

PART 1 - GENERAL

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip galvanized) Coatings on Iron and Steel Products.
 - .2 *ASTM D638-14, Standard Test Method for Tensile Properties of Plastics.***
 - .3 ASTM E1748-95(2017), Standard Test Method for Evaluating the Engagement Between Windows and Insect Screens as an Integral System.
- ~~.2 Canadian General Standards Board (CGSB)
 - ~~.1 CAN/CGSB 12.12 M90, Plastic Safety Glazing Sheets.~~~~
- .2 CSA Group
 - .1 AAMA/WDMA/CSA 101/I.S.2/A440:19, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .2 CSA A440S1-17, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .3 CAN/CSA-A440.4:19, Window, Door, and Skylight Installation
 - .4 CAN/CSA-A440.2:19/A440.3:19, Fenestration energy performance/User guide to CSA A440.2:19, Fenestration energy performance.
 - .5 CSA Z91-17, Health and Safety Code for Suspended Equipment Operations.
- .3 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - 2020.
 - .1 MPI #79, Primer, Alkyd, Anti-Corrosive for Metal.

1.2 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, interior and exterior trim, elevations of unit, anchorage details, location of isolation coating, 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 Samples will be returned for inclusion into work.
 - .3 Submit one representative model of each type window.

- .4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.
- .5 Include 150 mm long samples of head, jamb, and sill to indicate profile.
- .5 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.
 - .2 All test reports that reference the NAFS must include, on the first page, a summary of the results including, at minimum:
 - .1 The product manufacturer.
 - .2 The type of product.
 - .3 The model number/series number.
 - .4 The primary product designation.
 - .5 The secondary product designation.
 - .1 Positive design pressure.
 - .2 Negative design pressure.
 - .3 Water penetration resistance test pressure.
 - .4 Canadian air infiltration and exfiltration levels.
 - .6 The test completion date.
 - .3 The report will also contain the following information:
 - .1 Test dates.
 - .2 Report preparation dates.
 - .3 Test information retention period.
 - .4 Location of testing facilities.
 - .5 Full description of test samples, including:
 - .1 Vinyl finish.
 - .2 Condensation resistance.
 - .3 Safety drop - vertical sliding windows only.
 - .5 Sash strength and stiffness - operable casement.
 - .6 Sash pull-off - vinyl windows.
 - .7 Forced entry resistance.
 - .8 Mullion deflection - combination and composite windows.
 - .6 Complete description of amendments, as applicable.
 - .7 Conclusion.
 - .8 Drawings signed by the testing laboratory, if provided.

1.3 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.

1.4 QUALITY ASSURANCE

- .1 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 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 in dry location 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.
- .4 Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, padding, and packaging materials as specified in Waste Reduction Workplan in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Materials: to AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:
- .2 Sash: steel.
- .3 Main frame: thermally broken steel.
- .4 Plastic glazing: to ~~CAN/CCSB-12.12~~ **ASTM D638**, clear, 16 mm thick.
 - .1 Material: **triple-wall** polycarbonate.
 - ~~.2 Category: 1.~~
 - .2 Light Transmission: minimum ~~80%~~ **76%**.
- .5 Sealants: In accordance with Section 07 92 00.

2.2 WINDOW TYPE AND CLASSIFICATION

- .1 Product types:
 - .1 FW- Fixed window.
- .2 Classification rating: to AAMA/WDMA/CSA 101/I.S.2/A440 and CSA A440S1.
 - .1 Primary designation:
 - .1 Performance classes: CW.
 - .2 Performance categories: 30.
 - .2 Secondary designation:
 - .1 Positive design pressure: 1440 Pa.
 - .2 Negative design pressure: -1440 Pa.
 - .3 Water penetration resistance test pressure: 220 Pa.
 - .4 Canadian air infiltration and exfiltration levels: A2.
 - .3 Surface condensation control: compliant with standard CAN/CSA-A440.2/A440.3.
 - .4 Forced Entry: F2.
 - .5 Ancillary properties (Energy rating).

- .1 Overall coefficient of heat transfer (U-factor) 0.29 W/(m².K).
- .2 Solar heat gain coefficient (SHGC) 0.40.
- .3 Visible transmittance (VT) 1.10.

2.3 FABRICATION

- .1 Fabricate in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 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 Face dimensions detailed are maximum permissible sizes.
 - .4 Brace frames to maintain squareness and rigidity during shipment and installation.
 - .5 Finish steel clips and reinforcement with shop coat primer to MPI #79, 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, including appendices, supplemented as follows:
 - .1 Colour to match Departmental Representative's sample.

2.5 GLAZING

- .1 Glaze windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

2.6 AIR BARRIER AND VAPOUR RETARDER

- .1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:
 - .1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

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.
 - .2 Arrange components to prevent abrupt variation in colour.
- .2 Sill installation:
 - .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.
 - .2 Cut sills to fit window opening.
 - .3 Secure sills in place with anchoring devices located at ends and joints of continuous sills and evenly spaced 600 mm on centre in between.
 - .4 Fasten drip deflectors with self tapping stainless steel screws.
 - .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.
- .3 Caulking:
 - .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
 - .2 Apply sealant in accordance with Section 07 92 00. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00.
 - .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 00.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

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