

**Part 1 General**

**1.1 RELATED WORK**

- .1 Section 079210 Joint Sealing - System perimeter sealant and back-up materials.

**1.2 REFERENCES**

- .1 Aluminum Association (AA)
  - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-79.1-M91, Insect Screens.
- .3 CSA International
  - .1 CSA-A440-00/A440.1-00(R2005), A440-00, Windows/Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for window components, anchorage and fasteners; glass and infill; and internal drainage details. Include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.
- .2 Shop Drawings:
  - .1 Indicate system dimensions, framed opening requirements and tolerances; adjacent construction; anchor details; anticipated deflection under load; affected related Work; weep drainage network; expansion and contraction joint location and details; and field welding required.
    - .1 Submit listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.
- .3 Test and Evaluation Reports:
  - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
    - .1 Windows.
    - .2 Anodized finish.

- .3 Air tightness.
- .4 Water tightness.
- .5 Wind load resistance.
- .6 Condensation resistance.
- .7 Forced entry resistance.
- .8 Mullion deflection - combination and composite windows.
- .2 Field Testing
  - .1 The contractor shall carry out field tests for air tightness, after installation, on three vertical slider windows and three hopper windows selected by the architect. The tests are to show compliance with the CAN/CSA A440 rating of A3 for air tightness.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.

#### **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 Handle work of this Section in accordance with CAN/CSA-A440.
  - .2 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .3 Store and protect aluminum window components from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.

#### **1.6 WARRANTY**

- .1 Provide a written warranty, signed and issued in the name of the owner, stating that the total aluminum window and framing systems are warranted against leakage, defects and malfunction under normal usage for a period of five (5) years from date of Certificate of Substantial Performance. Total system includes installation and related caulking. Defective materials and workmanship include, but are not limited to, abnormal deterioration; aging and weathering of work; leakage of water and air exceeding specified limits; structural failure of components resulting from forces and movements up to the specified limits; condensation; deteriorating, peeling and discolouration of materials in excess of normal use.
- .2 Provide a separate written warranty stating that factory sealed double glazed insulating units are warranted against leakage, malfunction and other defects, under normal usage

for a period five (5) years from date of Certificate of Substantial Performance. Without restricting the generality of the warranty, defects to the insulating glazing units shall include warping of spacer bars by greater than 3mm; dust or film formation on internal glass surfaces; glass breakage except that caused by thermal shock and impact of solid objects; deteriorating of glass coatings, including thermal properties.

## **Part 2      Products**

### **2.1          MATERIALS**

- .1 Materials: to CSA-A440 supplemented as follows:
- .2 All windows by same manufacturer.
- .3 Sash: aluminum.
- .4 Main frame: aluminum, thermally broken, with factory installed XPS insulation to fill frame depth.
- .5 Glass: Fixed lites
  - .1 Vision Glass: double glazed insulated units to CAN/CGSB-12.8; 2 panes of 6mm glass, 25mm overall thickness Exterior lites at ground level where shown on drawings shall be tempered.
    - .1 Clear float outer lite
    - .2 Clear float inner lite
    - .3 13mm high performance thermal spacer, Superspacer or equivalent
    - .4 Inert gas filled: Argon
    - .5 Visible light transmittance: 70% average daylight
    - .6 Solar heat gain coefficient: 0.38.
    - .7 Shading coefficient: 0.43.
    - .8 U Value: winter 0.28, summer 0.29
    - .9 Acceptable Product
      - .1 PPG Solarban 60
      - .2 Cardinal 272
      - .3 Approved Alternative
- .6 Exterior break formed aluminum sills of type and size as detailed to suit job conditions; 2 mm thick, complete with joint covers and anchoring devices.
- .7 Isolation coating: alkali resistant bituminous paint.
- .8 Insulated panels of 1.5mm aluminum sheet bonded to outer face of rigid urethane insulation with 22ga. galvanized steel bonded to inner face; 25mm overall thickness. Colour to be selected.
- .9 Curtain wall caps:
  - .1 Extruded aluminum snap-on trim secured to continuous pressure plate with concealed fastening method.
  - .2 ¾" deep x 2" wide, clear anodized finish.
- .10 Foamed in Place Insulation:

- .1 Low expansion, one component foam polyurethane, solvent free to CAN/ULC-S705.1
- .2 Acceptable Material
  - .1 Enerfoam, by Dow Chemical
  - .2 Handi-foam, by Fomo Products
  - .3 CF 128-DW, by Hilti
- .3 Application
  - .1 Apply insulation to clean surfaces in accordance with the manufacturer's printed instructions. Use primer when recommended by the manufacturer.
  - .2 Apply foam-in-place insulation into spaces between window frames and the adjacent building components to form a continuous air barrier, to completely fill voids and to insulate interior of frames. Refer to drawings for details.

## **2.2 WINDOW TYPE AND CLASSIFICATION**

- .1 Types:
  - .1 Fixed:
    - .1 Acceptable material:
      - .1 Alumicor Trueline 900 (4 ¼" deep)
      - .2 Kawneer 516
      - .3 Commdoor 425
- .2 Classification rating: to CSA-A440/A440.1.
  - .1 Air tightness: A3.
  - .2 Water tightness: B7.
  - .3 Wind load resistance: C5.
  - .4 Condensation resistance: Temperature Index, I 56.
  - .5 Forced Entry: F2.
  - .6 Glazing: G1.

## **2.3 FABRICATION**

- .1 Fabricate in accordance with CSA-A440/A440.1 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 CAN/CGSB-1.40 380 g/m<sup>2</sup> zinc coating to ASTM A123/A123M.

## **2.4 ALUMINUM FINISHES**

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes - 2000.
  - .1 Clear anodic finish: designation AA-.0004-A-31 for interior and exterior aluminum.

## **2.5 ISOLATION COATING**

- .1 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.

## **2.6 GLAZING**

- .1 Glaze windows in accordance with CSA-A440/A440.1.

## **2.7 HARDWARE**

- .1 Hardware: stainless steel sash locks and aluminum handles to provide security and permit easy operation of units.
- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.
- .3 Where windows latching devices are located in excess of 6'-3" mm above floor level:
  - .1 Equip projecting units with hardware or design sash to permit pole opening.

## **2.8 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 Sheet Seal: Combination air/vapour barrier self-adhesive bitumen laminated to high-density polyethylene film, nominal thickness 40mil (1mm).
    - .1 Acceptable material:
      - .1 W.R. Grace - Perm-A-Barrier
      - .2 Bakor - Blueskin SA
      - .3 IKO - Aquabarrier AVB
      - .4 Soprema - Sopraseal Stick 1100
  - .2 Primer: recommended by membrane manufacturer appropriate to the application.
  - .3 Substrate Cleaner: non-corrosive type recommend by membrane manufacturer compatible with adjacent materials.
  - .4 Execution

- .1 Comply with manufacturers written recommendations or specifications for materials and installation
- .2 Perform work in accordance with National Air Barrier Association - Professional Contract Quality Assurances Program and requirements for materials and installation.
- .3 Verify that surfaces are clean, dry, sound, smooth, and continuous and comply with air barrier manufactures requirements.
- .4 Remove loose or foreign matter which might impair adhesion of materials.
- .5 Ensure substrate is clean of oil or excess dust, free of large voids, sharp protrusions, and free of surface moisture prior to application of self-adhesive primer.
- .6 Protect finished work.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed are acceptable for product installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Architect 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 Architect.

#### **3.2 INSTALLATION**

- .1 Window installation:
  - .1 Install in accordance with CSA-A440/A440.1.
  - .2 Arrange components to prevent abrupt variation in colour.
  - .3 Verify all rough opening sizes before ordering units.
- .2 Sill installation:
  - .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use maximum lengths at each location.
  - .2 Cut sills to fit window opening or as indicated on drawings.
  - .3 Secure sills in place with anchoring devices located at ends and evenly spaced at 24" on center in between, maximum.
  - .4 Fasten expansion joint cover plates and drip deflectors with self-tapping stainless steel screws.
  - .5 Maintain ¼" to 5/16" space between butt ends of continuous sills. For sills over 48" in length, maintain 1/8" to ¼" 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 - Joint Sealants. Conceal sealant within window units.
- .3 Cavities between window frames and rough openings to be filled with Foamed-In non-expanding insulation.

**3.3 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 window installation.

**END OF SECTION**