DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

Document Identification		**DR**

VOLUME 1 SPECIFICATIONS

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 – GENERAL REQUIREMENTS

** Issued by Addendum 1*

DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

** Issued by Addendum 1*

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DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

Document Identification		**DR**

VOLUME 2 SPECIFICATIONS

DIVISION 20 – GENERAL REQUIREMENTS

DIVISION 21 – FIRE SUPPRESSION

DIVISION 22 – PLUMBING

DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING

** Issued by Addendum 1*

DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

** Issued by Addendum 1*

PART 1 – GENERAL

1.1 GENERAL INSTRUCTIONS

.1 Read and be governed by conditions of the *Contract Documents,* including Sections of Division 01.

1.2 SECTION INCLUDES

.1 1.1 General Instructions
.2 1.2 Section Includes
.3 1.3 Summary
.4 1.4 Submittals
.5 1.5 Quality Assurance
.6 1.6 Field Conditions
.7 1.7 Extended Warranty
.8 2.1 Sealants
.9 2.2 Accessories
.10 3.1 Manufacturer's Recommendations
.11 3.2 Preparation
.12 3.3 Masking
.13 3.4 Installation
.14 3.5 Adjusting and Cleaning

1.3 SUMMARY

.1 Section includes:

.1 Exterior building sealants.

.1 Exterior joint sealant is required at, but not limited to, the following locations::

.1 Around all exterior openings.

.2 Under and around all thresholds.

.3 At all joints between door and window frames and masonry.

.4 Around perimeter of all metal grilles and louvres.

.5 At control joints and expansion joints in unit masonry assemblies.

.2 Interior building sealants.

.1 Interior joint sealant is required at, but not limited to, the following locations:

.1 Around all door frames.

.2 In control joints in gypsum board walls and partitions.

.3 At junction of gypsum board ceilings and unit masonry assemblies.

.4 In control joints and expansion joints in unit masonry assemblies.

.5 Between different materials abutting in the joint.

.6 Around windows.

.7 At the top of tiled bases and walls.

.8 At floor-wall joints and where indicated in the drawings.

.3 The installations listed in this section shall not be considered to represent a complete list of all situations where joint sealers will be required for the *Work*. Thorough scrutiny of the complete *Contract Documents* shall be done in order to obtain a complete list of all situations where joint sealers are or may be required for the *Work*.

1.4 SUBMITTALS

.1 Submit required submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit the manufacturer's and *Product* name for each sealant which will be used in the *Work* prior to commencing the *Work*.

.3 *Product* data sheets:

.1 Submit the manufacturer’s *Product* data sheets for *Products* proposed for use in the work of this Section.

.4 Test sealant in contact with samples of materials to be sealed to verify adhesion will be achieved and no staining of the material will result. Prepare sample joints at the *Place of the Work* of each type of sealant for each joint condition.

.1 Submit test results to the *Consultant* prior to application of sealants.

.5 Test sealant in contact with samples of porous materials to be sealed to ensure that no staining of the material will result in accordance with ASTM C1248-08 (2012).

.1 Submit test results to the *Consultant* prior to application of sealants.

.6 Submit 2440 mm (96") long sealant joint mock-up.

.7 Submit "wet sample" sealant colour samples for each sealant *Product* and colour.

1.5 QUALITY ASSURANCE

.1 Qualifications: *Provide* work of this Section, executed by competent installers with minimum five years’ experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers. The *Contractor* shall ensure that the installer *Subcontractor* complies with quality assurance articles referenced in ASTM C1193-13 for installation of joint sealants.

.2 Conduct quality control in accordance with Section 01 45 00 – Quality Control.

1.6 FIELD CONDITIONS

.1 Verify substrates and ambient air temperature at the *Place of the Work* before, during and after application to ensure compliance with the manufacturer’s recommendations. Surfaces shall be frost-free, dust-free, clean and completely dry at time of installation.

.2 Weather Conditions: In accordance with the manufacturer’s instructions, do not apply silicone joint sealants in snow, rain, fog or mist, or when such conditions are expected. Allow joint surfaces to attain dry conditions as recommended by the manufacturer before sealant application.

.3 Sealant and substrate materials: Conform to the sealant manufacturer's specifications and recommendations. Keep organic sealant materials heated to at least 16°C when working at temperatures below 10°C.

1.7 EXTENDED WARRANTY

.1 Warranty work of this Section for a period of two years from the date of Substantial performance, in accordance with Section 01 78 36 - Warranties.

.2 Repair or replace joint sealants which fail to perform as air tight and water-tight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, or general durability; or appear to deteriorate or become unserviceable or causing an objectionable appearance resulting from either defective or non-conforming materials and workmanship or in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.

.3 Defects shall include, but are not limited to:

.1 Staining from abutting materials or filler.

.2 Migrating, bleeding into, or staining abutting materials.

.3 Unsightly surface deformation by causes other than movement.

.4 Excessive colour change, chalking, or dust pick-up.

.5 Failing adhesively or cohesively where maximum elongation is less than 25% of designed width of exposed joints.

.6 Hardening to more than 25% over specified hardness.

PART 2 - PRODUCTS

2.1 SEALANTS

.1 General:

.1 Colours: Sealant colours shall match colours of adjacent materials, as selected and approved by the *Consultant*:

.1 Colours shall be selected from the manufacture’s full range of colours, generally to match adjacent finished colours

.2 Comply with ASTM C920-11 and other requirements indicated for each liquid- applied chemically curing sealant, including those referencing ASTM C920-11 classifications for type, grade, class, and uses.

.3 *Provide* joint sealants, primer(s) and backings that are compatible with one another and with joint substrates under conditions of service and application as demonstrated by joint sealant manufacturer based on proven test results and field experience.

.4 For sealants to be applied to porous substrates: *Provide Products* that have undergone testing according to ASTM D1248-12 and have not stained porous joint substrates indicated for *Work*.

.5 Sealant supplied shall not exude any material(s) which travels into adjacent materials, or travels onto surfaces of adjacent materials; causing damage, or attracting soiling, which becomes apparent during the service life of the building.

.2 Interior sealants shall have Volatile Organic Compound (VOC) limit of less than 250 g/L.

.3 Sealant designations:

.1 Type 1 – Urethanes Two Part.

.1 Non-sag, multi-component, epoxidized polyurethane sealant in accordance with CAN/CGSB 19.24-M90, Type 2, Class B.

.2 Location: use at all locations except where noted otherwise.

.3 Acceptable *Product*: Dymeric, as manufactured by Tremco Ltd. or *Equivalent*.

.2 Type 2 – Silicones One Part.

.1 One-part, acetoxy silicone sealant, mildew resistant, in accordance with CAN/CGSB 19.22- M89.

.2 Location: for washroom fixtures and vanity tops.

.3 Acceptable *Product*: Tremsil 200, as manufactured by Tremco Ltd. or *Equivalent*.

.3 Type 3 – Acrylics One Part.

.1 Acrylic terpolymer sealant, solvent release, in accordance with CGSB 19-GP-5M-1984.

.2 Location: at interior joints between windows, door frames, and screen frames.

.3 Acceptable *Product*: Mono 555, as manufactured by Tremco Ltd. or *Equivalent*.

.4 Type 4 – Acoustical Sealant.

.1 Siliconized acrylic latex sealant, in accordance with CGSB 19.21-M87.

.2 Location: at all perimeter joints and openings in gypsum board systems.

.3 Acceptable *Product*: Tremflex 834, as manufactured by Tremco Ltd. or *Equivalent*.

.5 Type 5 – Urethanes Two Part.

.1 Non-sag, multi-component, chemically cured, polyurethane sealant in accordance with CAN/CGSB 19.24-M90, Type 2, Class B.

.2 Location: at control joints in masonry assemblies.

.3 Acceptable *Product*: Dymeric511, as manufactured by Tremco Ltd. or *Equivalent*.

.6 Type 6 – Urethanes Two Part.

.1 Non-sag, multi-component, chemically cured, polyurethane sealant in accordance with CAN/CGSB 19.24.

.2 Location: at all locations calling for Ethylene Propylene Diene Terpolymer (EPDM) membrane.

.3 Acceptable *Product*: Lexcan pourable sealer or *Equivalent*.

.7 Type 7 – Urethanes One Part.

.1 Non-sag, single component, polyurethane sealant in accordance with CAN/CGSB 19.13-M87.

.2 Location: at metal flashing and trim.

.3 Acceptable *Product*: RC-1 Sealant as manufactured by Lexsuco or *Equivalent*.

.8 Type 8 – Polyurethane One Part

.1 Non-sag, single component, moisture curing, modified polyurethane sealant in accordance with CGSB 19.12, class MC-2-25-B-N.

.2 Location: as toe bead filling void beneath glazing strip in Window Wall in accordance with Section 08 41 00 - Aluminum Framed Glazing Systems.

.3 Acceptable *Product*: DyMonic, as manufactured by Tremco Ltd. or *Equivalent*.

.9 Type 9 – Structural Silicone.

.1 Non-sag, single component, elastomeric, chemical curing, neutral core, medium modulus silicone sealant in accordance with CAN/CGSB 19.13-M87, MCG-2-25-A-L.

.2 Location: as structural silicone sealant in window wall in accordance with Section 08 41 00 - Aluminum Framed Glazing Systems.

.3 Acceptable *Product*: Spectrum 2, as manufactured by Tremco Ltd. or *Equivalent*.

.10 Type 10 – Acrylics One Part.

.1 Single component, elastomeric, water based, acrylic firestop sealant in accordance with CAN/ULC-S115-11.

.2 Location: fire rated joints and penetrations in fire rated systems.

.3 Acceptable *Product*: TREMstop Acrylic, as manufactured by Tremco Ltd. or *Equivalent*.

.11 Interior sealant, mildew resistant one part silicone sealant in accordance with the following:

.1 Comply with:

.1 ASTM C920-11, Type S, Grade NT, Class 25

.2 CAN/CGSB 19.22-M89.

.2 Acceptable *Products*:

.1 GE Silicones "Sanitary SCS1700 Sealant";

.2 BASF Building Systems "OmniPlus";

.3 Dow Corning "786";

.4 Tremco, Inc. "Tremsil 200";

.5 Or *Equivalent*.

2.2 ACCESSORIES

.1 General: *Provide* component joint sealant primers, backings and fillers that are compatible with joint substrates and other sealants or joint fillers specified and approved for applications indicated under joint sealant schedule.

.2 Cylindrical sealant backings: *Provide* joint backings that meet ASTM C1330-02, Type O (open-cell polyurethane), or Type B (non-absorbent bi-cellular backing materials with surface skin), sized 25 percent or greater than joint opening with proper density to control sealant depth and profile. Follow joint sealant manufacturer's recommendations with backing selections for optimum joint sealant performance, in accordance with the following schedule:

.1 Use open cell foam with non-absorbing closed cell skin for vertical joints; round shape for open joints and triangular shape for angular joints.

.2 Use closed cell foam for horizontal joints.

.3 Expansion Joint Cap: *Provide* premanufactured expansion joint cap Snap-Cap as manufactured by W.R.Meadows (or equivalent).

.4 Bond-breaker tape: Polyethylene tape or other approved plastic tape as recommended by joint sealant manufacturer to prevent 3-sided joint adhesion to rigid, inflexible joint fillers or joint surfaces at back of joint where such adhesion would restrict proper sealant movement or result in sealant failure.

.5 Masking Tape: Non-staining, non-absorbent and compatible with joint sealants and adjacent surfaces.

.6 Sealant primers: Use primers only as recommended by sealant manufacturer where required to enhance adhesion of sealant to specific joint substrates indicated and as determined for use from pre-construction mock-up testing. Select primers in consultation with sealant manufacturer and manufacturer of substrate material which do not have a detrimental effect on sealant adhesion or in-service performance.

.7 Cleaners for nonporous surfaces: *Provide* non-staining, chemical cleaners of type which are acceptable to manufacturer of sealant and sealant backing material, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

.1 *Provide* cleaner conditioner required for glass and glazed surfaces as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S RECOMMENDATIONS

.1 Unless specified otherwise herein, comply with the recommendations and directions of the manufacturer whose materials are being used in the work of this Section.

3.2 PREPARATION

.1 Prior to installation, clean substrates of substances that could impair the bond of joint sealants. Clean and prepare joint surfaces immediately before installing joint sealants. Protect adjacent work areas and finished surfaces from damage during joint sealant installation.

.2 Clean porous joint surfaces by using heavy-duty brushing, light abrasive, mechanical abrading or combination of these methods to produce a clean, sound surface for optimum bond with joint

sealants per manufacturer's recommendations. *Provide* a dry, dust-free and cleaned substrate for optimum results.

.3 Non-porous surfaces should be cleaned using the two-cloth solvent wipe method as referenced in ASTM C1193-13 and outlined by joint sealant manufacturer's instruction. IPA (isopropyl alcohol) is not a degreasing solvent yet may be used in new construction for non-porous joint cleaning and preparation. Use xylene, toluene or Methyl Ethyl Ketone (MEK) for degreasing solvent and general cleaning of non-porous surfaces.

.4 Rusting or scaling surfaces must be prepared using abrasive cleaning methods as recommended by joint sealant manufacturer prior to joint sealant installation. Efflorescence, mould, mildew and algae must be removed and neutralized prior to joint sealant installation.

.5 Coordinate cleaning, priming and installation to avoid contamination of wet, freshly coated or adjacent finished surfaces. Prepare finish-coated surfaces per joint sealant manufacturer's specific recommendations.

.6 Test materials for indications of staining or poor adhesion before any sealing is commenced. Submit results reports in writing to the *Consultant*.

3.3 MASKING

.1 Where necessary to prevent contamination or marring surfaces of adjacent materials, mask areas adjacent to joints with masking tape prior to priming or sealing application. Remove tape immediately after joint has been completed and an initial set achieved.

3.4 INSTALLATION

.1 Review the complete *Contract Documents* for extent of sealant work required.

.2 Comply with joint sealant manufacturer's installation instructions for *Products*, primers and applications indicated unless more stringent *Project*-specific instructions or requirements apply.

.3 Apply joint sealants for continuous waterproof sealant joint protection. Vertical joints should be lapped over horizontal joints as recommended by the sealant manufacturer. Comply with installation recommendations in ASTM C1193-13 for use of joint sealants as applicable to each specific sealant installation.

.4 *Install* sealant primers only when recommended by the sealant manufacturer and demonstrated at pre-construction tests after joint surface preparation has been completed and when surfaces are verified as clean and dry. Allow any primer installation to completely dry or cure prior to installation of backing or joint sealants.

.5 *Install* joint sealants in accordance with the joint sealant manufacturer's instructions using proven techniques that comply with the following and in proper sequence with installation of primers and backings.

.1 Using proper joint sealant dispensing equipment, place sealants by pushing sealant beads into opening to fully wet-out joint sealant substrates. Fill sealant joint opening to full and proper configuration.

.2 *Install*, providing uniform cross-sectional shapes and depths in relation to joint width for optimum sealant movement capability per joint sealant manufacturer's instructions.

.6 Joint sealant tooling is required for non-sag joint sealant installations. Immediately after placing fresh sealants and before skinning or curing begins, tool sealants using metal spatulas designed for this purpose in accordance with the manufacturer's recommendations. *Provide* a smooth,

uniform sealant finish, eliminating air pockets and ensuring good contact for optimum sealant adhesion within each side of the joint opening.

.1 *Provide* concave joint configuration as indicated per figure 5-A in ASTM C1193- 13 unless otherwise indicated in the Contract Documents. Dry tooling is required for joint sealants, and wet tooling agents are not allowed.

.2 Remove excess sealant from surfaces adjacent to joint openings using metal spatula, promptly cleaning any sealant residue from adjacent finished surfaces. Remove masking after joint sealant is installed.

.7 Allow single-component sealants to fully cure before adhesion testing is performed as recommended by the joint sealant manufacturer.

.8 Match approved sealant mock-up for colour, finish and overall aesthetics. Remove, refinish or re-install, at the *Contractor*'s expense, work not in compliance with the *Contract Documents*.

.9 When surfaces of adjacent materials are to be painted, perform sealant work before these surfaces are painted.

.10 Check to make sure shop paint is compatible with primer and sealant. When incompatible, inform the *Consultant* and change primer and sealant to compatible type acceptable to the *Consultant*.

.11 Check form release agent used on concrete for compatibility with primer and sealant. If they are incompatible, inform the *Consultant* and change primer and sealant to compatible type, or clean concrete to sealant manufacturer's acceptance.

.12 *Install* joint backing material, filler strips, gaskets, bond breakers and similar type material of comparable performance characteristics. Install bond breaker tape or packing over asphalt impregnated fibre board as recommended by the sealant manufacturer.

.13 Where joints are 12.7 mm (1/2") or deeper, insert backing material in continuous uniform compression with setback from finished face of adjoining materials equal to required depth of sealant (width/depth ratio) as specified in this Section.

.14 On horizontal traffic surfaces, support joint filler against vertical movement which might result from traffic loads, including foot traffic.

.15 Pack joints tightly with sealant backing set at depth specified for sealant. Fill other voids with filler.

.16 *Install* bond breaker tape in bottom of joints in lieu of sealant backing where proper depth cannot be obtained when backing is installed.

.17 Maintain correct sealant depth. Sealant depth shall be 1/2 the width of the joint, maximum depth shall be 12.7 mm (1/2"), minimum depth shall be 6 mm (1/4"). Comply with the manufacturer's written recommendations.

.18 Fillet bead sealant joints to be sized to *Provide* proper contact area with substrates, in accordance with the manufacturer's written recommendations.

.19 Apply sealants using pressure-operated guns fitted with suitable nozzles in accordance with the manufacturer's directions. Apply sealants in such manner as to ensure good adhesion to sides of joints and to completely fill voids in joints.

.20 Apply sealants so that surfaces of joints are smooth, full bead, free from ridges, wrinkles, sags, air pockets and embedded impurities. Tool sealant surfaces to produce a smooth surface.

.21 Remove droppings and excess sealant as work progresses, before material achieves initial set. Do not use soap and water in tooling.

.22 *Install* sealant materials and primers when surfaces are prepared, and ambient temperature and weather conditions are prevalent, consistent with the manufacturer's recommendations. Primer is mandatory for gun applied sealants.

.23 *Install* sealant with exterior face of sealant set back 10 mm (3/8") from face of adjacent materials at building movement joints, unless otherwise indicated.

.24 Do not apply sealants to areas where installation of paints, coatings or flooring is in progress. Apply sealants after such work is complete and fully cured.

3.5 ADJUSTING AND CLEANING

.1 Clean off excess sealant or sealant residue adjacent to sealant joint installations as the work progresses by methods approved by the joint sealant manufacturer. Do not damage adjacent surfaces with harmful removal techniques and protect finished surfaces beyond those that have been masked. Protect installed sealants during and after final curing from damage resulting during construction. Remove and replace damaged joint sealants, at the *Contractor*'s expense.

.2 Remove temporary coverings and masking protection from adjacent work areas upon completion. Remove construction debris from the *Site* on a planned and regular basis.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL INSTRUCTIONS

1. Read and be governed by conditions of the *Contract Documents,* including sections of Division 1.

1.2 SECTION INCLUDES

1.3 SUMMARY

1. Section includes:

.1 Aluminum entrances.

.2 Aluminum windows.

1.4 SUBMITTALS

1. Submit required submittals in accordance with Section 01 33 00.

2. *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for Products proposed for use in the work of this section.

3. Shop drawings:

.1 Further to requirements of Section 01 33 00, indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anticipated deflection under load, affected related work, weep drainage network, expansion and contraction joint location and details, field welding, coordination with hardware and electrical requirements.

.2 Identify and describe material types being supplied, wall thicknesses of extrusions, and shapes including connections and grades, dimensions and tolerances (minimum and maximum), attachments, reinforcing, anchorage and locations of fastenings, and provisions for thermal and structural movement between components of this section and adjacent materials.

.3 Include description of materials, metal finishing specifications, and other pertinent information.

.4 Design loads, typical reactions and support movement allowances, both vertical and horizontal, shall be placed on the shop drawings.

.5 Shop drawings shall clearly indicate the specification of materials and, where applicable, indicate installation methods and coordination with other sections.

.6 Submit framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

4. Samples:

.1 Submit samples of frame, sill and mullion sections, sill flashing and accessories, fasteners for connection of frame to opening, glazing tape, glass retainers, glazing gaskets, screening and frame, spandrel panels and each finish material and any other material, as requested.

.2 Samples of colour and finish prepared as specified on respective metal components for both extrusion and sheet.

.3 Identify samples as to treatment, thickness, alloy, framing composition, colour, manufacture, performance standard and portion of the work to which they apply.

.4 Fabrication shall not proceed without written acceptance of samples from the *Consultant*.

5. Test reports:

.1 Submit valid laboratory test reports, prepared by an independent laboratory, verifying that proposed system has been tested by an independent laboratory and achieved performance values that meet the specified performance criteria.

1.5 CLOSEOUT SUBMITTALS

1. Operation and maintenance data:

.1 Submit manufacturer's operation and maintenance instructions for incorporation into the operation and maintenance manuals in accordance with Section 01 77 00.

1.6 QUALITY ASSURANCE

1. Qualifications:

.1 Installers / applicators / erectors:

.1 Execute work of this section only by company who has adequate plant, equipment, and skilled workers to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.2 *Provide* at least one trade specialist who shall be thoroughly trained and experienced in skills required, be completely familiar with referenced standards and requirements of this work, and personally direct installation performed under this section.

.1 Foreperson experience: Minimum 10 years' experience as glazing mechanic.

.2 Typical glazing mechanic experience: Minimum 3 years' experience as glazers.

.3 Welding: Perform welding of structural components only by fabricators certified by Canadian Welding Bureau to CSA Welding qualification codes; CSA W47.1-09(2014) for welding of steel, and CSA W47.2-12 for welding of aluminum.

1.7 DELIVERY, STORAGE, AND HANDLING

1. Store parts in a dry place and permit natural ventilation over their finished surfaces.
2. Store materials in locations protected from damage of other trades.
3. Under conditions of high humidity or cold temperatures, supply heating or forced air ventilation to prevent accumulation of surface moisture.
4. Mark components to show location on building and on the Drawings.
5. Protect finishes with strippable coating that will not mar, nor deface finish on removal, or a similar method designed to afford an equivalent amount of protection. Leave protected coating intact until damage risk is past or immediately prior to final cleaning.
6. Stacking should be done to prevent bending pressure or abrasion of finished surfaces.
7. Brace and protect frame units to prevent distortion and damage in shipment and handling.
8. *Provide* methods for lifting or hoisting units into place without causing damage.

1.8 FIELD CONDITIONS

1. Comply with requirements of *Product* manufacturers.

1.9 WARRANTY

1. This section shall assume responsibility for warranties of glass and glazing included in the work of this section, in accordance with Section 08 80 00.

PART 2 - PRODUCTS

2.1 MANUFACTURER

1. *Work* of this section shall be provided by one of the following:

.1 Alumicor Limited.

.2 Kawneer Company Ltd.

.3 Or equivalent (substitutions in accordance with Section 01 25 00).

2.2 PERFORMANCE/DESIGN REQUIREMENTS

1. Air Leakage; except entrance doors: Air leakage through the work shall not exceed 0.3 L/s/m2 (0.06 cfm/ft2) of glazing area when tested in accordance with ASTM E283- 04(2012) at test pressure of 300 Pa (6.24 psf).

2. Water Penetration (other than entrance doors): No water penetration shall occur when the work is tested in accordance with ASTM E331-00(2009), amended to prohibit water from passing through interior glazing seals or frame joints, at a test pressure of 300 Pa (6.24 psf).

3. Fabricate mullions to ensure under specified loads a maximum deflection of 1/175 of mullion span or 19 mm (3/4"), whichever is less.

4. Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with code.

5. Design and size components to withstand seismic loads and sway displacement as calculated in accordance with code.

6. *Provide* system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system,

.2 Movement between system and perimeter framing components,

.3 Dynamic loading and release of loads,

.4 Deflection of structural support framing,

7. Maintain continuous air barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound, in accordance with the *Contract Documents*.

8. Position thermal insulation to exterior of air barrier, in accordance with the *Contract Documents*. .

9. Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

10. *Provide* anchors sufficiently rigid to resist wind and snow loads caused by aluminum shades and brackets, without damage to wall system.

2.3 MATERIALS

1. Aluminum extrusions: Aluminum Association alloy AA6063-T5 or T6 temper for framing.

2. Sheet aluminum: aluminum sheet, 0.92 mm (0.04") minimum thickness.

.1 Aluminum alloy:

.1 AA3003-H14 Painting Quality.

.2 AA5005H14 Anodizing Quality.

3. Concealed sheet metal air barriers: 1 mm (0.04") (22 gauge) Z275 galvanized steel sheet.

4. Fasteners: aluminum or Type 304 stainless steel, finished to match adjacent material.

5. Isolation coating: alkali resistant bituminous paint or epoxy solution.

6. Glazing gaskets: fully resilient, shim type butyl glazing tape or EPDM glazing gasket.

7. Glass and other glazing materials: Refer to Section 08 80 00.

8. Silicone Sealant: One component, chemical curing; capable of water immersion without loss of properties: cured Shore A Durometer hardness of 15 to 25 to ASTM D2240- 05 (2010), colour as selected by the *Consultant*, where exposed, to ASTM C920-11.

9. Sheet metal work air barrier sealant: One component elastomeric chemical curing, to ASTM C920-11.

10. Air barrier membrane:

.1 Self-Adhesive membrane: Composite preformed modified membrane system consisting of SBS modified asphalt for low temperature flexibility and polyethylene scrim reinforcing. Acceptable Products:

.1 Bakor 'Blueskin SA' Self-Adhesive Grade Air Barrier Membrane.

.2 Soprema 'Sopraseal Stick 1100'.

.3 W.R. Meadows 'Air Shield'.

.4 .4 Or equivalent.

.2 Primer: as recommended by manufacturer.

.3 Membrane Properties:

.1 Thickness: 1.0 mm (40 mils).

.2 Application temperature: minimum +5°C.

.3 Service temperature: -40°C to +70°C.

.4 Elongation: 200% minimum in accordance with ASTM D412-06a (2013)- modified.

.5 Low temperature flexibility: to -30°C to CGSB 37-GP-56M-1985.

.6 Air leakage: 0.005 L/m2.s under a pressure differential of 75 Pa (0.01 PSI) in accordance with ASTM E283-04(2012).

2.4 ENTRANCE FRAMING

1. Exterior aluminum framing: 50.8 mm x 152.4 mm (2" x 6") frames and 152.4 mm x 152.4 mm (6" x 6") jambs, thermally broken extruded aluminum assembly with flush sight lines.

.1 Acceptable *Product*: Kawneer Tri Fab 601UT or equivalent.

2. Interior aluminum framing: 45 mm x 114 mm (1-3/4" x 4-1/2") frames and 114 mm x 114 mm (4-1/2" x 4-1/2") jambs, non-thermally broken extruded aluminum assembly with flush sight lines.

.1 Acceptable *Product*: Kawneer Tri Fab 450 or equivalent.

3. All section shall be designed for shear block joinery.

2.5 ALUMINUM ENTRANCE DOORS - EXTERIOR

1. Entrance glazing system shall be designed according to Section 08 41 00 requirements and the following:

.1 Doors:

.1 Acceptable *Product*: Kawneer '350 Medium Stile' or equivalent.

.2 Fasteners connecting and fixing the frame members shall be concealed.

.3 Reinforce mechanically-joined corners of doors by welding, spigotting, welding and spigotting or by one piece cast aluminum angle to produce sturdy door unit.

.4 Door stiles shall be weathered with metal backed polypropylene pile weather- stripping. *Provide* weather-stripping sweeps at door bottoms.

.5 Door hardware: Norton 1605 closer, 1 MS lock and 2 thumb latches (locations ass scheduled or indicated), exterior threshold 115 mm (4.5"), 1 pair butt hinges, weather stripping and Classic Hardware CO-9 with stainless steel US32 polished finish, flash cap across the top of door.

.1 *Provide* Unican locks where indicated or scheduled in the *Contract Documents*.

.2 Barrier free door operators: in accordance with Section 08 71 13.

.6 Weathering on offset pivot or butt hung doors (single or pairs) shall be Kawneer SEALAIR elastomeric weathering of tubular shape, with a semi-rigid polymeric backing, or equivalent.

.7 Door bottom rail weathering (where required) shall be an extruded elastomeric blade sweep strip applied with concealed fasteners.

.8 Glass: Refer to Section 08 80 00.

2.6 ALUMINUM ENTRANCE DOORS - INTERIOR

1. Interior entrance and interior glazing system shall be designed according to Section 08 41 00 requirements and the following:

.1 Doors:

.1 Acceptable *Product*: Kawneer '350 Medium Stile' or equivalent.

.2 Fasteners connecting and fixing the frame members shall be concealed.

.3 Reinforce mechanically-joined corners of doors by welding, spigotting, welding and spigotting or by one piece cast aluminum angle to produce sturdy door unit.

.4 Door stiles shall be weathered with metal backed polypropylene pile weather- stripping. *Provide* weather-stripping sweeps at door bottoms.

.5 Door hardware: Norton 1605 closer, 1 MS lock and 1 thumb latch (locations as scheduled or indicated), 1 pair butt hinges, and Classic Hardware CO-9 with stainless steel US32 polished finish, flash cap across the top of door.

.1 Barrier free door operators: in accordance with Section 08 71 13.

.6 Weathering on offset pivot or butt hung doors (single or pairs) shall be Kawneer SEALAIR elastomeric weathering of tubular shape, with a semi-rigid polymeric backing, or equivalent.

.7 Door bottom rail weathering (where required) shall be an extruded elastomeric blade sweep strip applied with concealed fasteners.

.8 Glass: Refer to Section 08 80 00.

2.7 ALUMINUM CURTAIN WALL

1. Glass Design:

.1 Glass shall be designed according to CAN/CGSB 12.20-M89 and Section 08 80 00.

.2 Glass subjected to guard loads shall be designed with an alternative resistance path in the event of failure of one lite or ply of glass.

.3 Insulating glass units in accordance with Section 08 80 00.

2. Curtain wall shall be designed according to Section 08 41 00 requirements and the following:

.1 Acceptable Products:

.1 Alumicor ‘VersaWall 2200 Series’.

.2 Kawneer ‘1620’, with vertical SSG (50.8mm x 152.4mm)

.3 Or equivalent.

.2 Thermally broken sections.

.3 Mechanically fasten horizontal and vertical edges of infill materials and glass units with mechanically fastened continuous pressure plates complete with caps.

.4 Glazing cavity shall be compartmentalized at every floor level and every 6000 mm horizontally to prevent the movement of air in accordance with standard rain screen design.

.5 Fasteners: concealed.

.6 Cap extensions shall be extruded to profiles indicated and scheduled. Break- formed cap extensions will not be accepted.

2.8 FINISHES

1. Exposed aluminum surfaces; anodized to AAMA 611-98:

.1 Clear anodized to AA Designation AA-M12C22A41 at exterior, AA-M12C22A31 at interior.

2.9 FABRICATION

1. Sills: extruded aluminum, finished to match window frames, 15 mm (5/8") minimum projection beyond wall surface. *Provide* preformed end caps wherever sill terminates. Butt joint sill and *Provide* preformed splice connector and sealant to prevent water penetration. Locate splice

connectors (joint covers) at center line of mullions when required. Trim and detail corners neatly.

2. Make allowances for deflection of structure. Ensure that structural loads are not transmitted to aluminum work.
3. *Provide* structural steel reinforcement for strength, stiffness and connections.
4. Fit intersecting members to flush hairline weathertight joints and mechanically fasten together, except where indicated otherwise.
5. Conceal fastenings from view. Exposed fastenings where indicated.
6. Form cut-outs, recesses, mortising or milling for finishing hardware to templates supplied. Reinforce with aluminum or galvanized steel plates.
7. Field apply isolation coating to aluminum in contact with dissimilar metals and/or cementitious materials.
8. Fabricated assemblies shall make required clearances other assemblies and for deflection of structure.

PART 3 - EXECUTION

3.1 INSTALLATION

1. Install work of this section plumb, square, level, free from warp, twist and superimposed loads.
2. Secure work in required position. Do not restrict thermal movement.
3. Install hardware in accordance with templates.
4. Adjust operable parts for correct function.
5. Isolate from cementitious materials.

3.2 AIR VAPOUR BARRIER CLOSURES

1. It is the responsibility of this section to give complete cooperation in providing and maintaining the continuity of air/vapour seal to adjacent materials to which the windows and frames abut. Fit flexible seals, tapes, sealants and gaskets at locations required to achieve air/vapour/water resistant and weathertight junctions. Ensure continuity of seal at end joints between lengths of material by overlapping and cementing. Caulk junctions of system components to themselves and other work with sealant to maintain effective vapour, air and water barrier and fix in place with an aluminum flat to the air/vapour seal line at the adjacent material and to the glazing rebate.
2. Where deflection of structure will cause dynamic joint movement between aluminum work and dissimilar materials, install flexible seals of sufficient width to allow formation of bellows to take up any torsional and shear stresses.

3.3 GLAZING

1. Glaze aluminum framed windows and doors at exterior using insulating glazing units in accordance with Section 08 80 00.
2. Glaze interior windows and doors in accordance using glass types given in the glazing schedule and in accordance with section 08 80 00.

3.4 SEALANTS

1. Seal between frame members, sills and adjacent construction as a part of the work of this section and in accordance with Section 07 92 00.

3.5 HARDWARE

1. Install in accordance with manufacturer's installation instructions.
2. Accurately locate and adjust hardware to meet manufacturer's instructions. Use special tools and jigs as recommended.
3. Set, fit and adjust hardware according to manufacturer's directions, at heights as confirmed by the *Consultant*. Hardware shall operate freely. Protect installed hardware from damage and paint spotting.
4. At operable windows, provide hook bolt locking mechanisms (2 per window) and crank mechanism complete with T-Crank window handle (as manufactured by CR Laurence) H38xx (last two digits dependant on colour selection). Handle must not project beyond interior face of window framing so that window shades can be adjusted without interference of handle. Finish of locking and crank mechanisms shall match finish of framing.
5. Powered hardware:

.1 Power wiring will be supplied and installed by electrical work installer including conduit, boxes and other electrical appurtenances, including connections and terminations. Be responsible for ensuring that all wiring work is done in accordance with the Suppliers wiring diagrams and directions.

.2 Arrange for testing and commissioning of system by the distributor of the system. Submit a copy of reports to the *Consultant*.

3.6 ADJUSTING AND CLEANING

1. Cleaning on completion of installation:

.1 Remove deposits which affect appearance or operation of units.

.2 Remove protective materials.

.3 Clean interior and exterior surfaces by washing with clear water; or with water, and soap or detergent; followed by a clear water rinse.

.4 Clean and restore stained metal surfaces in accordance with manufacturer's recommendations. Replace if cleaning is impossible.

.5 Final cleaning is specified in Section 01 77 00.

END OF SECTION