

1 General

1.1 **SECTION INCLUDES**

- .1 Design, labour, Products, tool, equipment and services necessary for single glazed system work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- .2 ASTM A276, Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
- .3 ASTM C920, Specification for Elastomeric Joint Sealants.
- .4 ASTM F738M, Specification for Stainless Steel Metric Bolts, Screws, and Studs.
- .5 CAN/CGSB-12.20-M, Structural Design of Glass for Buildings.
- .6 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

1.3 **DESIGN REQUIREMENTS**

- .1 Design glass balustrade systems to CAN/CGSB-12.20-M. Perform stress analysis. Design units to accommodate live, dead, lateral, wind, seismic, handling, transportation, and erection loads.
- .2 Design glass railings to withstand minimum horizontal and vertical loads as required to meet requirements of authorities having jurisdiction. In no instance shall load design of railings be less than 2.2 kN/m horizontally and 1.5 kN/m vertically.

1.4 **SUBMITTALS**

- .1 Shop Drawings:
  - .1 Submit Shop Drawings in accordance with Section 01 10 10 indicating:
    - .1 Plans, sections, details, type of extrusions, profiles, thicknesses, seals, finishes, panels, operating components, related flashings, closures, fillers, and end caps, and sealants.
    - .2 Products and glazing types.
    - .3 Anchorage inserts, system installation tolerances.
    - .4 Section and hardware reinforcement, anchorage, assembly fixings.
    - .5 Detailing, locations, and allowances for movement, expansion, contraction.
- .2 Samples:
  - .1 Submit two samples of following in accordance with Section 01 10 10.
    - .1 250 mm long samples of each type of stainless steel and finish.
    - .2 250 x 200 mm samples of glass.

- .3 Reports/Certificates:
  - .1 Submit documentation to substantiate ten years of experience in glazed railing manufacture and installation.
  - .2 Submit written manufacturer's certificate certifying compliance with the specifications.
- .4 Close-out submittals: Submit data for incorporated into the Operations and Maintenance Manual as part of Section 01 10 10.

**1.5 QUALITY ASSURANCE**

- .1 Retain a licensed Professional Engineer, registered in Province of Ontario, to perform following services for glazed railing system Work:
  - .1 Design glass, stainless steel supporting elements, stainless steel railing and supporting elements to resist live, dead, lateral, or seismic loads.
  - .2 Review, stamp, and sign Shop Drawings.
  - .3 Conduct on-Site inspections and prepare and submit inspection reports.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Protect surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Do not remove before final cleaning of building.

**1.7 EXTENDED WARRANTY**

- .1 Submit a extended warranty for glazed railing system work in accordance with General Conditions, except that warranty period is extended to 5 years.
  - .1 Warrant against failure to meet the design criteria and requirements.
  - .2 Coverage: Complete replacement including affected adjacent Work.

**2 Products**

**2.1 ACCEPTABLE MANUFACTURER(S) AND SYSTEM(S)**

- .1 Glazed railing system:
  - .1 Stainless steel brackets, bars and flanges complete with glazed infill panels.
  - .2 System to be complete with all components and accessories as required for complete and secure installation
  - .3 Material: Type 304 stainless steel with brushed finish.
  - .4 System is composed of heat strengthened laminated glass mounted at the base of the wall onto all stainless steel components. Individual sheets of glass are bonded to each other with clear silicone sealant. The rail and mounting components are fixed to glass.
  - .5 Acceptable manufacturer: C.R. Laurence or approved alternative.

**2.2 MATERIALS**

- .1 General: All materials under Work of this Section, including but not limited to, sealants and coatings are to have low VOC content limits.
- .2 Stainless steel rails: ASTM A167, Type 316. Size as shown.
- .3 Stainless steel shapes: ASTM A276, Type 316. Sizes and shapes as shown.
- .4 Reinforcements and anchors: ASTM A167, Type 316. Size as shown.
- .5 Glass and glazing materials: In accordance with Section 08 80 00.
- .6 Glazing gasket: Clear silicone between glass sheets at vertical joints.
- .7 Anchors, clips, and angles: Stainless steel.
- .8 Screws, bolts and other fasteners: ASTM F738M; Stainless Steel Type 316.

**2.3 FABRICATION**

- .1 Fabricate sections true to detail, free from defects impairing appearance, strength and durability.
- .2 Fabricate, fit, and secure framing joints and corners accurately, with flush surfaces, and hairline joints.
- .3 Conceal anchors, reinforcement and attachments from view. Fabricate reinforcement in accordance with Contract Documents.
- .4 Do not expose manufacturer's identification labels on glazed railing assemblies.

**3 Execution**

**3.1 EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

**3.2 INSTALLATION**

- .1 Install glazed railing system work in accordance with reviewed Shop Drawings, manufacturer's written instructions.
- .2 Install Work of this Section securely, in correct location, level, square, plumb, at proper elevations, free of warp or twist.

- .3 Refer to Contract Drawings for glazing type locations. Install glazing in accordance with Section 08 80 00.
- .4 Remove damaged or unacceptable Products and assemblies from Site and replace to Engineer's acceptance.
- .5 Install glass presence markers, in two cross stripes extending from diagonal corners. Maintain markers until final clean-up.

### **3.3 ERECTION TOLERANCES**

- .1 Tolerances: Non-cumulative.
  - .1 Maximum variation from plumb: 1.5 mm/3 m non-cumulative or 12 mm/30 m, whichever is less.
  - .2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.
  - .3 Vertical and horizontal positions: +/- 3 mm.
  - .4 Racking of face: 6 mm, nil in elevation.
  - .5 Maximum perimeter sealant joint between glazed railings: 12 mm.

### **3.4 CLEANING**

- .1 Maintain glazed railing work, inside and outside, in clean condition throughout construction period.
- .2 Remove labels, protective material, and glass presence markers from prefinished surfaces.
- .3 Wash glazed railing work with solution of mild detergent in warm water, with particular attention to recesses and corners. Wipe surfaces clean and dry.

END OF SECTION