing;

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

.3 Exterior Cladding;

.1 Install exterior cladding (and soffit) 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.

.4 Sealants;

.1 Install sealants at junctions with adjoining work, and where shown on the drawings, in accordance with Section 07 92 10.

3.4 CLEANING

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

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

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

.4 Replace damaged panels and components that, in opinion of the Departmental Representative, cannot be satisfactorily repaired.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 01 45 00 – Testing Quality Control.

.4 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

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

.1 ASTM A240/A240M-16a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

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

.3 ASTM A792/A792M-10(2015), Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.

.4 ASTM B32-08(2014), Standard Specification for Solder Metal.

.5 ASTM B370-12, Standard Specification for Copper Sheet and Strip for Building Construction.

.6 ASTM D523-14, Standard Test Method for Specular Gloss.

.7 ASTM D822-13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.2 Canadian Standards Association (CSA International).

.1 CAN/CSA A123.3-05(R2015), Asphalt Saturated Organic Roofing Felt.

.3 Department of Justice Canada (Jus).

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

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

.1 Material Safety Data Sheets (MSDS).

.5 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC).

.1 CCMC-2002, Registry of Product Evaluations.

.6 Transport Canada (TC).

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

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1.3 SUBMITTALS

.1 Submit proof of manufacturer's CCMC Listing and listing number to Departmental Representative.

.2 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence and cleaning procedures.

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

.4 Submit WHMIS MSDS - Material Safety Data Sheets. WHMIS acceptable to Labour Canada, and Health and Welfare Canada.

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

.6 Indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.

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

.8 Submit duplicate 300 x 300 mm samples of each sheet metal material.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

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

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

.4 Separate for reuse and recycling and place in designated containers Steel, Metal, Plastic waste in accordance with Waste Management Plan.

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

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

.7 Ensure emptied containers are sealed and stored safely.

.8 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

.9 Unused paint, caulking, and sealing compound materials must be disposed of at an official hazardous material collections site as approved by Departmental Representative.

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.10 Unused paint, caulking, and sealing compound materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

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

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Plain stainless steel sheet: to ASTM A446, grade A G-90, galvanized steel finish, 0.76 mm minimum thickness. 514.35 mm wide with intermediate ribs with a ventilated ridge cap.

2.2 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Underlay: high temperature sheet bituminous roofing membrane on plywood sheathing.

.3 Sealant: Asbestos-free sealant, compatible with systems materials, recommended by system manufacturer Caulking see Section 07 92 10 - Joint Sealing.

.4 Rubber-asphalt sealing compound.

.5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide, confirm cleat, match existing roof profile. Thickness same as sheet metal being secured.

.6 Fasteners: stainless steel with neoprene stainless steel washers.

.7 Touch-up paint: as recommended by sheet metal roofing manufacturer.

2.3 FABRICATION

.1 Form individual pieces in 2400 mm maximum lengths. Make allowances for expansion at joints.

.2 Hem exposed edges on underside 12 mm, mitre and seal.

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

.4 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

.5 Protect metals against oxidization by backpainting with isolation coating where needed.

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Part 3 Execution

3.1 INSTALLATION

.1 Use concealed fastenings except where approved by Departmental Representative before installation.

.2 Provide underlay under sheet metal roofing. Secure in place and lap joints 100 mm minimum.

.3 Apply slip sheet over high temperature bituminous membrane underlay to prevent bonding between sheet metal and felt. Secure with minimum anchorage and lap joints 50 mm minimum in direction of waterflow.

.4 Install sheet metal roof panels using cleats spaced as approved by manufacturer.

.5 Secure cleats with two fasteners each and cover with cleat tabs.

.6 Align transverse seams in adjacent panels.

.7 Flash roof penetrations with material matching roof panels, and make watertight.

.8 Form seams in direction of water-flow and make watertight.

.9 Follow sheet metal manufacturer's recommendations for soldering procedures.

.10 As work progresses, neutralize excess flux with 5% to 10% washing soda solution, and thoroughly rinse. Leave work clean and free of stains.

3.2 STANDING SEAM ROOFING

.1 Width of the panel is 610 mm, height – 69 mm.

.2 No visible fasteners, except at end laps.

.3 Panel clips: 4 – 4.75 mm with sdt. Slots 2.59 mm material ASTM A446, grade A, G-90, galvanized steel. Fy= 33ksi. 12 mm wide x 6 mm thick butyl caulking tape. End lap stiffener angle, .065 mm ASTM A446, grade A C-90 steel Fy-33ksi.

.4 Apply sheet metal roofing beginning at eaves. Loose lock pans to valley flashing and edge strips at eaves and gable rakes.

.5 Wind Uplift:

.1 UL class 90, ASTM 1592 at purlin spacing of 1500 mm. Passed wind uplift test, UL 1897. Uplift of 6.7 kPa,

3.3 CUSTOM GUTTERS AND DOWNSPOUTS

.1 Form custom box gutter lining with 203 mm x 203 mm gutter, a new prepainted steel .91 mm thick, 1.63 galvanized metal liner, conforming to profile of gutters. 127 x 127

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downspout. See architectural detail. All new gutters and downspouts and all existing gutters and downspouts that will be replaced.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

1.2 REFERENCES

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

.1 ASTM A240/A240M-16a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

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

.2 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual.

.3 Canadian Standards Association (CSA International)

.1 CSA-A440-05/A440.1-05- A440-05, Windows / Special Publication A440.1-05, User Selection Guide to CSA Standard A440-05, Windows.

.2 CSA B111-1974(R2003), 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.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

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

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

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

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

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.6 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

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

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

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

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Electrolytic zinc coated, galvanized, prepainted chromate treated, steel sheet: commercial quality, 0.61 mm thick with proprietary coating comprised of 31.1 kg/m^2 zinc total mass both sides.

.2 Stainless steel sheet: to ASTM A240/A240M, 0.61 mm thick with matte finish, marine grade.

2.2 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied silicone modified polyester.

.1 Pacific Turquoise colour selected by Departmental Representative from manufacturer's standard range.

.2 Specular gloss: 30 units +/- in accordance with ASTM D523. Gloss level to match siding.

.3 Coating thickness: not less than 22 micrometres.

.4 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822 as follows:

.1 Outdoor exposure period 2500 hours.

.2 Humidity resistance exposure period 5000 hours.

2.3 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: asphalt laminated 3.6 to 4.5 kg kraft paper.

.4 Sealants: Exposed: Acrylic co-polymer to CGSB 19GP-5M, one part silicone to CGSB CAN2-19.13.

.5 Cleats: of same material that is recommended by manufacturer.

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.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: stainless steel with neoprene washers.

.8 Solder: to ASTM B32.

.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 galvanized 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, copings and fascias to profiles indicated of 0.61 mm thick galvanized, prepainted galvanized and stainless steel. Cover all exposed wood fascias with prepainted metal cover as detailed.

2.6 REGLETS AND CAP FLASHINGS

.1 Form recessed surface mounted reglets metal cap flashing of 0.61 mm thick stainless steel sheet metal to be built-in concrete masonry work.

Part 3 Execution

3.1 INSTALLATION

.1 Install sheet metal work in accordance with CRCA FL series details, FL ___ Aluminum Sheet Metal Work in Building Construction as detailed.

.2 All flashings to be prepainted galvanized steel with the exception of stainless steel cap flashing at the top of the new masonry block veneer and at the base of the new prepainted corrugated metal siding.

.3 Use concealed fastenings except where approved before installation.

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

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

.6 Lock end joints and caulk with sealant.

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

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

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

.10 Caulk flashing at reglet cap flashing with sealant.

.11 Install pans, where shown around items projecting through roof membrane.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 01 45 00 – Testing Quality Control.

.4 Section 01 61 00 - Common Product Requirements.

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 Department of Justice Canada (Jus)

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

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

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

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

.1 Material Safety Data Sheets (MSDS).

.5 Transport Canada (TC)

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

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.

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.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 QUALITY ASSURANCE/MOCK-UP

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

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

.3 Mock-up will be used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.4 Locate where indicated.

.5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with sealant work.

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

1.5 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.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

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

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

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

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

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

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.7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Departmental Representative.

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

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

1.7 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.

1.8 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

.1 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.

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

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Urethanes Two Part.

.1 Self-Leveling to CAN/CGSB-19.24, Type M, Grade P, colour selected by Departmental Representative. To be used between the building and the sidewalk

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along with appropriate sized ethafoam rod, (extruded closed cell backer rod, size-oversized, 50 to 30% of the joint width), around the entire building.

.2 Silicones One Part.

.1 To CAN/CGSB-19.13, and CGSB 19GP-5M.

.1 Acceptable material: Acrylic co-polymer. Will be used in concrete block, control joint along with ethafoam backer rod (extruded closed cell backer rod, size- oversized, 50 to 30% of the joint width), use a silicone porous primer.

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.

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.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

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