

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 03 01 30 – Concrete Repairs.
- .2    Section 04 05 10 - Common Work Results for Masonry.
- .3    Section 07 92 00 - Joint Sealants.

**1.2                REFERENCES**

- .1    American Society for Testing and Materials International (ASTM)
  - .1    ASTM A167-99(2004), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2    ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .3    ASTM A606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
  - .4    ASTM B32-04, Standard Specification for Solder Metal.
- .2    Canadian Copper & Brass Development Association (CCBDA).
  - .1    Copper in Architecture Handbook, 1995.
- .3    Canadian Roofing Contractors Association (CRCA)
  - .1    Roofing Specifications Manual 1997.
- .4    Canadian General Standards Board (CGSB)
  - .1    CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
  - .2    CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
- .5    Canadian Standards Association (CSA International)
  - .1    CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.
  - .2    CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .6    Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1    Material Safety Data Sheets (MSDS).
- .7    Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
  - .1    Architectural Sheet Metal Manual.
- .8    Specialty Steel Industry of North America (SSINA)
  - .1    Designer Handbook: Standard Practices for Stainless Steel Roofing, Flashing, Copings.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .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 Shop Drawings:
  - .1 Shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Coordinate with Div 03 and Div 04.
  - .3 Provide shop drawings for all fabrications including showing patterns, connection details, fastening, profiles, sequence of installation.
- .4 Samples:
  - .1 Submit three samples of each type of sheet metal material, finishes and colours.
  - .2 Submit three full size samples of each profile and part.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
  - .2 Submit data on sheet metal fabricator.
  - .3 Prepare staged mock-ups for each type of installation including each type of concrete cap flashing, Sally Port pediment, and ledge flashing.

#### **1.4 QUALITY ASSURANCE**

- .1 Sheet metal fabricator and installer to have minimum of 10 years experience in this type of work.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative and Departmental Representative in accordance with Section 01 00 10 General Instructions to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 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.

### **Part 2 Products**

#### **2.1 SHEET METAL AND METAL MATERIALS**

- .1 Stainless steel sheet: to ASTM A167, ASTM A240/A240M, Type 316L with 2B finish.
  - .1 Nominal, 1.6 mm thick.
  - .2 Fully annealed temper.

#### **2.2 ACCESSORIES**

- .1 Wood and plywood: solid wood and exterior grade plywood, location and size as indicated.
- .2 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32, No. 15 perforated asphalt felt to CSA A123.3.

- .3 Sealants: in accordance with Section 07 92 00 - Joint Sealants or as recommended by the manufacturer.
- .4 Cleats: of same material and temper as sheet metal, minimum 50 mm wide. Thickness to be the same as the sheet metal being secured.
- .5 Fasteners: stainless steel.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .7 Lead wedges.
- .8 Flux, solders and welding : suitable for materials to be soldered and/or welded.

### **2.3 FABRICATION**

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable SSINA - Designer Handbook: Standard Practices for Stainless Steel Roofing, Flashing, Copings, SMACNA - Architectural Sheet Metal Manual, supplemented by guidance in CCBDA - Copper in Architecture Handbook and CRCA - Roofing Specifications Manual, and as indicated.
  - .2 Form pieces in maximum lengths.
    - .1 Make allowance for expansion at joints.
  - .3 Hem exposed edges on underside 12 mm.
    - .1 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 Solder and/or welding assemblies together, use lock joints and hidden fasteners to minimize soldering.
- 2.4 Form flashings and copings to profiles indicated including concret ecap flashings, Sally Port Pediment and ledges.

### **Part 3 Execution**

#### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### **3.2 INSTALLATION**

- .1 Review and record site conditions to prepare shop drawings.
- .2 Coordinate with work with Div 03 and Div 04.
- .3 Prepare mock-ups fo reach type of installaiton and have reviewe and accepted by the Departmental Representative before proceeding with the work.
- .4 Install sheet metal work in accordance with best sheet metal practice indicated in SSINA - Designer Handbook: Standard Practices for Stainless Steel Roofing, Flashing, Copings, SMACNA - Architectural Sheet Metal Manual, supplemented by guidance in CCBDA - Copper in Architecture Handbook and CRCA - Roofing Specifications Manual, and as indicated.
- .5 Use concealed fastenings except where approved before installation.
- .6 Provide underlay under sheet metal.
  - .1 Secure in place and lap joints 100 mm.
- .7 Lock end joints and caulk with sealant.

- .8 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
- .9 Insert metal flashing into reglets under cap flashing to form weather tight junction.
- .10 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.
- .11 Caulk flashing at reglet cap flashing with sealant.

**3.3 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .2 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
  - .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 WHMIS MSDS.
- .3 Samples:
  - .1 Submit 3 samples of each type of material and colour.
  - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .4 Manufacturer's Instructions:
  - .1 Submit instructions to include installation instructions for each product used.
  - .2 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

**1.3 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

## **1.5 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 Proceed with installation of joint sealants only when:
    - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
    - .2 Joint substrates are dry.
    - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
  - .2 Joint-Width Conditions:
    - .1 Proceed with installation of joint sealants only where joint widths are those allowed by joint sealant manufacturer for applications indicated.
  - .3 Joint-Substrate Conditions:
    - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.
    - .2 Use primers as indicated by the manufacturer.

## **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 Health Canada.
- .2 Ventilate enclosed area of work by use of approved portable supply and exhaust fans.

## **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 SEALANT MATERIAL DESIGNATIONS**

- .1 Type 1: Polyurethane one part:
  - .1 For use on vertical and horizontal joints: to CAN/CGSB-19.13, Type 1, colour selected from manufacturer's standard range.
- .2 Preformed compressible and non-compressible back-up materials:
  - .1 Polyethylene, urethane, neoprene or vinyl foam:
    - .1 Extruded closed cell foam backer rod. 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<sup>3</sup> 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.
- .3 Weep Tubes for control joints:
  - .1 Nominal 100mm lng x 10mm diameter.
  - .2 Opaque plastic walls.
  - .3 Cotton Wick.
  - .4 Stainless steel screen.
- .4 Primer: As recommended by the sealant manufacturer.

### **2.3 SEALANT SELECTION**

- .1 Use sealant at control joints, flashing joints, junctures of dissimilar materials and as indicated.

### **2.4 JOINT CLEANER**

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation 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.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative .

### **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 Install weep tubes at bottom of control joints.
- .3 Curing:
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

**3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.Clean adjacent surfaces immediately.
  - .2 Remove excess and droppings, using recommended cleaners as work progresses.
  - .3 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management.

**3.8 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

**END OF SECTION**