

1 GENERAL

1.01 GENERAL REQUIREMENTS

- .1 Materials, preparation, and application procedures for caulking and sealants as required, shown, or specified for this project.
- .2 Text to complete other various Sections containing sealant or caulking specifications.
- .3 Refer to other sections for caulking and sealants requirements contained therein.
- .4 Joint sealant as shown or specified including, but not restricted to, the following:
  - .1 Perimeter joints of exterior and interior hollow-metal doors, aluminum doors, specialty doors, windows, curtain walls, louvers, and screen frames.
  - .2 Exposed control joints and expansion joints in masonry, concrete units, composite wall panels, paving slabs, and concrete walls.
  - .3 Raked joints at masonry wall junction and masonry to dissimilar material junctions.
  - .4 Interior and exterior exposed joints, between dissimilar materials not concealed from view.
  - .5 Full length of exterior door saddles and floor control joints.
  - .6 Perimeter joints between metal studs and gypsum-board sheathing at acoustically insulated walls.
  - .7 Joints between urinals and wall, and between water closets and floor.
  - .8 Joints at top of all wood bases, wood trims, counters, and cabinets.
  - .9 Waterproof sealants application at ceiling to wall interface at underside of exterior cast-in-place staircase.
  - .10 Caulking in connection with roof flashings and curbs.
  - .11 Caulking between members of aluminum windows.
  - .12 Caulking in connection with gypsum-board partitions, and polyethylene vapour-retarder.
  - .13 Caulking in conjunction with GFRC systems.
  - .14 Joints between cast-in-place floor slabs/walls.
  - .15 Penetrations of cast-in-place floor slabs.
  - .16 Joints in non-rated fire separations where only smoke seal in required.
  - .17 Joints between metal door frames and floor.

1.02 RELATED REQUIREMENTS

- .1 Firestopping – Refer to Drawings.
- .2 Section 09 01 00 – Finishes Repair.
- .3 Section 09 30 13 – Ceramic Tiling.
- .4 Section 13 11 46 – Swimming Pool Accessories.
- .5 Division 26 – Electrical.

1.03 REFERENCE STANDARDS

- .1 ASTM International
  - .1 ASTM C 919-08, Standard Practice for Use of Sealants in Acoustical Applications.

- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 General Services Administration (GSA) - Federal Specifications (FS)
  - .1 FS-SS-S-200-E(2)1993, 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 South Coast Air Quality Management District (SCAQMD), California.

#### 1.04 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 two (2) copies of WHMIS MSDS.
- .3 Samples:
  - .1 Submit two (2) 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.

#### 1.05 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.

#### 1.06 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 indoors, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect joint sealants from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return of pallets, crates, and packaging materials, as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

#### 1.07 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° Celsius.
    - .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 more than 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.
- .4 Protect adjacent work from contamination due to mixing, handling, and application.

#### 1.08 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 The Departmental Representative will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants. Ventilate area of work as directed by Departmental Representative, by use of approved portable supply and exhaust fans.

#### 1.09 QUALITY ASSURANCE/MOCK-UP(S)

- .1 Construct mock-up(s) in accordance with Section 01 45 00 – Quality Control.
- .2 Construct mock-up(s) to show location, size, shape, and depth of joints, complete with back-up material, primer, caulking, and sealant.

- .3 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment, and material application.
- .4 Locate where directed.
- .5 Allow twenty-four (24) hours for inspection of mock-up(s) by Departmental Representative, before proceeding with sealant work.
- .6 When accepted, mock-up(s) will demonstrate the minimum standard of quality required for this work. Approved mock-up(s) may remain as part of finished work.

#### 1.10 WARRANTY

- .1 Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion, or stain adjacent surfaces for 4 years after expiration of the standard one-year warranty.
- .2 Defective work shall include, but not be restricted to, joint leakage, hardening, cracking, crumbling, melting, bubbling, shrinkage, running, change of colour, loss of adhesion, loss of cohesion, or staining of adjoining work surfaces. Replace sealant materials which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or which do not cure.
- .3 Replacement shall include removal of defective materials, preparation and application of new material, and the repair and making good of damaged adjacent work.

## 2 PRODUCTS

### 2.01 SEALANT MATERIALS

- .1 Sealant and caulking compounds must:
  - .1 Meet or exceed all applicable governmental and industrial safety and performance standards.
  - .2 Be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, bylaws, and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act (CEPA).
- .2 Sealant and caulking compounds must not be formulated or manufactured with aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium, or their compounds, except barium sulphate.
- .3 Sealant and caulking compounds must be accompanied by detailed instruction for proper application, so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
- .4 Sealants acceptable for use on this project must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants.
- .5 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .6 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.

- .7 Where sealants are qualified with primers use only these primers.

## 2.02 SEALANT MATERIAL DESIGNATIONS

- .1 Polysulfide two part:
  - .1 Self-levelling to CAN/CGSB-19.24-M90, Type 1, Class B, colour to be selected.
- .2 Polysulfide two part:
  - .1 Non-sag: to CAN/CGSB-19.24-M90, Type 2, Class B, colour to be selected.
- .3 Polysulfide one part:
  - .1 Self-levelling: to CAN/CGSB-19.13-M87, MC-1-40-B-N/MC-1-25-B-N, colour to be selected.
- .4 Polysulfide one part:
  - .1 Non-sag: to CAN/CGSB-19.13-M87, MC-2-40-B-N/MC-2-25-B-N, colour to be selected.
- .5 Urethanes two part:
  - .1 Self-levelling: to CAN/CGSB-19.24-M90, Type 1, Class B, colour to be selected.
- .6 Urethanes two part:
  - .1 Non-sag: to CAN/CGSB-19.24-M90, Type 2, Class B, colour to be selected.
- .7 Urethanes one part:
  - .1 Self-levelling: to CAN/CGSB-19.13-M87, Type 1, colour to be selected.
- .8 Urethanes one part:
  - .1 Non-sag: to CAN/CGSB-19.13-M87, Type 2, MCG-2-25/MCG-2-40, colour to be selected.
- .9 Silicones one part: Mildew resistant, to CAN/CGSB-19.13-M87.
- .10 Acrylics one part: to CGSB 19-GP-5M.
- .11 Acrylic latex silicone siliconized, one part, paintable: to CAN/CGSB-19.17-M90.
- .12 Acoustical sealant: to ASTM C 919-12.
- .13 Preformed compressible and non-compressible back-up materials:
  - .1 Polyethylene, urethane, neoprene or vinyl foam:
    - .1 Extruded closed cell foam backer rod.
    - .2 Size: oversize 30% to 50%.
  - .2 Neoprene or butyl rubber:
    - .1 Round solid rod, Shore A hardness 70.
  - .3 High density foam:
    - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m<sup>3</sup> density, or neoprene foam backer, size as recommended by manufacturer.
  - .4 Bond breaker tape:

- .1 Polyethylene bond breaker tape that will not bond to sealant.

## 2.03 SEALANT SELECTION

- .1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry). Sealant type: Urethane, one-part, non-sag.
- .2 Expansion and control joints in exterior surfaces of poured-in-place concrete walls. Sealant type: Urethane, two-part, non-sag.
- .3 Expansion and control joints in exterior surfaces of precast, architectural wall panels. Sealant type: Urethane, two-part, non-sag.
- .4 Control and expansion joints in exterior surfaces of unit masonry walls. Sealant type: Urethane, two-part, non-sag.
- .5 Seal interior perimeters of exterior openings. Sealant type: Acrylic latex, one-part.
- .6 Control and expansion joints on the interior of exterior poured-in-place concrete walls. Sealant type: Urethane, two-part, non-sag.
- .7 Control and expansion joints on the interior of exterior surfaces of unit masonry walls. Sealant type: Urethane, two-part, non-sag.
- .8 Interior control and expansion joints in floor surfaces. Sealant type: Polysulphide, two-part, self-levelling.
- .9 Perimeters of interior frames. Sealant type: Acrylic latex.
- .10 Interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls). Sealant type: Urethane, two-part, non-sag.
- .11 Joints at tops of non-load bearing masonry walls at the underside of poured concrete. Sealant type: Urethane, two-part or one-part, non-sag.
- .12 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, water closets, basins, vanities). Sealant type: Silicone, one-part, mildew resistant. Use primer, as required, for plastic-laminate tops.
- .13 Penetrations through air-vapour barrier.
- .14 Between pressed-steel interior door frames and masonry gypsum-board walls.
- .15 Perimeter joints, penetrations, and openings in drywall partitions and penetration in masonry walls.
- .16 Perimeter penetrations, openings in acoustically rated walls: Acoustical sealant per CGC Gypsum Construction Handbook.
- .17 Unless indicated otherwise, unrated fire separations are to be provided in the following locations:
  - .1 All service rooms not requiring one-hour fire separations.
  - .2 Storage rooms.

## 2.04 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.

## 3 EXECUTION

### 3.01 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.
- .2 Ascertain that sealers and coatings applied to sealant substrates are compatible with the sealant used, and that full bond between sealant and substrate is attained. Request samples of the sealed or coated substrate from their fabricators, for testing of compatibility and bond, if necessary.

### 3.02 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 that 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 that joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.
- .6 Protect installed work of other trades from staining or contamination.
- .7 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.
- .8 Ensure that joint surfaces are dry and frost free. The surfaces of joints to receive sealant or caulk shall be free of all frost, condensation, and moisture. Oil, grease, dirt, chalk, particles of mortar, dust, loose rust, loose mill scale, and other foreign substances shall be removed from surfaces of joints to be in contact with the sealant. Oil and grease shall be wiped dry with clean cloths. For surface types not listed below, the sealant manufacturer shall be contacted for specific recommendations.

- .9 Verify that specified environmental conditions are ensured before commencing work.
- .10 Defective work, resulting from application to unsatisfactory joint conditions, will be considered to be the responsibility of those performing the work of this section.
- .11 Remove by brushing, scrubbing, scraping, or grinding loose, all mortar, dust, oil, grease, oxidation, mill scale, coatings, and all other materials affecting the bond of compounds to surfaces to which sealant compounds must adhere, except for painted surfaces.
- .12 Clean down caulked metal surfaces with clean cellulose sponges, or rags soaked in solvent recommended by sealant manufacturer, and wipe dry with clean cloths. Ensure that solvent is not injurious to painted surfaces.
- .13 Ensure that releasing agents, coatings, or other treatments have either not been applied to joint surfaces, or that they are entirely removed.

### 3.03 CONCRETE AND MASONRY SURFACES

- .1 Where surfaces have been treated with curing compounds, oil, or by other such materials, the materials shall be removed by sandblasting or wire brushing. Laitance, efflorescence, and loose mortar shall be removed from the joint cavity.

### 3.04 STEEL SURFACES

- .1 Steel surfaces, to be in contact with sealant, shall be sandblasted or, if sandblasting would not be practical or would damage adjacent finish work, the metal shall be scraped and wire brushed to remove loose mill scale. Protective coatings on steel surfaces shall be removed by sandblasting, or by a solvent that leaves no residue.

### 3.05 ALUMINUM SURFACES

- .1 Aluminum surfaces in contact with sealants shall be cleaned of temporary protective coating. When masking tape is used for a protective cover, the tape, and any residual adhesive, shall be removed just prior to applying the sealant. Solvents used to remove protective coating shall be as recommended by the manufacturer of the aluminum work, and shall be non-staining.

### 3.06 WOOD SURFACES

- .1 Wood surfaces to be in contact with sealants shall be free of splinters and sawdust and other loose particles.

### 3.07 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.

### 3.08 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.

3.09 MIXING

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

3.10 APPLICATION

- .1 Include in work of this section all caulking, except where specified under the work of other sections, to make the work complete, as indicated typically on Drawings, and as otherwise specified.
- .2 Masking tape shall be placed on the finish surface, on one or both sides of a joint cavity, to protect adjacent finish surfaces from primer or sealant smears. Masking tape shall be removed within ten (10) minutes after the joint has been filled and tooled.
- .3 Prime surfaces to receive sealants, as required by substrate and manufacturer's specifications, to ensure positive and permanent adhesion, and to prevent staining.
- .4 Pack joints tightly with sealant backing, at depth specified for sealant. Fill other voids with filler, to correct depth and shape, with approximately 30% compression.
- .5 Install sealant in joints to depths conforming to the following:
  - .1 6 mm for joints up to 13 mm.
  - .2 9 mm to 13 mm for joints between 19 mm and 25 mm wide.
  - .3 19 mm for joints 25 mm wide.
  - .4 In non-porous materials, such as metal and glass, and between metal and concrete, install sealant to depth of not less than 6 mm, and joint width of not less than 6 mm.
- .6 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 Install acoustic caulking at perimeter of drywall partitions, at the perimeter edge of each sheet; wall penetrations for electrical outlets; plumbing, heating, and air-conditioning ducts; and telephone and data hook-ups. Install 6 mm bead to 3 mm joint/relief perimeters, or at 2:1 ratio bead to joint thickness. Also install at control joints, partition intersection openings, and miscellaneous receptacles. Apply 13 mm diameter bead of acoustic sealant continuously around the periphery of each face of partitioning, seal gypsum-board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, duct penetrations, in partitions where perimeter sealed with acoustic sealant. Review current CGC Gypsum Construction Handbook Acoustic Caulking Application Guide, with the Departmental Representative.
  - .8 Tool exposed surfaces before skinning begins to give slightly concave shape.
  - .9 Remove excess compound promptly as work progresses and upon completion.
- .7 Curing:
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

### 3.11 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Clean adjacent surfaces immediately.
  - .3 Remove excess and droppings, using recommended cleaners as work progresses.
  - .4 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 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .4 Remove masking tape after initial set of sealant. Ensure that the General Contractor's Construction Manager is notified of freshly-applied sealant locations, and that signage is posted to avoid damage by other Trades.

### 3.12 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