

**GLAZED ALUMINUM CURTAIN WALLS****Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 07 52 00 – Modified Bituminous Membrane Roofing.
- .2 Section 07 62 15 – Sheet Metal Flashing and Miscellaneous Items.
- .3 Section 07 92 15 – Sealants.

**1.2 REFERENCES**

- .1 Glass Association of North American (GANA)
  - .1 GANA Glazing Manual - 2008.
- .2 American Architectural Manufacturers Association (AAMA)
  - .1 AAMA CW-10-15, Care and Handling of Architectural Aluminum From Shop to Site.
  - .2 AAMA 501-15, Methods of Test for Exterior Walls.
- .3 ASTM International
  - .1 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.
  - .2 ASTM D2240-15e1, Standard Test Method for Rubber Property - Durometer Hardness.
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-12.8-2017, Insulating Glass Units.
- .5 The work of this Section shall conform to the requirements of OBC, latest revision, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.
- .6 The drawings indicate the general intent only. The design of fastenings, connections and seals is the responsibility of the curtainwall installer.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- .1 Co-ordination: co-ordinate work of this Section with installation of air barrier placement, vapour retarder placement, flashing placement, and concrete coping components or materials.
- .2 Pre-Installation Meetings:
  - .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative:
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordination with other building subtrades.

**GLAZED ALUMINUM CURTAIN WALLS**

- .4 Review manufacturer's written installation instructions and warranty requirements.
- .3 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.
- .4 Ensure key personnel, site supervisor, project manager, subcontractor representatives attend.
- .5 Departmental Representative will submit written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

**1.4 QUALIFICATIONS**

- .1 The work of this Section shall be fabricated in the factory by a manufacturer with a minimum ten years' experience in the actual production of the specified products and shipped to the site.
- .2 The components of the curtainwall system shall be factory fabricated, fully engineered and delivered knockdown.
- .3 The work of this Section shall be installed by a company licensed to install curtain wall and skylight systems.
- .4 Employ only skilled tradesmen who are experienced in this work.

**1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for curtainwall components, fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.
- .2 Shop drawings:
  - .1 Submit drawings indicating large scale details for head, jamb, sill, transoms and mullions, profiles of components, elevations of units, anchorage details, location of isolation coating, weep drainage network, pressure equalization holes, methods of avoiding thermal bridging, maintenance of integrity of insulation and thermal break between subframe and structure, prevention of air infiltration, maintenance of the integrity of the air barrier, condensation control, expansion and contraction joint location and details, and field welding required.
- .3 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit one (1) representative sample of each type of specified glass units, insulated infill panels, glazing materials illustrating edge and corner.
- .4 Test reports:

**GLAZED ALUMINUM CURTAIN WALLS**

- .1 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

**1.6 CLOSEOUT SUBMITTALS**

- .1 Operation and Maintenance Data: Submit operation and maintenance data for glazed aluminum curtainwall for incorporation into manual.

**1.7 QUALITY ASSURANCE**

- .1 Regulatory Requirements:
  - .1 Conform to applicable code for acoustic attenuation, sound transmission, requirements.
- .2 Mock-ups:
  - .1 Supply vision glass light.
    - .1 Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
  - .2 Locate mock-up where directed by Departmental Representative
  - .3 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with work.
  - .4 When accepted, mock-up will demonstrate minimum standard of quality and materials for work of this Section.
  - .5 Mock-up may remain as part of finished work.

**1.8 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery and acceptance requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and handling requirements:
  - .1 Handle work of this Section in accordance with AAMA CW-10.
  - .2 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .3 Store and protect aluminum glazed curtainwall components from nicks, scratches, and blemishes.
  - .4 Protect prefinished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
  - .5 Replace defective or damaged materials with new.

**1.9 AMBIENT CONDITIONS**

- .1 Install sealants when ambient and surface temperature is above 5°C minimum.
- .2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

**GLAZED ALUMINUM CURTAIN WALLS****1.10 WARRANTY**

- .1 For work in this Section 08 44 13 - Glazed Aluminum Curtain Walls, the 12 months warranty period is extended to 24 months.
- .2 Make all necessary repair and replacements within forty-eight (48) hours of receipt of written notification.
- .3 Provide these written warranties, confirming above, issued on the corporate letterhead, signed and sealed by an authorized signing officer. The warranties will specifically reference the name of the Building, location and Departmental Representative

**Part 2 Products****2.1 SYSTEMS**

- .1 Description:
  - .1 Glazed aluminum curtainwall system includes existing tubular aluminum sections in existing self-supporting framing, all to be retained, cleaned and salvaged. Assembled system to permit re-glazing of individual glass units from exterior without requiring removal of structural mullion sections.
  - .2 All existing glazing, sealants, gaskets and accessories are to be removed and discarded.
  - .3 New system shall include shop fabricated, factory prefinished, vision glass, pressure plates, covers, related flashings, sealants, gaslets, spacers and anchorage and attachment devices.
- .2 Performance Requirements:
  - .1 Limit air infiltration through assembly to  $0.0003 \text{ m}^3/\text{s}/\text{m}^2$  of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with AAMA 501.
  - .2 Vapour seal with interior atmospheric pressure of 25 mm sp, 22°C, 40% RH: no failure.
  - .3 Water leakage: None, when measured to ASTM E1105.
  - .4 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.
  - .5 Design and size components to withstand dead and live loads caused by pressure and suction of wind, snow and hail for sloped glazing, acting normal to plane of system as calculated in accordance with NBC to a design pressure of 0.90 kPa as measured to ASTM E330.
  - .6 Size glass units to match existing.
  - .7 Ensure system allows for expansion and contraction within system components when temperature range is 95°C over 12 hour period without causing detrimental effect to system components.
  - .8 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

**GLAZED ALUMINUM CURTAIN WALLS**

- .9 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
  - .1 Position thermal insulation on exterior surface of air barrier and vapour retarder.
- .10 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

**2.2 MATERIALS**

- .1 Design criteria:
  - .1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
    - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
  - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to design pressure of 0.80 kPa.
  - .3 Limit glass deflection to flexural limit of glass with full recovery of glazing materials.
- .2 Insulating glass units:
  - .1 Insulating glass units: To CAN/CGSB-12.8, double unit, 25 mm overall thickness.
  - .2 Standard IGU construction.
    - .1 Exterior lite: 6 mm laminated glass to CAN/CGSB-12.3, 20% green tint.
    - .2 Interior lite: Type 2 tempered 6 mm clear glass.
  - .3 Low emissivity (LOW E) glass, thickness as indicated - Metallic coating: hard, pyrolitic on #2 face.
  - .4 12.7 mm warm-edge spacer

**2.3 ACCESSORIES**

- .1 Setting blocks: Neoprene, 70-80 Shore A durometer hardness to ASTM D2240, minimum 100 mm x 6 mm high width to suit glazing method, glass light weight and area. Design blocks to not restrict water flow to weep holes.
- .2 Spacer shims: Neoprene, 70-80 Shore A durometer hardness to ASTM D2240, 75 mm long x 9 mm high x 2.4 mm thick. Self adhesive on one face.
- .3 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; self-adhesive, black colour.
- .4 Glazing splines: Resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot.
- .5 Glazing clips: Manufacturer's standard type.

**GLAZED ALUMINUM CURTAIN WALLS**

- .6 Primers, sealers and cleaners: To glass manufacturer's recommendations.
- .7 Sealant for glazing – Neutral one part silicone sealant.

**2.4 COMPONENTS**

- .1 Flashings, drip edges and exterior panning trim: 2.0 mm thick aluminum, finish as selected, to match curtainwall mullion sections where exposed, secured with concealed fastening method, complete with joint covers, jamb drip deflectors, chairs and caps and anchoring devices.
- .2 Pressure plates and covers:
  - .1 Pre-drilled aluminum extrusions to profiles to match existing. Profile to be stiff enough to withstand in-service loadings without deformation.
  - .2 Caps to be aluminum with profile allowing slipped connection to plates, cut to match exact required length.
- .3 Self-adhered membrane: To CSA A123.22, self-adhering membrane consisting of SBS rubberized asphalt compound laminated to a polyethylene film. Minimum thickness 1 mm.
- .4 Spray foam insulation: To be one or two component spray polyurethane foam to suit site conditions. Foam to be flame retardant grade.
- .5 Insulation for glazing spacer: Extruded polystyrene, to CAN/ULC S701, Type 4.

**Part 3 Execution****3.1 EXAMINATION**

- .1 Verification of conditions: Verify conditions of existing substrates are acceptable for aluminum curtainwall installation.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Verify dimensions, tolerances, and method of attachment with other work, by field measurement before fabrication. Show recorded measurements on shop drawings. Co-ordinate field measurements and fabrication schedule with construction progress to avoid construction delays.
  - .3 Verify wall openings and adjoining roof flashing materials are ready to receive work of this Section.
  - .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
  - .6 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

**GLAZED ALUMINUM CURTAIN WALLS****3.2 GENERAL INSTALLATION**

- .1 Install sloped glazing system in accordance with manufacturer's instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Use thermal isolation where components penetrate or disrupt building insulation.
- .4 Install sill flashings.
- .5 Install eave edge flashings at sloped glazing system.
- .6 Separate aluminum materials from sources of corrosion or electrolytic action contact points.
- .7 Each lite of glass shall be compartmentalized using joint plugs and sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.
- .8 Co-ordinate installation of fire stop insulation, at each floor slab edge and intersection with vertical construction where indicated.
- .9 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.
- .10 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .11 Install glass and infill panels, to glazing method required to achieve performance criteria exterior wet/dry method of glazing. Place sealant on the up-slope side of the pressure plate cover caps; finish the surface with a slope to encourage drainage over the cap. Cover caps to conceal screws and ensure continuous sightline.
- .12 Install perimeter sealant to method required to achieve performance criteria. Type, backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealants.

**3.3 GLASS INSTALLATION**

- .1 Remove protective coatings, clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.
- .4 Place setting blocks as per manufacturer' instructions.
- .5 Install glass to ensure full bearing and contact with setting block.

**GLAZED ALUMINUM CURTAIN WALLS**

- .6 Install removable stops, without displacing glazing tape or sealant. Exert pressure as required to provide full continuous contact.
- .7 Provide edge clearance of at least 3 mm in all locations.
- .8 Insert spacer shims to centre glass in space. Place shims at 600 mm centres and keep 6 mm below sight line.

**3.4 GLAZING INSTALLATION: INTERIOR DRY METHOD (TAPE AND TAPE)**

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/3 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.
- .8 For gaskets – ensure adhesion and that positioning does not impede designed drainage.

**3.5 FINISHING**

- .1 Make good damage to adjacent finished surfaces.
- .2 Leave glass whole and without cracks, scratches or other defects, and with settings in perfect condition at completion, to the approval of the Departmental Representative. Remove rejected, broken, or damaged glass due to defective materials or improper setting and replace with perfect materials. Units producing distorted vision shall be rejected and replaced at the reasonable discretion of the Departmental Representative.

**3.6 CLEANING**

- .1 Progress cleaning:
  - .1 Leave Work area clean at end of each day.
  - .2 Remove protective material from prefinished aluminum surfaces.
  - .3 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.



**GLAZED ALUMINUM CURTAIN WALLS**

- .4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.
- .5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

**3.7 PROTECTION**

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

**END OF SECTION**