

Part 1 General

1.1 SECTION INCLUDES

- .1 Floor Supported Structural Glass Guardrail panels at edge of floor openings as indicated.
- .2 Integral Stainless Steel Handrails and Steel plate handrail / glazing support brackets.
- .3 Installation Accessories.

1.2 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealants.
- .2 Section 09 91 23 – Interior Painting

1.3 REFERENCES

- .1 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.
- .2 ASTM C1048 - 04 - Standard Specification for Heat-Treated Flat Glass Kind HS, Kind FT Coated and Uncoated Glass
- .3 National Building Code of Canada 2010 - Part 4
- .4 ASTM B 221/ASTM B221M, - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .5 ASTM A 167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .6 ASTM D2240-02a, Standard Test Method for Rubber Property - Durometer Hardness.

1.4 PERFORMANCE REQUIREMENTS

- .1 Structural performance of guardrails: provide structural glass guardrail panels capable of withstanding the following structural loads as indicated in the NBCC 2010, article 4.1.5.15, without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections:
 - .1 Top rail of guards: capable of withstanding the following loads applied as indicated:
 - .1 Concentrated load of 3.0kn applied at any point and in any direction.
 - .2 Uniform load of 1.5kn/m applied vertically downward.
 - .3 Concentrated and uniform loads above need not be assumed to act simultaneously.
 - .2 Thermal movements: allow for thermal movements resulting from the change in ambient and surface temperatures by preventing buckling, opening of joints, over stressing of components, failure of connections, and other detrimental effects.

1.5 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: provide product data for Glass, handrail components and installation accessories.

- .3 Shop drawings: show fabrication and installation details for glass panels and Stainless Steel Fascia and Stringer covers.

- .1 Include plans, elevations, sections, details, and attachments to other work.

- .2 Indicate layout of panel joints for departmental representative approval

- .4 Product test reports: indicating products comply with requirements, based on comprehensive testing of current products.

1.6 QUALITY ASSURANCE

- .1 Source limitations: obtain all structural glazing and related accessories through one source form a single manufacturer.

1.7 PROJECT CONDITIONS

- .1 Field measurements: verify glazing dimensions by field measurements before fabrication and indicate measurements on shop drawings.

- .2 Coordinate fabrication schedule with construction progress to avoid delaying the work.

1.8 COORDINATION

- .1 Verify and confirm acceptability and compatibility of details for anchorage provided by other trades with the work to be provided and installed by this section.

- .2 Submission of Shop Drawings for approval will be considered acceptance by the Supplier of materials and installation of those materials specified in this Section.

Part 2 Products

2.1 STRUCTURAL GLASS GUARDRAIL PANELS

- .1 Tempered glass: ASTM C 1048, kind FT (fully tempered), condition A (uncoated), Type 1 (transparent glass, flat). Quality Q3 (glazing select). Provide products complying with requirements indicated below for class, thickness, and manufacturing process that have been tested for surface and edge compression according to ASTM C1048 and for impact strength according to CAN/CGSB-12-1 M90 for category II materials.

- .1 Clear glass: class I (clear).

- .2 Thickness: 13mm

- .3 Manufacturing process: manufacture fully tempered glass by vertical tong-held process

- .4 Panel edge treatment:

- .1 polished with "pencil edge" radius

- .2 Provide safety glass permanently marked with certification label of safety glazing certification council or another certification agency, acceptable to authorities having jurisdiction.

- .3 Panel joints and spacing:

- .1 13mm clear, open space between panels

- .2 142mm average joint spacing, refer to drawings for panel sizes
- .3 Panel joints in a single run of guardrail are to be equally spaced, unless noted otherwise.
- .4 Joint spacing and location are to be reviewed by Departmental Representative prior to fabrication.

2.2 SETTING SYSTEM

- .1 “Dry Glazing” setting process, using setting blocks and tapered shims.
- .2 Setting Blocks: Neoprene, 80 to 90 shore A durometer hardness.
- .3 Shims: Neoprene, 50 to 60 shore A durometer hardness.

2.3 INSTALLATION COMPONENTS AND ACCESSORIES

- .1 Shoe Base: 64mm wide x 105mm high channel profile designed to hold 13mm tempered glass panels, fabricated from 6063-T52 aluminum, pre-drilled for mounting as indicated on drawings. Acceptable Product: B5S shoe base by CR Laurence Company.
- .2 Interior Shoe Base Anchorage: Purpose-made Stainless Steel Fasteners c/w weld blocks where indicated and/or required by shoe base manufacturer.
- .3 Shoe Base Fascias and Stringer Covers: Sheet metal cladding added to exposed shoe base sections and stringers as indicated on drawings. Adhere with double-sided tape and/or silicone adhesive. Provide end caps where ends of shoe base sections are exposed: Type 304 Stainless Steel, Brushed Finish. Shapes, Profiles, Widths and Exposures as per drawings.
- .4 Standoff: Brushed Stainless Steel Glass Rail Standoff Base and Cap – 44mm projection by CR Laurence Company.
- .5 Sealant at joint between Glass Panels and Shoe Base Cladding: Backer Rod and Silicone sealant to Section 07 92 00 – Joint Sealants.

2.4 HANDRAIL COMPONENTS

- .1 Handrail Brackets: Metal Fabrication as per drawings
- .2 Stainless Steel handrails: 75mm O.D

Part 3 Execution

3.1 EXAMINATION

- .1 Examine sub-structure provided by other trades for suitability and conformance to details.
- .2 Report any problems to the consultant prior to installation.
- .3 Take final field dimensions for glass panel fabrication

3.2 GLASS PANEL FABRICATION

- .1 Cut tempered glass to final size and shape before heat treatment; provide required holes for handrail brackets, and allow for proper edge clearance and bite on glass. Provide thickness indicated, but not less than that required to support structural loads.

3.3 INSTALLATION

- .1 Set Shoe Base level, square, and in conformance to drawings.
- .2 Use 'weld blocks' at interior applications to simplify installation to substructure by others. Field weld shoe base assembly to substructure to resist forces applied to guardrail assembly.
- .3 Use wedge-bolt anchors or epoxy anchors at exterior applications direct to concrete.
- .4 Set glass panels plumb and square in shoe base using neoprene setting blocks and shims.
- .5 All tong marks are to be concealed within the shoe base, no visible tong marks will be accepted.
- .6 Adjust panels to maintain alignment and consistent panel joint width.
- .7 Install glazing to manufacturer's recommendations with tapered wedges. allow space for finish bead of silicone.
- .8 Install stainless steel fascias and stringer covers to locations as indicated on drawings. no visible fasteners will be accepted
- .9 Joints in stainless steel fascias and stringer covers shall be hairline and supported on solid backing.
- .10 Install finish bead of silicone sealant to Section 07 92 00 - Joint Sealants between glass guardrail panels and base shoe / base shoe cladding. Fill void between panels at panel joint locations.
- .11 Install handrail brackets to locations indicated on drawings.
- .12 Install wooden handrail in longest lengths available and practical. All joints are to be mitred, glued with biscuits, and made hairline. Arrange handrail sections to maintain similar grain direction, figure, and coloration as adjacent section. Sand smooth ready for field finish as per Section 09 91 23 – Interior Painting.

3.4 PROTECTION

- .1 Protect glass panels and handrails from damage during construction period with temporary protective coverings. remove protective coverings at the time of substantial completion.

3.5 CLEANING

- .1 Remove glazing materials and silicone from finish surfaces.
- .2 Remove temporary labels after Work is complete.
- .3 Clean glass.

END OF SECTION