

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 06 10 00 - Rough Carpentry.
- .2 Section 07 62 00 – Sheet Metal Flashings and Trim.
- .3 Section 07 92 00 - Joint Sealing.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
 - .3 ASTM B32-08, Standard Specification for Solder Metal.
 - .4 ASTM D523-14, Standard Test Method for Specular Gloss.
 - .5 ASTM D822/D822M-13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .2 Canadian Sheet Steel Building Institute (CSSBI).
 - .1 CSSBI 10M-08, Standard for Steel Roof Deck
 - .2 CSSBI 20M-08, Standard for Sheet Steel Cladding for Architectural, Industrial and Commercial Building Applications.
 - .3 CSSBI S8-08, Quality and Performance Specification for Prefinished Sheet Steel Use for Building Products.
- .3 Canadian Standards Association (CSA)
 - .1 CSA-S136-12 for Design of Cold Formed Steel Structural Members.
- .4 National Building Code of Canada, 2010 edition.
- .5 New Brunswick Roofing Contractors Association (MRGNB).

1.3 STANDARDS

- .1 Design metal roofing system in accordance with the latest edition of:
 - .1 CSA-S136 for the Design of Cold Formed Steel Structural Members.
 - .2 Canadian Sheet Steel Building Institute (CSSBI) standards -10M, -20M and -S8.
 - .3 National Building Code of Canada, 2010.

1.4 DESIGN REQUIREMENTS

- .1 Match existing sheet metal roof profile, spacing and colour.
- .2 Appearance: neatly and evenly lay out and install components.
- .3 Water control: prevent passage of water.
- .4 Compatibility: components shall be compatible with dissimilar metals and materials with which they are in contact or fastened to so as to prevent corrosion, staining and other detrimental effects. If required, treat or separate contact surfaces with inert and non-staining insulation material to achieve compatibility.

1.5 ACTION AND INFORMATION SUBMITTALS

- .1 Submit action and information submittals in accordance to requirements of 01 33 00 - Submittal Procedures.
- .2 Product data: submit manufacturer's printed product literature, specifications and data sheet, including:
 - .1 Submit WHMIS MSDS - Material Safety Data Sheets. Include product characteristics, performance criteria, and limitations.
- .3 Samples: submit review samples from manufacturer's full range of colours. Submit duplicate 300 x 300 mm samples of material, profile specified, and selected colour.
- .4 Manufacturer's Instructions: Submit manufacturer's installation instructions and installation sequence.
- .5 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.
- .6 Closeout Submittals: submit information in accordance with Section 01 78 00 – Closeout Submittals. Provide maintenance data for cleaning and maintenance of panel finishes for inclusion in manual specified in Section 01 78 00 – Closeout Submittals.

1.6 QUALITY ASSURANCE

- .1 Mock-up: prepare mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .1 Fabricate one roof deviator at location designated by Departmental Representative.
 - .2 Mock-up will be used to judge workmanship, material application and water deviation.
 - .3 Allow for water test with spray hose for Departmental Representative to review that water is positively deflected and does not flow back toward stone wall face. Conduct test as required to achieve positive water flow away from stone wall face.
 - .4 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with work of this Section.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this Work.
 - .6 Approved mock-up may remain as part of finished Work at the sole discretion of the Departmental Representative.
 - .7 If mock-up is not to remain as part of the finished work, remove and dispose of mock-up when no longer required and as directed by Departmental Representative.
- .2 Remedy any defects in work, including work of this and other Sections, due to faults in materials and /or workmanship provided under this Section of Specifications appearing within a period of 5 years from date of Substantial Performance.

1.7 DELIVERY STORAGE AND HANDLING

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

1.8 JOB CONDITIONS

- .1 Schedule and co-ordinate installation of metal flashing components with work of other Sections where it is integral or contiguous therewith.
- .2 Install metal counter and cap flashings immediately after installation and inspection of roofing membrane base flashings.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 – 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 Divert used metal cut-offs from landfill by disposal at the nearest metal recycling facility.
- .5 Divert reusable materials for reuse at nearest used building materials facility.
- .6 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

PART 2 - PRODUCTS

2.1 COMPONENTS

- .1 Plywood Sheathing: as specified in Section 06 10 00 – Rough Carpentry.
- .2 Water Barrier roof membrane: high temperature grade, water barrier roof membrane as follows:
 - .1 High density, cross laminated polyethylene film coated on one side with a layer of butyl rubber or high temperature asphalt adhesive. Provide primer where recommended by water barrier manufacturer.
 - .2 Cold applied, self-adhering membrane.
 - .3 Minimum Thickness: 30 mil.
 - .4 Tensile Strength: ASTM D 412 (Die C Modified); 250 psi.
 - .5 Membrane Elongation: ASTM D412 (Die C Modified); 250%.
 - .6 Permeance (Max): ASTM E96; 0.05 Perms.
 - .7 Flame spread: Class A.
 - .8 Acceptable Products:
 - .1 Ultra, W.R. Grace Company.
 - .2 Blueskin PE 200 HT, Henry.
 - .3 Lastobond Shield "HT" by Soprema.
 - .4 Sharkskin Ultra SA, Kirsch Building Products.
 - .5 or approved equal.

- .3 Sheet Vapour Retarder: SBS modified bitumen membrane, reinforced, slop resistant top surface, self-adhering bottom surface with release paper, minimum thickness of 1.0 mm. Acceptable products:
 - .1 Soprema – “Lastobond Shield”.
 - .2 Henry Company Canada/Bakor – “Bluesjin Roof RF 200 – Ice & Water Barrier”.
 - .3 or other equal approved product.
- .4 Rigid Roof Insulation: polyisocyanurate/urethane rigid roof insulation, to thickness as shown on drawings.
- .5 Clip and Subgirt System:
 - .1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
 - .2 Continuous hat bar and zee clips made from galvanized material, thickness to suit design parameters, to accommodate depth of insulation.
 - .3 Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.
- .6 Prefinished Roof Sheet (exposed to exterior).
 - .1 Profile: batten seam for roof application, profile of battens and spacing to match existing roofing system.
 - .2 Panel: Prefinished steel sheet, Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm.
 - .3 Acceptable Products:
 - .1 Heritage by Ideal Roofing.
 - .2 Tradition 100 by Vicwest.
 - .3 AR-38 Batten by Agway Metal Inc.
 - .4 MRB System by Flynn Canada.
 - .5 or approved equal.

2.2 PANEL FINISHES

- .1 Prefinished steel with factory applied silicone modified polyester.
 - .1 Colour: to match existing metal roofing.

2.3 ACCESSORIES

- .1 Flashing: In accordance with Section 07 62 00 – Sheet Metal Flashings and Trim.
 - .1 Form flashings from same materials as the roof sheet.
 - .2 Custom fabricate to suit architectural details.
- .2 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
- .3 Sealants: In accordance with manufacturer's recommendation and as specified in Section 07 92 00 – Joint Sealing.

2.4 FABRICATION

- .1 Fabricate water deviator and roof components to comply with dimensions, profiles, gauges and details as shown on the drawings, including roof insulation, sheathing, waterproof membranes, panels and all companion flashing.

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

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for the Work of this Section in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Use concealed fastenings except where approved by Departmental Representative before installation.
- .2 Assemble the water deviators assembly as indicated on the drawings and details. Connect to existing roof assembly and make all connections watertight.
- .3 Install sheet metal roof panels using cleats spaced at 460 mm on centre.
- .4 Secure cleats with two fasteners each and cover with cleat tabs.
- .5 Align transverse seams in adjacent panels.
- .6 Flash roof penetrations with material matching roof panels, and make watertight.
- .7 Form seams in direction of water-flow and make watertight.

3.3 CLEAN-UP

- .1 Clean exposed panel surfaces in accordance with manufacturer's written instructions.
- .2 Repair and touch up, with matching colour, minor surface damage, only where permitted by Departmental Representative and to Departmental Representative's satisfaction.
- .3 Replace damaged panels and components that, in opinion of the Departmental Representative, cannot be satisfactorily repaired.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 04 05 00 - Common Work Results for Masonry.
- .2 Section 07 61 00 – Sheet Metal Roofing.
- .3 Section 07 92 00 - Joint Sealing.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM B209-10, Standard Specification for Aluminum and Alloy Sheet and Plate
 - .2 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
- .2 The Aluminum Association Inc. (AAI)
 - .1 AAI-Aluminum Sheet Metal Work in Building Construction-2002.
 - .2 AAI DAF45-03, Designation System for Aluminum Finishes.
- .3 Canadian Standards Association (CSA).
 - .1 CSA A123.3-05(R2010), Asphalt Saturated Roofing Felt.
 - .2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual, 2011 edition.
- .5 SMACNA
 - .1 Architectural Sheet Metal Manual

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Appearance: neatly and evenly lay out and install components.
- .2 Effects of wind: resist positive and negative wind pressures without detrimental effects.
- .3 Water control: prevent passage of water.
- .4 Thermal movement: accommodate expansion and contraction of component parts without buckling, failure of joints, undue stress on fasteners and other detrimental effects.
- .5 Compatibility: components shall be compatible with dissimilar metals and materials with which they are in contact or fastened to so as to prevent corrosion, staining and other detrimental effects. If required, treat or separate contact surfaces with inert and non-staining insulation material to achieve compatibility.

1.4 ACTION AND INFORMATION SUBMITTALS

- .1 Submit product data to Departmental Representative.

- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets.
- .3 Samples:
 - .1 Submit duplicate 100 x 100 mm samples of each type of sheet metal material, finishes and colours specified.

1.5 QUALITY ASSURANCE

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with Departmental Representative and Consultant in accordance to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades, as required.
 - .4 Review manufacturer's installation instructions.
- .2 At no cost to Departmental Representative, remedy any defects in work, including work of this and other Sections, due to faults in materials and /or workmanship provided under this Section of Specifications appearing within a period of 5 years from date of Substantial Performance.

1.6 DELIVERY STORAGE AND HANDLING

- .1 Deliver, store and handle materials as per manufacturer's specification.

1.7 JOB CONDITIONS

- .1 Schedule and co-ordinate installation of metal flashing components with work of other Sections where it is integral or contiguous therewith.
- .2 Install metal counter and cap flashings immediately after installation and inspection of roofing membrane base flashings.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Prefinished Steel Sheet: galvanized sheet steel, 0.032" thick (minimum)/ 24-gauge (minimum) except as otherwise indicated. Pretreated, primed and finish coated with nominal coating thickness of not less than 22 micrometres; polymerized silicone, colour to match existing standing seam roof colour. Acceptable material as manufactured by:
 - .1 VicWest Steel.
 - .2 Flynn Canada Limited.
 - .3 Agway Metals Inc.
 - .4 Or equivalent product by other manufacturers.
- .2 Galvanized Sheet Steel: Hot dip galvanized, cold rolled with stretcher level degree of flatness to ASTM A653/A653M with zinc coating designation Z275.

- .3 Cleats and Edge Strips: of same material and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured and as required to provide rigid support and positive securement for metal flashings.
- .4 Reglets and Counter-flashings: Shall be prefabricated, 24-gauge with factory mitered corners.
 - .1 Provide continuous foam backer rod and elastomeric sealant where shown.
- .5 Fasteners: Non-corrosive, of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for application.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .7 All Exterior Installations: use stainless steel, complete with stainless steel nuts and washers, unless otherwise indicated.
- .8 Masonry anchors / self tapping screw anchors: Tapcon.
- .9 Surface fasteners: nylon headed screws of same material as sheet metal. Colour to match metal flashing.
- .10 Sealant: as specified in Section 07 92 00 – Joint Sealing.
- .11 Isolation Coating: Alkali resistant asphalt based enamel to CAN/CGSB-1.108.
- .12 Underlayment Type 1: Water Barrier (underlayment and slip sheet), high temperature grade, water barrier roof membrane as follows:
 - .1 High density, cross laminated polyethylene film coated on one side with a layer of butyl rubber or high temperature asphalt adhesive. Provide primer where recommended by water barrier manufacturer.
 - .1 Cold applied, self-adhering membrane.
 - .2 Minimum Thickness: 30 mil.
 - .3 Tensile Strength: ASTM D 412 (Die C Modified); 250 psi.
 - .4 Membrane Elongation: ASTM D412 (Die C Modified); 250%.
 - .5 Permeance (Max): ASTM E96; 0.05 Perms.
 - .6 Flame spread: Class A.
 - .7 Acceptable Products:
 - 1. Ultra, W.R. Grace Company.
 - 2. Blueskin PE 200 HT, Henry.
 - 3. Sharkskin Ultra SA, Kirsch Building Products.
 - 4. or approved equal.
- .13 Plastic Cement: to CAN/CGSB 37.5.
- .14 Wood furring, blocking, nailing strips, grounds and rough bucks, cants, curbs and fascia backing:
 - .1 Board sizes: "Standard" or better grade.
 - .2 Dimension sizes: "Standard" light framing or better grade.

- .15 Wood sheathing: Douglas fir plywood (DFP): to CSA 0121, standard construction, square edge, urea-formaldehyde free, thickness as indicated on drawings and details.
 - .1 Canadian Softwood Plywood (CSP) to CSA O151, unsanded, sheathing grade, square edge, urea-formaldehyde free, thickness as indicated on drawings and details.
 - .2 VOC limits to SCAQMD Rule 1168
- .16 Touch-up paint: as recommended by prefinished material manufacturer.
 - .1 Maximum VOC limit to SCAQMD Rule 1113.

2.2 FINISHES

- .1 Exposed surfaces: Prefinished steel with factory applied silicone modified polyester.
 - .1 Colour, as directed by Departmental Representative, to match existing prefinished metal roofing.
 - .2 Provide colour samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Concealed surfaces: galvanized.

2.3 FABRICATION GENERAL

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable MRGNB details, SMACNA Architectural Manual, and as indicated.
- .2 Shop fabricate metal flashing components to profiles indicated where flashings are required but not detailed follow applicable requirements of SMACNA Architectural Manual. Provide minimum metal gauge of 0.76 mm thickness (22-gauge) sheet material for all components unless otherwise indicated.
- .3 Form pieces in 3.0 m maximum lengths. Make allowance for expansion at joints. Provide slotted fixing holes and steel / plastic washer fasteners.
- .4 Form sections square, true and accurate to size, free from distortion, waves, twists, buckles and other defects detrimental to performance and appearance.
- .5 Hem exposed edges on underside minimum 12 mm. Mitre and seal corners with sealant.
- .6 Seams: space seams uniformly at maximum 3.0 m on centre (o.c.). Make allowance for expansion at joints. Unless otherwise indicated, use flat locked seams, lapped 25 mm. Make horizontal seams in directions of water flow.
- .7 Unless otherwise indicated, counter flashings shall completely cover base flashings.
- .8 Furnish everything necessary for complete metal flashing installation, including clips and fastening devices.
- .9 Apply isolation coating to metal surfaces in contact with concrete or mortar.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install sheet metal work in accordance with MRGNB "MBFL" series details, SMACNA Architectural Manual and as indicated.
- .2 Provide metal flashings where indicated on drawings.
- .3 Protect all bituminous membrane flashings with metal counterflashings.
- .4 Clean surfaces to be covered with metal flashings of dirt and other foreign matter. Do not apply metal flashings over substrates likely to cause rupture.
- .5 Install underlay under metal flashings over masonry or wood. Lay underlay dry as sheet metal work is installed. Secure in place and lap joints 100 mm.
- .6 Surface fasten flashings to supporting building elements with 31 mm long nylon headed screws at 600 mm o.c. maximum. Provide slotted fixing holes and aluminum / plastic washer fasteners.
- .7 Fill and seal seams with sealant; rivet corners.
- .8 Where flashing is punctured by bolts, provide sheet lead or neoprene washers, 6 mm larger than bolt hole.
- .9 Counterflash membrane flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips, as detailed. Make horizontal seams in direction of water flow.
- .10 Imperfections in metal flashing work such as holes, dents, creases, or oil-canning will not be accepted.
- .11 Lock end joints and caulk with sealant.

3.2 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Leave work area's clean, free from grease, finger marks and stains.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 04 03 07 – Historic Masonry Repointing and Repair.
- .2 Section 04 05 00 - Common Work Results For Masonry.
- .3 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM):
 - .1 ASTM C834-14, Standard Specification for Latex Sealants.
 - .2 ASTM C920-14a, Standard Specification for Elastomeric Joint Sealants.
- .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 SUBMITTALS

- .1 Submit product data to Departmental Representative:
 - .1 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.
 - .2 Submit two copies of WHMIS MSDS Material Safety Data Sheets for each type of sealant and primer. Indicate VOC content.
- .2 Submit samples to Departmental Representative:
 - .1 Submit duplicate samples of each type of material and colour.
 - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .3 Submit manufacturer's instructions to Departmental Representative. Instructions to include installation instructions for each product used.

1.4 MOCK-UPS AND TESTS

- .1 Construct mock-ups in accordance with Section 01 45 00 – Testing and Quality Control.
- .2 Construct a mock-up of each of the following sealant applications:
 - .1 Cornice flashing at interface with masonry (reglet).
 - .2 Metal roof edge at interface with masonry.
 - .3 Caulked masonry joints for each type of stone used in the project. Adhesion tests to be performed on each type of stone.

- .3 Each mock-up shall consist of minimum 1.5 linear metres of sealant joint, located where directed by the Departmental Representative.
- .4 Allow 24 hours for review of mock-up by Departmental Representative before proceeding with sealant work.
- .5 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished Work. Remove mock-up and dispose of materials when no longer required and when directed by Departmental Representative.

1.5 QUALITY ASSURANCE

- .1 Use only sealants which are proven to be compatible with materials they are in contact with. Notify Departmental Representative prior to start of sealant work should any sealant specified be considered unsuitable for the purpose intended.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with manufacturer's instructions.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.
- .3 Store materials in a dry area having an ambient temperature within limitations recommended by material manufacturer.

1.7 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets 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 Unless otherwise specified, apply sealants when air temperature is between 10°C and 25°C. When air temperature is above 25°C or below 10°C follow sealant manufacturer's recommendations regarding application.
- .4 Ventilate area of Work in accordance with manufacturer's material safety data sheets.

1.8 PROJECT CONDITIONS

- .1 Environmental Limitations:
 - .1 Do not proceed with installation of joint sealants under following conditions:
 - .2 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees °C.
 - .3 When joint substrates are wet.
- .2 Joint-Width Conditions:
 - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling.
- .4 Identify hazardous and related materials which cannot be reused, are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional Levels of Government.
- .5 Safely store materials defined as hazardous or toxic waste, including emptied containers and application apparatus, in containers or areas designated for hazardous waste and dispose of contaminants in an approved legal manner.
- .6 Place materials defined as hazardous or toxic in designated containers.
- .7 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .8 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.
- .9 Divert unused joint sealing material from landfill to official hazardous material collections site approved by the Departmental Representative.
- .10 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.
- .11 Fold up metal banding, flatten, and place in designated area for recycling.

1.10 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 °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.

1.11 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 the Departmental Representative by use of approved portable supply and exhaust fans.

1.12 WARRANTY

- .1 At no cost to Owner, Contractor to remedy any defects in work, including work of this and other Sections, due to faults in materials and /or workmanship provided under this Section appearing within a period of two (2) years from date of Substantial Performance.

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 off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 MATERIALS / SEALANT DESIGNATIONS

- .1 Sealant Type A: Silicone, low modulus, high performance, one part, neutral curing, non-staining, construction grade, to CAN/CGSB-19.13. Colour to match adjacent finishes to the approval of the Departmental Representative. Acceptable material: #790 – Silicone Building Sealant by Dow Corning, SikaSil-C990 by Sika Canada Inc., or approved equal.
- .2 Sealant Type B: Silicone, low modulus, high performance, one part, neutral curing, non-staining, construction grade, to CAN/CGSB-19.13. Colour to match adjacent finishes to the approval of the Departmental Representative. Acceptable material: #795 – Silicone Building Sealant by Dow Corning, SikaSil-C995 by Sika Canada Inc., or approved equal.
- .3 Colours: to be selected by Departmental Representative from manufacturer's standard colours for each installation type and/or sealant type. Colours to match existing condition, as required.
- .4 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
- .5 Primers, thinners: as recommended by sealant manufacturer, non-staining type.

2.3 ACCESSORIES

- .1 Preformed Compressible and Non-Compressible back-up materials, compatible with sealant:
 - .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/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .4 Bond Breaker Tape:
 - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.4 JOINT CLEANER

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

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine joints to be caulked and report in writing to the Departmental Representative any defects in work of other Sections which would impair installation, performance and warranty of sealants.
- .2 Do not commence installation of sealants until conditions are acceptable.
- .3 Start of work implies acceptance of conditions.

3.2 PROTECTION

- .1 Protect installed Work of other trades from staining or contamination.
 - .1 Repair any damage caused by sealants.

3.3 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.
- .6 Prepare porous surfaces such as masonry and concrete to sealant manufacturer's specifications.

3.4 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.

3.5 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.

3.6 MIXING

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

3.7 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.

3.8 CLEANING

- .1 Clean adjacent surfaces immediately and leave work neat and clean. Use cleaning method recommended by manufacturer.
- .2 Remove excess and droppings, using recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.

3.9 SEALANT SCHEDULE

- .1 Apply sealant Type "A" at the following exterior locations:
 - .1 Between dissimilar (porous) materials in exposed locations except where specifically indicated otherwise.
 - .2 At all perimeters of non-porous to porous materials (i.e. metal flashing / roofing and stone masonry).
 - .3 Sealant joints in exterior surfaces of stone masonry, including new drip edges.
 - .4 and where indicated on drawings.
- .2 Apply sealant Type "B" at the following exterior locations:
 - .1 Between dissimilar (non-porous) materials in exposed locations except where specifically indicated otherwise.
 - .2 Perimeters of non-porous materials (metal to metal joints, metal flashings and other non-porous materials, etc.).
 - .3 Exterior joints in sheet metal work, including sheet metal flashing, and where not otherwise specified.
 - .4 and where indicated on drawings.

END OF SECTION