
PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS** .1 Windows – Section 08 50 00.
- 1.2 REFERENCES** .1 ASTM International
 - .1 ASTM D2240-05(2010), Standard Test Method for Rubber Property - Durometer Hardness.
 - .2 ASTM E330-02(2010), Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .2 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .3 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.
- .3 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual - 2008.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS** .1 Submit in accordance with Section 01 33 00.
- .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 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- 1.4 CLOSEOUT SUBMITTALS** .1 Submit in accordance with Section 01 78 00.
- .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.
 - .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.
- .4 Locate where directed.
- .5 Allow 48 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. Approved mock-up may remain as part of finished work.

**1.6 DELIVERY,
STORAGE AND
HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 and 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect glazing from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

**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 to ASTM E330.
 - .3 Limit glass deflection to flexural limit of glass with full recovery of glazing materials.
- .2 Low Emissivity "Low E" glass:
 - .1 Solar heat gain Coefficient: 0.39
 - .2 Visible light transmittance: 70%.
 - .3 Shading co-efficient: 0.45
 - .4 U-Value: winter night 0.29 maximum, summer day 0.27 maximum
 - .5 Acceptable product: Solarban 60 by PPG, or accepted equal.

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- .3 Insulating Glass Units:
 - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25 mm overall thickness.
 - .1 Glass: clear float glass, to CAN/CGSB-12.3.
 - .2 Glass thickness: 6 mm each light.
 - .3 Inter-cavity space thickness: 13 mm with low conductivity spacers.
 - .4 Glass coating: surface number 2, "Low E".
 - .5 Inert gas fill: argon.
- 2.2 ACCESSORIES**
- .1 Setting blocks: neoprene or silicone, 80-90 Shore A durometer hardness to ASTM D2240, dimensions to suit glazing method, glass light weight and area.
 - .2 Spacer shims: neoprene or silicone, 50-60 Shore A durometer hardness to ASTM D2240, dimensions 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; dimensions to suit application; black colour.
 - .4 Glazing splines: resilient silicone, extruded shape to suit glazing channel retaining slot, black colour.
- PART 3 - EXECUTION**
- 3.1 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 Departmental Representative.
 - .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .5 Proceed with installation only after unacceptable conditions have been remedied.
- 3.2 PREPARATION**
- .1 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.
- 3.3 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 for glazing installation

methods.

- .3 Cut glazing tape to length; install on glazing light. Seal corners by butting tape and sealing junctions with sealant.
- .4 Place setting blocks at 1/4 1/3 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 tape. Exert pressure for full continuous contact.
- .7 Trim protruding tape edge.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .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.

3.5 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.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- .1 Joint Sealants - Section 07 92 00
- .2 Rough Carpentry - Section 06 10 00
- .3 Sheet Metal Flashing and Trim - Section 07 62 00
- .4 Glazing - Section 08 80 50

1.2 REFERENCES

- .1 CSA International
 - .1 AAMA/WDMA/CSA-101/I.S.2/A440-08, NAFS - North American Fenestration Standard/ Specification for Windows, Doors and Skylights.
 - .2 AAMA/WDMA/CSA-101/I.S.2/A440S1-09, Canadian Supplement to AAMA/WDMA/CSA-101/I.S.2/ A440-08, NAFS - North American Fenestration Standard/Specification for Windows, Doors and Skylights.
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for windows 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 Ontario, Canada.
 - .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, exterior trim, elevations of unit, anchorage details, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Submit one representative model of each type window.
 - .3 Include frame, sill, glazing and weatherproofing method, and surface finish. Show location of manufacturer's nameplates.
 - .4 Include 150 mm long samples of head, jamb, sill, mullions to indicate profile.
- .5 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
 - .1 Windows classifications.



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- .2 Enamelled finish, weathering characteristics.
 - .3 Air tightness.
 - .4 Water tightness.
 - .5 Wind load resistance.
 - .6 Condensation resistance.
 - .7 Mullion deflection - combination windows.
 - 1.4 CLOSEOUT SUBMITTALS
 - .1 Submit in accordance with Section 01 78 00.
 - .2 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.
 - 1.5 QUALITY ASSURANCE
 - .1 Certifications: 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.
 - .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.
 - .4 Locate where directed.
 - .5 Allow 48 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. Approved mock-up may remain as part of finished work.
 - 1.6 DELIVERY, STORAGE AND HANDLING
 - .1 Deliver, store and handle materials in accordance 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect windows from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- PART 2 – PRODUCTS**
- 2.1 MATERIALS
 - .1 Materials: to AAMA/WDMA/CSA-101/I.S.2/A440 and AAMA/WDMA/CSA-101/I.S.2/A440S1, supplemented as follows:



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- .2 Acceptable system: Shadowline 970 by Alumicor, or accepted equal.
 - .3 All windows by same manufacturer.
 - .4 Main frame: aluminum, thermally broken.
 - .5 Glass: in accordance with Section 08 80 50.
 - .6 Isolation coating: alkali resistant bituminous paint.
 - .7 Sealants:
 - .1 VOC limit 250 g/L maximum.
- 2.2 WINDOW TYPE AND CLASSIFICATION**
- .1 Type:
 - .2 Fixed: with removable insulating glass.
 - .2 Classification rating: to AAMA/WDMA/CSA-101/ I.S.2/A440 and AAMA/WDMA/CSA-101/I.S.2/A440S1.
 - .1 Air tightness: A3 - Fixed.
 - .2 Water Tightness: B4 minimum
 - .3 Wind load resistance: C2.
 - .4 Condensation resistance: Temperature Index, I73 minimum.
 - .5 Glazing: G2.
- 2.3 FABRICATION**
- .1 Fabricate in accordance with AAMA/WDMA/CSA- 101/I.S.2/A440 and AAMA/WDMA/CSA-101/I.S.2/ A440S1 supplemented as follows:
 - .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
 - .3 Brace frames to maintain squareness and rigidity during shipment and installation.
 - .4 Finish steel clips and reinforcement with Coating Grade 55 minimum 380 g/m² zinc coating to ASTM A123/A123M.
- 2.4 ENAMEL COATING**
- .1 Enamel coating: in accordance with AAMA/WDMA/ CSA-101/I.S.2/A440 and AAMA/WDMA/CSA-101/I.S.2/ A440S1, including appendices, supplemented as follows:
 - .1 Standard colour to Departmental Representative's selection.
- 2.5 ISOLATION COATING**
- .1 Primers, Paints, and Coatings: in accordance with manufacturer's recommendations for surface conditions.
 - .2 Isolate aluminum from following components, by means of isolation coating:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.
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2.6 GLAZING

- .1 Glaze windows in accordance with Section 08 80 50.

PART 3 – EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Window installation:
 - .1 Install in accordance with AAMA/WDMA/CSA- 101/I.S.2/A440 and AAMA/WDMA/CSA-101/I.S.2/ A440S1.
 - .2 Arrange components to prevent abrupt variation in colour.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

3.4 PROTECTION

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

END OF SECTION



PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS .1 Section 08 50 00 - Windows
- 1.2 REFERENCES .1 CSA International
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O141-05(R2009), Softwood Lumber..2 Canadian Lumber Standards Accreditation Board (CLSAB).
 - .3 National Lumber Grades Authority (NLGA).
- 1.3 ACTION & INFORMATIONAL SUBMITTALS .1 Submit in accordance with Section 01 33 00.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.4 QUALITY ASSURANCE .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- 1.5 DELIVERY, STORAGE AND HANDLING .1 Deliver, store and handle materials in accordance 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 off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

- 2.1 FRAMING STRUCTURAL & PANEL MATERIALS .1 Lumber: softwood, S4S, moisture content S-DRY graded and stamped in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber..2 Furring, blocking, nailing strips, strapping, grounds, rough bucks, and sleepers: NLGA spruce, pine or fir (SPF), 121c. and pine, 113d.
- 2.2 ACCESSORIES .1 Nails, spikes and staples: to CSA B111.
 - .2 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
 - .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.
 - .4 Fastener Finishes:



- .1 Galvanizing: use galvanized fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Apply damp proofing over concrete or masonry on which wood framing bears.
- .2 Install members true to line, levels and elevations, square and plumb to a tolerance of 1:600 and rigidly secure in place.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Install furring and blocking as required to space-out and support work as required.
- .6 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .7 Install wood backing, nailers, and other wood supports as required and secure using galvanized steel fasteners.
- .8 Install sleepers as indicated.
- .9 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- .10 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .11 Countersink bolts where necessary to provide clearance for other work.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 PROTECTION

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

END OF SECTION



PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Windows – Section 08 50 00.
- .2 Joint Sealants - Section 07 92 00.

1.2 REFERENCES

- .1 The Aluminum Association Inc. (AAI)
 - .1 AAI-Aluminum Sheet Metal Work in Building Construction-[2002].
- .2 Canadian General Standards Board (CGSB)
 - .2 CAN/CGSB-93.1-[M85], Sheet Aluminum Alloy, Prefinished, Residential.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA A123.3-[05], Asphalt Saturated Organic Roofing Felt.
 - .2 CSA B111 Wire Nails, Spikes and Staples.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets.
- .3 Samples:
 - .1 Submit 50 x 50 mm samples of each type of sheet metal material, finishes and colours.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- .1 Aluminum sheet: proprietary utility sheet, plain, 1.6 mm minimum thickness.

2.2 PREFINISHED ALUMINUM SHEET

- .1 Finish: factory applied coating to CAN/CGSB-93.1 supplemented and amended as follows:
 - .1 Colour selected by Departmental Representative from manufacturer's standard range.
 - .2 Coating thickness: not less than 0.03 mm.
 - .3 Outdoor exposure period: 20 years.
- .2 Thickness specified for prefinished aluminum sheet applies to base metal.

2.3 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.



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- .2 Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.
 - .3 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
 - .4 Fasteners: of same material as sheet metal, to CSA B111.
 - .5 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
 - .6 Touch-up paint: as recommended by prefinished material manufacturer.
- 2.4 FABRICATION**
- .1 Fabricate aluminum flashings and other sheet aluminum work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction.
 - .2 Form pieces in 2400 mm maximum lengths.
 - .1 Make allowance for expansion at joints.
 - .3 Hem exposed edges on underside 12 mm.
 - .1 Mitre and seal comers with sealant.
 - .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
 - .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.
- 2.5 METAL FLASHINGS**
- .1 Form flashings to profiles indicated of prefinished aluminum.
- PART 3 - EXECUTION**
- 3.1 MANUFACTURER'S INSTRUCTIONS**
- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2 INSTALLATION**
- .1 Install sheet metal work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction and as detailed.
 - .2 Use concealed fastenings except where approved before installation.
 - .3 Provide underlay under sheet metal.
 - .1 Secure in place and lap joints 100 mm.
 - .4 Lock end joints and caulk with sealant.
- 3.3 CLEANING**
- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
 - .2 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

