

1 GENERAL

1.1. GENERAL INSTRUCTIONS

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

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. Closeout Submittals
6. 1.6. Quality Assurance
7. 1.7. Delivery, Storage, And Handling
8. 1.8. Field Conditions
9. 1.9. Warranty
10. 2.1. Manufacturer
11. 2.2. Performance/Design Requirements
12. 2.3. Materials
13. 2.4. Aluminum Framed Glazing System
14. 2.5. Interior Framing
15. 2.6. Aluminum Entrance Doors - Exterior
16. 2.7. Aluminum Entrance Doors - Interior
17. 2.8. Finishes
18. 2.9. Fabrication
19. 3.1. Installation
20. 3.2. Window Wall System Installation:
21. 3.3. Installation Interior Architectural Wall Systems
22. 3.4. Air Vapour Barrier Closures
23. 3.5. Glazing
24. 3.6. Sealants
25. 3.7. Hardware
26. 3.8. Field Quality Control
27. 3.9. Adjusting And Cleaning

1.3. SUMMARY

- 1.3.1. Section includes:
- 1.3.1.1. Aluminum entrances.
 - 1.3.1.2. Aluminum windows.

1.4. SUBMITTALS

- 1.4.1. Submit required submittals in accordance with Section 01 33 00.
- 1.4.2. Product data sheets:
- 1.4.2.1. Submit manufacturer's *Product* data sheets for Products proposed for use in the work of this section.
- 1.4.3. Shop drawings:
- 1.4.3.1. 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.
 - 1.4.3.2. 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.
- 1.4.3.3. Include description of materials, metal finishing specifications, and other pertinent information.
 - 1.4.3.4. Design loads, typical reactions and support movement allowances, both vertical and horizontal, shall be placed on the shop drawings.
 - 1.4.3.5. Shop drawings shall clearly indicate the specification of materials and, where applicable, indicate installation methods and coordination with other sections.
 - 1.4.3.6. Submit framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.
 - 1.4.4. Samples:
 - 1.4.4.1. 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.
 - 1.4.4.2. Samples of colour and finish prepared as specified on respective metal components for both extrusion and sheet.
 - 1.4.4.3. Identify samples as to treatment, thickness, alloy, framing composition, colour, manufacture, performance standard and portion of the work to which they apply.
 - 1.4.4.4. Fabrication shall not proceed without written acceptance of samples from the *Consultant*.
 - 1.4.5. Test reports:
 - 1.4.5.1. 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

- 1.5.1. Operation and maintenance data:
 - 1.5.1.1. 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

- 1.6.1. Qualifications:
 - 1.6.1.1. 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.
 - (A) Foreperson experience: Minimum 10 years' experience as glazing mechanic.
 - (B) 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

- 1.7.1. Store parts in a dry place and permit natural ventilation over their finished surfaces.

- 1.7.2. Store materials in locations protected from damage of other trades.
- 1.7.3. Under conditions of high humidity or cold temperatures, supply heating or forced air ventilation to prevent accumulation of surface moisture.
- 1.7.4. Mark components to show location on building and on the Drawings.
- 1.7.5. 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.
- 1.7.6. Stacking should be done to prevent bending pressure or abrasion of finished surfaces.
- 1.7.7. Brace and protect frame units to prevent distortion and damage in shipment and handling.
- 1.7.8. Provide methods for lifting or hoisting units into place without causing damage.

1.8. FIELD CONDITIONS

- 1.8.1. Comply with requirements of *Product* manufacturers.

1.9. WARRANTY

- 1.9.1. 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.

2 PRODUCTS

2.1. MANUFACTURER

- 2.1.1. Work of this section shall be provided by the following:
 - 2.1.1.1. Alumicor
 - 2.1.1.2. Kawneer Company Ltd.
 - 2.1.1.3. Or equivalent (substitutions in accordance with Section 01 25 00).

2.2. PERFORMANCE/DESIGN REQUIREMENTS

- 2.2.1. 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).
- 2.2.2. 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).
- 2.2.3. Fabricate mullions to ensure under specified loads a maximum deflection of 1/175 of mullion span or 19 mm (3/4"), whichever is less.
- 2.2.4. 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.
- 2.2.5. Design and size components to withstand seismic loads and sway displacement as calculated in accordance with code.
- 2.2.6. Provide system to accommodate, without damage to components or deterioration of seals:
 - 2.2.6.1. Movement within system,
 - 2.2.6.2. Movement between system and perimeter framing components,
 - 2.2.6.3. Dynamic loading and release of loads,
 - 2.2.6.4. Deflection of structural support framing,
- 2.2.7. 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.
- 2.2.8. Position thermal insulation to exterior of air barrier, in accordance with the Contract Documents.
- 2.2.9. 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.
- 2.2.10. Provide anchors sufficiently rigid to resist wind and snow loads caused by aluminum shades and brackets, without damage to wall system.

2.3. MATERIALS

- 2.3.1. Aluminum extrusions: Aluminum Association alloy AA6063-T5 or T6 temper for framing.
- 2.3.2. Sheet aluminum: aluminum sheet, 0.92 mm (0.04") minimum thickness.
 - 2.3.2.1. Aluminum alloy:
 - (1) AA3003-H14 Painting Quality.
 - (2) AA5005H14 Anodizing Quality.
- 2.3.3. Concealed sheet metal air barriers: 1 mm (0.04") (22 gauge) Z275 galvanized steel sheet.
- 2.3.4. Fasteners: aluminum or Type 304 stainless steel, finished to match adjacent material.
- 2.3.5. Isolation coating: alkali resistant bituminous paint or epoxy solution.
- 2.3.6. Glazing gaskets: fully resilient, shim type butyl glazing tape or EPDM glazing gasket.
- 2.3.7. Glass and other glazing materials: Refer to Section 08 80 00.
- 2.3.8. 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.
- 2.3.9. Sheet metal work air barrier sealant: One component elastomeric chemical curing, to ASTM C920-11.
- 2.3.10. Air barrier membrane:
 - 2.3.10.1. 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) Or equivalent.
 - 2.3.10.2. Primer: as recommended by manufacturer.
 - 2.3.10.3. 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. ALUMINUM FRAMED GLAZING SYSTEM

- 2.4.1. Glass Design:
 - 2.4.1.1. Glass shall be designed according to CAN/CGSB 12.20-M89 and Section 08 80 00 - Glass and Glazing.
 - 2.4.1.2. 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.
 - 2.4.1.3. Insulating glass units in accordance with Section 08 80 00 - Glass and Glazing.
- 2.4.2. Curtain wall shall be designed according to Section 08 41 00 – Aluminum Framed Glazing Systems requirements and the following:
 - 2.4.2.1. Acceptable Products:
 - (1) Alumatic 'ThermaWall TW2200 Series'.
 - (2) Or Equivalent.
 - 2.4.2.2. Thermally broken sections.
 - 2.4.2.3. Mechanically fasten horizontal and vertical edges of infill materials and glass units with mechanically fastened continuous pressure plates complete with caps.
 - 2.4.2.4. 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.
 - 2.4.2.5. Fasteners: concealed.

- 2.4.2.6. Cap extensions shall be extruded to profiles indicated and scheduled. Break-formed cap extensions will not be accepted
- 2.4.2.7. Spandrel Panel shall have backpans fabricated with 22 Ga. Galvanised sheet steel, Top hat Section to integrate into Curtain wall framing. Inside face of backpan to align with inside face of adjacent mullions.

2.5. INTERIOR FRAMING

- 2.5.1. 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.
 - 2.5.1.1. Acceptable Product: Kawneer Tri Fab 451
 - 2.5.1.2. or Equivalent.
- 2.5.2. All section shall be designed for shear block joinery.

2.6. ALUMINUM ENTRANCE DOORS - EXTERIOR

- 2.6.1. Entrance glazing system shall be designed according to Section 08 41 00 requirements and the following:
 - 2.6.1.1. Doors:
 - (1) Acceptable *Product*:
 - (A) Alumicor ThermaPorte 7700
 - (B) or equivalent.
 - 2.6.1.2. Fasteners connecting and fixing the frame members shall be concealed.
 - 2.6.1.3. Reinforce mechanically-joined corners of doors by welding, spigotting, welding and spigotting or by one piece cast aluminum angle to produce sturdy door unit.
 - 2.6.1.4. Door stiles shall be weathered with metal backed polypropylene pile weather-stripping. Provide weather-stripping sweeps at door bottoms.
 - 2.6.1.5. Door hardware: Norton 1605 closer, 1 MS lock and 2 thumb latches (locations as 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) Barrier free door operators: in accordance with Section 08 71 13.
 - 2.6.1.6. 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.
 - 2.6.1.7. Door bottom rail weathering (where required) shall be an extruded elastomeric blade sweep strip applied with concealed fasteners.
 - 2.6.1.8. Glass: Refer to Section 08 80 00.

2.7. ALUMINUM ENTRANCE DOORS - INTERIOR

- 2.7.1. Interior entrance and interior glazing system shall be designed according to the requirements of this Section and the following:
 - 2.7.1.1. Doors:
 - (1) Acceptable *Product*:
 - (A) Canadiana HD
 - (B) or Equivalent.
 - 2.7.1.2. Fasteners connecting and fixing the frame members shall be concealed.
 - 2.7.1.3. Reinforce mechanically-joined corners of doors by welding, spigotting, welding and spigotting or by one piece cast aluminum angle to produce sturdy door unit.
 - 2.7.1.4. Door stiles shall be weathered with metal backed polypropylene pile weather-stripping. Provide weather-stripping sweeps at door bottoms.
 - 2.7.1.5. Door hardware: Norton 1605 closer or equivalent, 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) .1 Barrier free door operators: in accordance with Section 08 71 13 – Automatic Door Operators.

2.8. FINISHES

- 2.8.1. Exposed aluminum surfaces; anodized to AAMA 611-98:
 - 2.8.1.1. Color to AA Designation AA-M12C22A41 at exterior, AA-M12C22A31 at interior.
 - 2.8.1.2. Refer to Contract Documents for color finishes.

2.9. FABRICATION

- 2.9.1. 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.
- 2.9.2. Make allowances for deflection of structure. Ensure that structural loads are not transmitted to aluminum work.
- 2.9.3. Provide structural steel reinforcement for strength, stiffness and connections.
- 2.9.4. Fit intersecting members to flush hairline weathertight joints and mechanically fasten together, except where indicated otherwise.
- 2.9.5. Conceal fastenings from view. Exposed fastenings where indicated.
- 2.9.6. Form cut-outs, recesses, mortising or milling for finishing hardware to templates supplied. Reinforce with aluminum or galvanized steel plates.
- 2.9.7. Field apply isolation coating to aluminum in contact with dissimilar metals and/or cementitious materials.
- 2.9.8. Fabricated assemblies shall make required clearances other assemblies and for deflection of structure.

3 EXECUTION

3.1. INSTALLATION

- 3.1.1. Install work of this section plumb, square, level, free from warp, twist and superimposed loads.
- 3.1.2. Secure work in required position. Do not restrict thermal movement.
- 3.1.3. Install hardware in accordance with templates.
- 3.1.4. Adjust operable parts for correct function.
- 3.1.5. Isolate from cementitious materials.

3.2. WINDOW WALL SYSTEM INSTALLATION:

- 3.2.1. Install window wall systems plumb, level, and true to line, without warp or rack of frames, within manufacturer's prescribed tolerances, and complying with installation instructions.
- 3.2.2. Provide support and anchor in place.
- 3.2.3. Dissimilar Materials:
 - 3.2.3.1. Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
- 3.2.4. Glazing:
 - 3.2.4.1. Glass shall be inside-glazed.
 - 3.2.4.2. Glass shall be held in place with extruded aluminum glass stops.
- 3.2.5. Water Drainage
 - 3.2.5.1. Each light of glass shall be internally drained using water deflectors and sealant to divert water to the sill horizontal weep locations.
 - 3.2.5.2. Weep holes shall be located in the sill to divert water to the exterior of the building.
- 3.2.6. Related Products Installation:
 - 3.2.6.1. Sealants (Perimeter):
 - (1) Refer to Joint Treatment (Sealants) Section.
- 3.2.7. Glass:
 - 3.2.7.1. Refer to Glass and Glazing Section.
 - 3.2.7.2. Reference: ANSI Z97.1, CPSC 16 CFR 1201, and GANA Glazing Manual.

3.3. INSTALLATION INTERIOR ARCHITECTURAL WALL SYSTEMS

- 3.3.1. Provide manufacturer's information and templates required for installation of work of this section, and assist or supervise, or both, the setting of anchorage devices, and construction of other work incorporated with products specified in this section in order that they function as intended.
- 3.3.2. Install work in accordance with manufacturer's instructions and recommendations, true, tightly fitted, and level or flush to adjacent surfaces, as suitable for installation. Adjust components to allow for irregularities in adjacent construction and relate accurately to finished ceiling and floor coverings.
- 3.3.3. Install frames plumb and square, securely anchored to substrates with fasteners recommended by frame manufacturer.
- 3.3.4. Use concealed installation clips to assure that splices and connections are tightly butted and properly aligned.
- 3.3.5. Secure clips to main structural components and not to snap-in or trim members.
- 3.3.6. Do not use screws or other fasteners that will be exposed to view when installation is complete.
- 3.3.7. Fit joints and junction between components tightly and in true planes, conceal joints where possible.
- 3.3.8. Once door is hung check and re-adjust, as required, all aspects including, but not limited to; operating hardware installed under this section.

3.4. AIR VAPOUR BARRIER CLOSURES

- 3.4.1. 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.
- 3.4.2. 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.

3.5. GLAZING

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

3.6. SEALANTS

- 3.6.1. 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.

3.7. HARDWARE

- 3.7.1. Install in accordance with manufacturer's installation instructions.
- 3.7.2. Accurately locate and adjust hardware to meet manufacturer's instructions. Use special tools and jigs as recommended.
 - 3.7.2.1. 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.
 - 3.7.2.2. 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.

3.7.3. Powered hardware:

3.7.3.1. 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.

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

3.8. FIELD QUALITY CONTROL

3.8.1. Professional engineer responsible for the preparation of engineered submittals shall undertake periodic field review.

3.8.2. Field reviews shall be at intervals as necessary and appropriate to be familiar with the progress and quality of such work and to determine if the work is proceeding in general conformity with the Contract Documents, including reviewed shop drawings and design calculations.

3.8.3. Field inspection and testing.

3.9. ADJUSTING AND CLEANING

3.9.1. Cleaning on completion of installation:

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

3.9.1.2. Remove protective materials.

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

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

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

END OF SECTION