

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C542-05, Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D790-07e1, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - .3 ASTM D1003-07e1, Standard Test Method for Haze and Luminous Transmittance of Plastics.
 - .4 ASTM D1929-96 (R2001)e1, Standard Test Method for Determining Ignition Temperature of Plastics.
 - .5 ASTM D2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
 - .6 ASTM E84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .8 ASTM F1233-08, Standard Test Method for Security Glazing Materials and Systems.
- .2 Canada Green Building Council (CaGBC): N/A
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
 - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.4-M91, Heat Absorbing Glass.
 - .5 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.
 - .6 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .7 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.
 - .8 CAN/CGSB-12.9-M91, Spandrel Glass.
 - .9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
 - .10 CAN/CGSB-12.11-M90, Wired Safety Glass.
 - .11 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.
 - .12 CAN/CGSB-12.13-M91, Patterned Glass.
- .4 Environmental Choice Program (ECP)
 - .1 CCD-045-95 (R2005), Sealants and Caulking Compounds.
- .5 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual – current addition.
 - .2 GANA Laminated Glazing Reference Manual – current addition.

- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

- .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:

- .1 Convene pre-installation meeting 1 week prior to beginning on-site installation work of this Section, with Contractor's Representative, MUFD Representative and Consultant in accordance with Section 01 31 19 - Project Meetings to:

- .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.

- .2 Arrange for site visit with Consultant and MUFD Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.

- .3 Ensure key personnel attend.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.

- .3 Shop Drawings:

- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia, Canada.

- .4 Samples:

- .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate 300 mm square size samples of all glazing units and sealant material.

- .5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

- .6 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

- .1 Submit testing analysis of glass under provisions of Section 01 45 00 - Quality Control.

- .2 Submit shop inspection testing for glass.

- .7 Sustainable Design Submittals: N/A

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

1.5 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up to include glazing, and perimeter air barrier and vapour retarder seal.
 - .3 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
 - .2 For testing to determine compliance with performance requirements. Perform tests as follows:
 - .4 Locate where directed.
 - .5 Allow 24 hours for inspection of mock-up before proceeding with work.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer s written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer s name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors off ground in dry location and in accordance with manufacturer s recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
 - .3 Protect prefinished aluminum surfaces with wrapping strippable coating.
 - .4 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section

1.7 AMBIENT CONDITIONS

- .1 Ambient Requirements:
 - .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
 - .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

Part 2 Products

2.1 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 in accordance with ASTM E330 and as per NBC.
 - .3 Glass that is used or functions as a guard as defined in the National Building Code and Nova Scotia Building Code (current version), shall meet or exceed the standards and recommendations of CSA A500.
 - .4 Safety Glass: shall meet or exceed criteria and standards established by CGSB 12.1 and ANSI Z97.1 CLASS A.
 - .5 Glazing installation shall meet or exceed requirements of the National Building Code 2015 and the Nova Scotia Building Code. , Limit glass deflection to 1/175 with full recovery of glazing materials.
 - .6 Glazing for Fire-Rated Door and Window Assemblies: Glass tested per NFPA 252 and NFPA 257, as applicable for assemblies complying with NFPA 80 and listed and labelled per requirements of authorities having jurisdiction.
 - .7 Edge Treatment: Concealed edges – flat belt ground and seamed. Exposed edges- flat polish with arris.

2.2 FLAT GLASS MATERIALS

- .1 Flat Glass:
 - .1 Tempered Safety Glass:

Tempered Glass to CAN/CGSB-12.1, transparent, glazing quality, thickness as required to meet ANSI Z97.1 Class A but not less than 6mm thick. (full height glazing panes minimum thickness shall be 10mm thickness)

 - .1 Design: to meet and exceed requirements of the National Building Code 2015 and the current Nova Scotia Building Code, and CSA A500.
 - .2 Type: 1 – tempered;
 - .3 Category: ANSI Z97.1 Class A
 - .2 Laminated Safety Glass: DOORS AND FULL HEIGHT (LARGE) APERTURES.

Laminated Glass to ASTM C1172, transparent, glazing quality with minimal inclusions, thickness as required to meet ANSI Z97.1 Class A but not less than 8mm thick. (full height glazing panes minimum thickness shall be 10mm thickness)

 - .1 Design: to meet and exceed requirements of the National Building Code 2015 and the current Nova Scotia Building Code, and CSA A500.

- .2 Tempered to CAN/CGSB-12.1
- .3 Laminated to ASTM C1172
- .4 Category: ANSI Z97.1 Class A

- .4 Low-Emissivity (LOW-e) coating:
 - .1 To be factory applied to 2nd surface in double glazed units.
 - .2 Basis of design: Cardinal LoE³ – 366 or equal/better properties/
performance characteristics.
Acceptable Alternatives: PPG Solarban 70XL (2)+ Clear, Guardian
ClimaGuard 62/27, Viracon VRE 1-65, Prelco 366.

2.3 DUAL-SEALED INSULATING GLASS UNITS

- .1 Insulating Glass Units:
 - .1 Insulating glass units: to CAN/CGSB-12.8, double units
 - .1 Double glazed units with low conductance warm edge spacer
 - .2 Glass thickness: 6mm Tempered (both sides) (or thicker to suit safety requirements and location); thickness of sealed units min. 25mm
 - .3 Colour: Clear.
 - .4 Light Transmittance: min 69%
 - .5 Shading Coefficient: 0.46
 - .6 Inert Gas Fill: Argon Gas Filled Sealed Units.
 - .7 Winter u/value (Argon): 1.4 (metric)
 - .8 Summer u/value (Argon): 1.2 (metric)
 - .9 Reflectance: 11% out and in
 - .10 Solar: 29%
 - .11 Glass coating: LoE as noted above
 - .2 Laminated Insulating glass units: Glazed Doors and Large Aperture Windows.
 - .1 To CAN/CGSB-12.8, double units
 - .2 Double glazed units with low conductance warm edge spacer
 - .3 Glass thickness: 6mm Tempered (outer sides) (or thicker to suit safety requirements and location) with 8mm Laminated (inner side); thickness of sealed units min. 27mm
 - .4 Colour: Clear.
 - .5 Light Transmittance: min 69%
 - .6 Shading Coefficient: 0.46
 - .7 Inert Gas Fill: Argon Gas Filled Sealed Units.
 - .8 Winter u/value (Argon): 1.4 (metric)
 - .9 Summer u/value (Argon): 1.2 (metric)
 - .10 Reflectance: 11% out and in
 - .11 Solar: 29%

- .12 Glass coating: LoE as noted above
- .13 Impact Safety rating: ANSI Z97.1 Class A.

- .2 Plastic Film: N/A
- .3 Sealant: Silicone glazing Sealants in accordance with Section 07 92 00 - Joint Sealants.

2.4 ACCESSORIES

- .1 Setting blocks: neoprene / silicone, 80-90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area length of 25 mm for each square metre of glazing. minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height.
- .2 Spacer shims: neoprene / silicone, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. 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;
 - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2 %, designed for compression of 25 %, to effect an air and vapour seal;
- .4 Glazing splines: resilient polyvinyl chloride / silicone, extruded shape to suit glazing channel retaining slot,
- .5 Glazing clips: manufacturer s standard type.
- .6 Lock-strip gaskets: to ASTM C542.

Part 3 Execution

3.1 COMPLIANCE

- .1 Install work in accordance with the quality assurance provisions specified in this section and manufacturers instructions, data sheets, and standard details.
- .2 Size glass to National Building Code standard requirements and verify glass for openings are correctly sized and are within allowable tolerances. Install glass with full contact and adhesion at perimeter. Maintain edge clearance recommendations by glass manufacturer.
- .3 Ensure weep drainage from all exterior glazing channels and framing.
- .4 Adhere to the guidelines of the Insulating Glass Manufactures Alliance (IGMA)

3.2 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer s written instructions.
 - .1 Verify that openings for glazing are correctly sized and within tolerance.

- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
- .3 Visually inspect substrate in presence of MUFD Representative and/or Consultant.
- .4 Inform Consultant and/or MUFD Representative of unacceptable conditions immediately upon discovery.
- .5 Proceed with installation only after unacceptable conditions have been remedied

3.3 PREPARATION

- .1 Ensure all wood backing rebates and stops properly primed and finished, coordinate with all relevant specification sections.
- .2 Ensure all glazing rebates are smooth and true. Free from projections: nails, screws with fastenings properly set to prevent contact with glass.
- .3 Ensure all stops, splines, and glazing accessories are cut to length and proper size and type for specific glazing.
- .4 Clean contact surfaces with solvent and wipe dry.
- .5 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .6 Prime surfaces scheduled to receive sealant.

3.4 INSTALLATION: EXTERIOR - DRY METHOD (PREFORMED GLAZING)

- .1 Manufacturer s Instructions: comply with manufacturer s written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Perform work in accordance with GANA Glazing Manual / GANA Laminated Glazing Reference Manual for glazing installation methods.
- .3 Cut glazing spline to length; install on glazing light. Seal corners by butting spline and sealing junctions with sealant.
- .4 Place setting blocks at ¼ points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- .6 Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- .7 Trim protruding tape edge.

3.5 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

- .1 Perform work in accordance with GANA Glazing Manual / GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 INSTALLATION: EXTERIOR - WET METHOD (SEALANT AND SEALANT)

- .1 Perform work in accordance with GANA Laminated Glazing Reference Manual / GANA Glazing Manual for glazing installation methods
- .2 Place setting blocks at 1/4 points and install glazing light or unit.
- .3 Install removable stops with glazing centred in space by inserting spacer shims both sides at 600 mm intervals, 6 mm below sight line.
- .4 Fill gaps between glazing and stops with sealant to depth of bite on glazing, maximum 9 mm below sight line to ensure full contact with glazing and continue air and vapour seal.
- .5 Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .1 Remove traces of primer, caulking.
 - .2 Remove glazing materials from finish surfaces.
 - .3 Remove labels.
 - .4 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer s instructions.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .2 Waste Management: separate waste materials for recycling
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 After installation, mark each light with an X by using removable plastic tape or paste.
 - .1 Do not mark heat absorbing or reflective glass units.

- .3 Repair damage to adjacent materials caused by glazing installation.

3.9 SCHEDULE

- .1 REFER to Architectural Drawings.

END OF SECTION