1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 - Cast-In-Place Concrete.
.2 Section 06 08 99 - Rough Carpentry for Minor Works.
.3 Section 06 20 00 - Finish Carpentry.
.4 Section 07 84 00 - Firestopping.
.5 Section 08 31 00 - Access Doors & Panels.
.6 Section 08 50 00 - Windows.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
  .1 ASTM C 321 - Standard Test Method for Bond Strength of Chemical- Resistant Mortars.
  .2 ASTM C 834 - Standard Specification for Latex Sealants.
  .3 ASTM C 882 - Standard Test Method for Bond Strength of Epoxy-R Systems used with Concrete by Slant Shear.
  .4 ASTM C 919 - Standard Specification for use of Sealants in Acoustical Applications.
  .5 ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
  .6 ASTM C 1330 - Standard Specification for Cylindrical Sealant Backing for use with Cold Liquid Applied Sealants.
  .7 Sealants and associated materials must conform with the latest version of standards and specifications referenced.
.2 Transport Canada (TC)
  .1 Transportation of Dangerous Goods Act (TDGA).
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-19.21, Sealing and Bedding Compound Acoustical.
.4 Department of Justice Canada (Jus)
  .1 Canadian Environmental Protection Act, (CEPA).
.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
  .1 Caulking Compound.
  .2 Primers.
  .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
  .4 Installation instructions, surface preparation and product limitations.
.2 Manufacturer's Technical Data Guides and application procedures.
.3 Submit cured samples illustrating colors selected.
.4 Submit laboratory tests or data validating product compliance with performance criteria specified. Include SWRI validation certificate where required.
.5 Upon completion of the project the sealant applicator must submit copies of the Manufacturer's Weatherseal and the Warranty Applicator's Workmanship Warranty.
.6 Before proceeding with work or ordering of material submit the following to the Departmental Representative for review and acceptance:
  .1 Manufacturer's product data for sealants to be used.
  .2 Manufacturer's recommended installation procedures.

.7 Material Safety Data Sheets:
  .1 Submit MSDS for inclusion in Operation and Maintenance Manual.

1.4 FIELD ADHESION / COHESION TESTS

.1 Test Frequency:
  .1 Perform a field test for each type of sealant and substrate combination, for all interior and exterior sealants associated with the building envelope.
  .2 Perform three (3) additional tests for each failed test.

.2 Locate test joints as directed by Departmental Representative. Tests to be performed in the presence of the Departmental Representative and/or manufacturer's representative.

.3 Notify Departmental Representative seven (7) days prior to dates tests are to be performed.

.4 Test joint sealants by hand-pull methods #1 and #2. Record results in Field Adhesion / Cohesion Test Form.
  .1 Test Method #1:
    .1 Make a knife cut horizontally from one side of the joint to the other.
    .2 Make two (2) vertical cuts (from the horizontal cut) approximately 75mm long on each side of the joint.
    .3 Pry out flap created from cuts.
    .4 Firmly grasp flap and slowing pull at 90 degrees from sealant plane.
    .5 Pull flap until adhesive or cohesive failure occurs.
      .1 Adhesive failure will be evidenced by the sealant pulling off clean from the substrate.
      .2 Cohesion failure will be evidenced by the sealant ripping or failing within itself, leaving well-adhered sealant to the substrate, (cohesive failure is considered a positive result).
  .2 Test Method #2:
    .1 Follow steps #1 to #4 (inclusive) of Test Method #1 above.
    .2 Mark a benchmark on the sealant, 25mm from the plane of the installed sealant.
    .3 Firmly grasp the flap and pull slowly, while holding a ruler parallel to the sealant flap. Note the position of the benchmark on the ruler.
    .4 Refer to manufacturer's printed literature for each sealant tested for the required extension factor pass criteria; (i.e. if the 25mm benchmark on the sealant can be pulled to 100mm and held with no failure of sealant, 400% elongation is achieved).
    .5 If no failure occurs prior to the manufacturer's stated extension factor, the test is successful. Extension factor should be three (3) times the movement capability of the sealant.

.5 Inspect joints for:
  .1 Complete fill.
  .2 Absence of voids.
  .3 Primer.
  .4 Proper width / depth ratio.
  .5 Backup material.

.6 Repair sealants pulled in test area by applying new sealants following same procedures used to original seal joints.

.7 Contactor shall repair test areas at no additional cost to the Departmental Representative.

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 products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets (MSDS) for each product.
.3 Store products in location protected from freezing, damage, construction activity, precipitation and direct sunlight in strict accordance with manufacturer's recommendations.
.4 Condition products to approximately 16 to 21 degrees C, for use in accordance with manufacturer's recommendations.
.5 Handle all product with appropriate precautions and care as stated on Material Safety Data Sheet (MSDS).

1.6 PROJECT CONDITIONS

.1 Do not use products under conditions of precipitation or freezing weather. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.
.2 Ensure substrate is dry.
.3 Protect adjacent work from contamination due to mixing, handling and application.
.4 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.
.5 Joint-Substrate Conditions:
.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL 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 (MSDS) acceptable to Labour Canada.

1.8 WARRANTY

.1 Provide manufacturer's five (5) year standard material warranty.
.2 Include coverage for replacement of sealant materials which fail to achieve water tight seal, exhibit loss of adhesion or cohesion, or do not cure.
.3 Warranty Exclusions: Failure resulting from concrete shrinkage, structural cracks or defects, faulty construction, faulty design, faulty materials (other than sealant), misuse of structure, settlement or accident, fire or other casualty, or physical damage.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate for disposal waste material generated by this Section.
.2 Place in appropriate on-site bins in accordance with Waste Management Plan.
.3 A clean worksite is mandatory at all times. Failure to maintain the site in a clean, safe condition shall result in the Departmental Representative initiating a clean-up and related costs being deducted from progress claims.
.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Provincial and Municipal regulations.

2 Products

2.1 MATERIALS

.1 Single component neutral cure silicone sealant for non-structural glazing applications with plus / minus 50 percent joint movement capability; ASTM C 920, Type S, Grade NS, Class 50, Use NT, M, G and A.

.1 Substrates: concrete, masonry, aluminum, glass & plastics.
Expected service life: 20 years +.
Possible uses: conventional glazing, window & door frames, window perimeters, curtain walls, expansion & control joints etc.

.2 Single component mildew resistant silicone sealant plus/minus 25% movement capability; ASTM C 920, Type S, Grade NS, Class 25, Use NT, G and A.

.1 Substrates: glass, aluminum, tile and fiberglass.
Possible uses: countertops, kitchen & bath areas, non-structural glazing, etc.

2.2 ACCESSORIES

.1 Primer: Type recommended by the sealant manufacturer and compatible with joint forming materials.

.2 Joint Cleaner: Non-corrosive and non-staining type recommended by sealant manufacturer and compatible with joint forming materials.

.3 Soft Backer Rod: non-gassing, reticulated closed-cell polyethylene rod designed for use with cold-applied joint sealants.

.1 Comply with ASTM C 1330.

.2 Size required for joint design.

.4 Closed-Cell Backer Rod: closed-cell polyethylene rod designed for use with cold-applied joint sealants for on-grade or below-grade applications.

.1 Comply with ASTM C 1330.

.2 Size required for joint design.

.5 Joint Filler: closed-cell polyethylene joint filler, designed for use in cold joints, construction joints or isolation joints wider than 1/4 inch (6mm).

.1 Size required for joint design.

.6 Bond Breaker: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

2.3 COLOR

.1 Sealant Colors: Selected by Departmental Representative.

.1 Custom color matching submittal of job site substrate samples.

3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 EXAMINATION

.1 Inspect all areas involved in work to establish extent of work, access and need for protection of surrounding construction.

.2 Conduct pre-application inspection of site verification with an authorized manufacturer's representative.

.3 Occupied areas: where high VOC materials are utilized, investigate occupants to determine the measures to be taken to accommodate them.

3.3 PREPARATION

.1 Remove loose materials and foreign matter which could impair adhesion of the sealant.

.2 Clean joint and saw cuts by grinding, sandblasting or wire brushing to expose a sound surface free of contamination and laitance.

.3 Ensure structurally sound surfaces are dry, clean, free of dirt, moisture, loose particles, oil, grease, asphalt, tar, paint, wax, rust, waterproofing, curing and parting compounds, membrane materials and other foreign matter.

.4 Where the possibility of sealants staining adjacent areas or materials exist, mask joints prior to application.

.1 Do not remove masking tape before joints have been tooled and initial cure of joint filler has taken place.

.2 Work stained due to failure of proper masking precautions will not be accepted.

3.4 INSTALLATION:

.1 Priming:

.1 Prime all surfaces to receive sealant with recommended primer unless the mockup proves otherwise.

.2 Back-Up Material:

.1 Install appropriate size backer rod, larger than joint where necessary according to manufacturer's recommendations.

.2 Install polyethylene joint filler in joints wider than 1/4 inch (6mm) to back-up material per manufacturer's recommendations.

.3 Bond Breaker:

.1 Install bond-breaker strip in joint to be sealed on top of back-up material to prevent adhesion of sealant to back-up material; install per manufacturer's recommendations.

.4 Sealant:

.1 Prepare sealants that require mixing; follow manufacturer's recommended procedures, mixing thoroughly.

.2 Mix only as much material as can be applied within manufacturer's recommended procedures, mixing thoroughly.

.3 Apply materials in accordance with manufacturer's recommendations; take care to produce beads of proper width and depth, tool as recommended by manufacturer and immediately remove surplus sealant.

.4 Apply materials only within manufacturer's specified application life period. Discard sealant after application life is expired or if prescribed application period has elapsed.

3.5 CLEANING

.1 Remove uncured sealant with xylene or toluene. Remove cured sealant by razor, scraping or mechanically.

.2 Remove all debris related to application of sealants from job site in accordance with all applicable regulations for hazardous waste disposal.

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