

SECTION 08 53 00

TUBULAR PLASTIC WINDOWS

1 PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Factory fabricated tubular extruded plastic windows with fixed and operating sash.
- B. Glass factory glazed, and framed insect screens.

1.2 APPLICABLE PUBLICATIONS

- A. Federal Specifications (Fed. Spec.):
 - 1. L-S-125B Screening, Non-metallic, Insect
 - 2. DD-G-45-1D Glass, Float or Plate, Sheet
- B. American Architectural Manufacturers Association (AAMA);
 - 1. AAMA 101 I.S.2-05 Voluntary Specification for Aluminum, PVC, and Wood Windows and Glass Doors
 - 2. Test method for rate of Air Leakage through Exterior windows, Curtain walls and doors (ASTM E283)
 - 3. Test method for Structural Performance of Exterior Windows, Curtain walls and doors (ASTM E330)
 - 4. Test method for Water Penetration of Exterior windows, Curtain walls and doors by Uniform Static Air Pressure Difference (ASTM E547)
 - 5. Specifications for Sealed Insulating Glass Units (ASTM E774) AAMA 1503-98 Voluntary test method for Condensation Resistance of Windows, Doors, and Glazed wall sections
 - 6. AAMA 615-02 Voluntary Specification, Performance Requirements, and Test Procedures for Superior Performing Organic Coatings on Plastic Profiles
 - 7. NFRC 100-97 Procedure for Determining Fenestration Product U-factors
 - 8. NFRC 200-97 Procedure for Determining Fenestration Product Solar Heat Gain Coefficients
 - 9. NFRC 400-01 Procedure for Determining Fenestration Product Air Leakage
- C. AAMA Certification Program for Vinyl Window Manufacturers

1.3 SYSTEM DESCRIPTION

- A. Windows: Extruded tubular plastic sections, factory fabricated, insulated vision glass, related flashings, anchorage and attachment devices.

- B. Performance Requirements for Windows: Conform to ASTM D-4099 Grade H-R40 (Single Hung), Grade AP-R60 (Awning).
- C. NFRC rated.
- D. System Design: Performance to provide for expansion and contraction within system components caused by temperature cycling. Design and size members to withstand dead loads caused by pressure and suction of wind.
- E. Air Infiltration: Limit air leakage through assembly to 0.15 cfm/min/sq ft (single hung) of sash area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with AAMA 501.
- F. Heat Loss: Limit Rate of Heat Loss to a maximum U-value to 0.35.
- G. Heat Gain: Limit Solar Heat Gain Coefficient to a maximum of 0.35.
- H. Water Leakage: None, when measured in accordance with AAMA/NWWDA 101/I.S.2-97 at 10.5 psf (single hung), 10.5 psf (awning).
- I. Uniform Structural Load: No damage at 60 psf (single hung), 90 psf (awning), when measured in accordance with AAMA/NWWDA 101/I.S.2-97.
- J. Condensation Resistance Factor: 65 when tested in accordance with AAMA 1502.7.
- K. System Internal Drainage: Drain water entering the framing system, to exterior.
- L. Thermal Movement: Design sections to permit thermal expansion and contraction of plastic as compared to glass, infill, or perimeter opening construction.

1.4 SUBMITTALS

- A. Product Data: Provide component dimensions, anchorage and fasteners, glass, internal drainage details and screens.
- B. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work and installation requirements.
- C. Certified Test Reports: Submit for air infiltration, water resistance, and uniform loading in accordance with the above referenced specification.
- D. Certification of Compliance: Submit certificates that equivalent windows have been successfully tested and meet the requirements specified herein for air infiltration and water penetration.

1.5 WARRANTY

- A. Windows shall be fully warranted against any defects in material or workmanship under normal use and service for a period of 20 years from date of acceptance on commercial projects and lifetime warranty to original homeowner on residential projects. 5 years factory labor included.

- B. Insulated Glass Units shall be fully warranted against visual obstruction resulting from film formation or moisture collection between the interior glass surface, excluding breakage, for a period of 20 years from date of acceptance on commercial projects and lifetime warranty to original homeowner on residential projects. 5 years factory labor included.
- C. Contractor shall provide a written service warranty that clearly spells out how requests for service shall be handled, by whom, under whose responsibility and shall include the time frame for handling these service requests. A labor warranty providing service on the windows shall cover a period of not less than 10 years, and shall be provided in writing. A copy of the product and labor warranty must accompany other applicable warranties and be presented with bid.

2 PART 2 PRODUCTS

2.1 WINDOW UNITS

- A. Window Unit Manufacturers:
 - 1. Paradigm Window Solutions, Portland, Maine, or approved equal.
- B. Frames: 3-1/4" deep profile.
- C. Configuration: Single hung tilt-wash sash.
 - 1. Model: Paradigm Window Solutions "Hybrid Single Hung", or Equal
- D. Configuration: Awning sash.
 - 1. Model: Paradigm Window Solutions "Awning", or Equal

2.2 FRAME MATERIALS AND ACCESSORIES

- A. Extruded PVC components produced from commercial quality virgin PVC (unplasticised polyvinyl chloride), conforms to AAMA 303 from sections in one piece, straight, true and smooth. Provide multi-chambered PVC extruded frames and sash in accordance with the manufacturers standard practice. Make fusion welded frame joints strong enough to develop full strength of members, with an external wall thickness of .070 ". Make interior horizontal top surfaces of both meeting rails flat and in the same plane. Meeting rails have an integral interlock with two lines of pile weatherstrip provided. Upper and lower sash shall have the same glass size. Sash shall have fusion welded mitered corners with an external wall thickness of .070". Snap in sill insert sloped to provide positive weep system with appropriate slots and slope to provide drainage to the exterior.
- B. Fasteners: Stainless steel.
- C. Sills: Extruded tubular plastic; sloped for positive wash; extend 1 inch beyond wall face; one piece full width of opening.
- D. Insect Screen Frames: Extruded aluminum, of rectangular sections.

- E. Screening: FS L-S-125, Type II, Class 2, 18 x 16 fiberglass mesh set into frame and secured. Fit frames with adjustable roller hardware.
- F. Weather Stripping, Hung Sash: Minimum of two courses of solid barrier fin-type at crack perimeter with flexible bulb type at bottom sash, configured for flexible fit.
- G. Weather Stripping, Awning Sash: Minimum of three points of weatherstripping on all four sides of sash: EPDM covered open cell foam weatherstrip on the sash, Santoprene or equal TPR compression gasket on the frame and a co-extruded flexible PVC fin on the frame.
- H. Sealant and Backing Materials: As specified in Section 07 90 00.
- I. Anchor Devices: Stainless steel.
- J. Grilles: Simulated divided lite on exterior as indicated, white color. Provide simulated double-hung grilles at casement windows.

2.3 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing: Glass shall conform to DD-G-451 and not less than "B" quality. Factory glazed $\frac{3}{4}$ " Low-E insulating glass conforming to ASTM-E-774, with TruSeal Duralite IG spacer, manufactured by TruSeal Industries Inc., Cleveland, OH. Glazing shall be integral glazing type system with architectural back bedded glazing tape and designed to maintain a watertight seal between glass and sash frame. Non-standard glass options may have metal box-type spacer with dual seal system.

2.4 HARDWARE

- A. Single Hung Sash:
 - 1. Balance Mechanism & Operation – lower sash: Provide two 1/2" stainless steel, constant force coil spring balances. Enclose balance springs in rustproof cases, from the top of the bottom sash to the head of the window unit. Balances shall also have an interlocking pivot bar, and provide positive locking of sash location when sash is tilted in for cleaning.
 - 2. Balance Mechanism & Operation – upper sash: Provide two inverted block & tackle spring balances. Balances shall also have an interlocking pivot bar, for integral frame alignment with sash for keeping window frames straight and true during installation. Upper sash to be further secured using removable jamb stop inserts below with integral screen track. Removal of insect screen and stops will allow the top sash to be lowered and tilted in for cleaning. Balance to provide positive locking of sash location when sash is tilted in for cleaning.
 - 3. Locking Device: Provide each window over 32 inches in width with two cam-action sweep sash locks, and windows under 30" in width with one lock. The lower sash shall have one continuous, integral lift rail at the bottom of the sash. Provide two tilt latches in the top of each sash for tilting in sash for cleaning. The tilt latches shall be integrally mortised into the sash top rails for a clean appearance.
 - 4. Hung Sash Tilt Latches: Integrally mortised into sash top rails, both sash.

- B. Awning Sash:
 - 1. Operating Hardware: Truth Hardware "EntryGard" Maxim.
 - 2. Sash lock: Truth Hardware "EntryGard" Maxim multipoint locking system.
- C. Fasteners: Stainless steel.

2.5 FABRICATION

- A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
- B. Weathering Surfaces: All frame members shall be multi-chambered PVC extrusions utilizing double wall design without the need for reinforcement. Frame corners shall be fusion welded. Sash members shall be multi-chambered PVC extrusions utilizing double wall design at all glazing locations. Horizontal sash members shall be mitered and fusion welded to vertical sash members.
- C. Drips and Weep Holes: Provided as required to return water to the outside.
- D. Glazing Thickness: Design glazed windows and rabbets suitable for glass thickness specified above.
- E. Fasteners: All fasteners are to be stainless steel type, corrosion resistant. Use flathead, cross-recessed type, exposed head screws with standard threads on windows, trim, and accessories. Screw heads shall finish flush with adjoining surfaces. Self-tapping sheet metal screws are not acceptable for material more than 1/16 inch in thickness. All sheetmetal screw fasteners shall penetrate into a screw boss consisting of at least three layers of PVC profile for secure fastening and reduce pull out.
- F. Provisions for Glazing: Design sash for outside double-glazing and for securing glass with manufacturer's standard glazing systems. Provide glazing channels of adequate size and depth to receive and properly support the glass and glazing accessories.
- G. Factory Mulls: Factory mulls to be fully reinforced with extruded aluminum I-beam reinforcement of 6005-T5 alloy and assembled utilizing interior and exterior "U" channels and proprietary sealant application patterns. Reinforcement to be further attached to window frames with .080" x 1.375" x 12" stainless steel straps and appropriate stainless steel fasteners.
- H. Accessories: Provide windows complete with necessary hardware, fastenings, clips, fins, anchors, glazing beads, and other appurtenances necessary for complete installation and proper operation.
- I. Sill Nose: Co-extruded flex-fin' durometer weatherstrip to provide a seal between the casing and the window frame without the use of surface applied caulking. The extrusion shall consist of multiple chambers with a 1 3/4" extruded nailing fin and 1" by 3/4" integral J channel. Exterior wall thickness shall be a minimum of 0.075 ". A color-matched end cap shall be installed at both ends. Optional exterior color finish may be applied to match or complement the exterior color of the window.

- J. Form snap in glass stops, closure molds, weather stops, and flashings of extruded PVC for tight fit into window frame section. Form weather stop flange to perimeter of unit.
- K. Weatherstripping: Provide for ventilating sections of all windows to insure a weathertight seal meeting the infiltration tests specified herein. Use easily replaceable factory applied weather-stripping of manufacturer's stock type, as specified above. Use EPDM covered open cell foam weatherstrip for compression contact between the sill and the sash. For sliding surfaces, use silicone treated pile, with a Mylar center fin bonded to a plastic-backing strip.
- L. Screens: Provide one insect screen for each operable ventilating unit. Design screens to fit closely around entire perimeter of each ventilator or opening, to be rewirable, easily removable from inside building, and interchangeable for same size ventilators of similar type windows, with no exposed fasteners and latches. Provide all guides, stops, clips, bolts and screws as necessary, for a secure and insect tight attachment to window. Provide continuous extruded aluminum screen frame for screen strength.
 - 1. Screen Frames: Provide same quality and color finish as the window units. Frames shall have extruded sections not less than .375" by 1" by 0.030" thick and shall have removable vinyl splines. Hardware, attachment devices, and accessories shall be manufacturer's standard and of same quality, material and finish as hardware of window unit.
 - 2. Screening: Install screening with weave parallel to frame and stretch sufficiently to present a smooth appearance. Conceal edges of screening in the spline channel.
 - 3. Screen Finish: Exposed surfaces of aluminum extrusions shall be thoroughly cleaned, primed and given a finish in accordance with AAMA 603.8 with total dry thickness not less than 0.8mil. The finish color shall match the vinyl window.

2.6 FINISHES

- A. Exterior Surfaces: White color.
- B. Interior Surfaces: White color.
- C. Screens: Black color.

3 PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify that rough openings are correctly sized and located. Provide rough openings to Design-Builder before wall openings are framed.
- B. Prepare opening to permit correct installation of frame and achieve continuity of air and vapor barrier seal.

3.2 INSTALLATION

- A. Method of Installation: Install in strict accordance with the window manufacturer's printed instructions and details, except as specified otherwise herein. Install windows without forcing into prepared window openings. Shim windows as required to center in rough openings. Insulate perimeter of window frame with acceptable approved insulation material, as recommended by window manufacturer. Set windows at proper elevation, location, and reveal; plumb, square, level, and in alignment; and brace, strut, and stay properly to prevent distortion and misalignment. Protect ventilators and operating parts against accumulation of dirt, and building materials by keeping ventilators tightly closed and locked to frame. Bed screws in joints at mullions, contacts of windows with sills, built in fins, and sub-frames in approved sealant. Install windows in a manner that will prevent entrance of water.
- B. Anchors and Fasteners: Make ample provision for securing units to each other, and to adjoining construction.
- C. Adjustments after Installation: After installation of windows adjust all ventilators and hardware to operate smoothly and to provide weathertight sealing when ventilators are closed and locked. Lubricate hardware and operating parts as necessary.
- D. Coordinate attachment and seal of air and water infiltration membrane, flexible flashing and vapor barrier materials. Fill shim spaces at perimeter of assembly with non-expansive foam sealant to maintain continuity of thermal barrier.
- E. Install perimeter sealant, backing materials, and installation requirements in accordance with Section 07 90 00.

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