SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 DESCRIPTION

A. New 4-Track Double Hung Aluminum windows of type and size shown, complete with hardware, integral blinds, related components and accessories.

1.2 DEFINITIONS

A. Accessories: Trim, moldings, panning systems, sub-sills, clips anchors, fasteners, weather-stripping, integral blinds and other necessary components required for fabrication and installation of window units.

B. Uncontrolled Water: Water not drained to the exterior, or water appearing on the room side of the window.

1.3 RELATED WORK

A. Glazing: Section 08 80 00, GLAZING.

1.4 DELIVERY, STORAGE AND HANDLING

A. Protect windows from damage during handling and construction operations before, during and after installation.

B. Store windows under cover, setting upright.

C. Do not stack windows flat.

D. Do not lay building materials or equipment on windows.

1.5 QUALITY ASSURANCE

A. Approval by contracting officer is required of products or service of proposed manufacturers and installers.

B. Approval will be based on submission of certification by Contractor that:

1. Manufacturer regularly and presently manufactures the specified windows as one of its principal products.
2. Installer has technical qualifications, experience, trained personnel and facilities to install specified items.

C. Provide each type of window produced from one source of manufacturer.

D. Quality Certified Labels or certificate:

1. Architectural Aluminum Manufacturers Association, "AAMA label" affixed to each window indicating compliance with specification.
2. Certificates in lieu of label with copy of recent test report (not more than 4 years old) from an independent testing laboratory and certificate signed by window manufacturer stating that windows provided comply with specified requirements and AAMA 101/I.S.2 for type of window specified.

1.6 SUBMITTAL

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Minimum of 1/4 full scale types of windows on project.
2. Identifying parts of window units by name and kind of metal or material, show construction, locking systems, mechanical operators, trim, installation and anchorages.
3. Include glazing details and standards for factory glazed units.

C. Manufacturer's Literature and Data:

1. Window.
2. Locks to match sash locks on existing St. Cloud Windows, Inc. windows.

D. Certificates:

1. Certificates as specified in paragraph QUALITY ASSURANCE.
2. Indicating manufacturers and installers qualifications.
3. Manufacturer's Certification that windows delivered to project are identical to windows tested.

E. Test Reports:

1. Copies of test reports as specified in paragraph QUALITY ASSURANCE.

F. Samples: Provide 150 mm (six-inch) length samples showing finishes, specified.

1.7 WARRANTY

A. Warrant windows against malfunctions due to defects in thermal breaks, hardware, materials and workmanship, subject to the terms of Article “WARRANTY OF CONSTRUCTION”, FAR clause 52.246-21, except provide 10 year warranty period.

1.8 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

90.1-07 ..... Energy Standard of Buildings

C. American Architectural Manufacturers Association (AAMA):

101/I.S.2/A440-08 ..... Windows, Doors, and Unit Skylights

505-09 ..... Dry Shrinkage and Composite Performance Thermal Cycling Test Procedures

2605-05 ..... Superior Performing Organic Coatings on Architectural Aluminum Extrusions and Panels

TIR-A8-08 ..... Structural Performance of Poured and Debridged Framing Systems

D. American Society for Testing and Materials (ASTM):

A653/A653M-09 ..... Steel Sheet, Zinc Coated (Galvanized), Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-dip Process

E 90-09..... Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

E. National Fenestration Rating Council (NFRC):

NFRC 100-10 ..... Determining Fenestration Product U-Factors

NFRC 200-10 ..... Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

F. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500-06 ..... Metal Finishes Manual

PART 2- PRODUCTS

2.1 MATERIALS

A. Aluminum Extrusions; Sheet and Plate: AAMA 101/I.S.2.

B. Sheet Steel, Galvanized: ASTM A653; G90 galvanized coating.

C. Weather-strips: AAMA 101/I.S.2; except leaf type weather-stripping is not permitted.

D. Insect Screening: Not required.

E. Fasteners: AAMA 101/I.S.2. Screws, bolts, nuts, rivets and other fastening devices to be non-magnetic stainless steel.

1. Fasteners to be concealed when window is closed. Where wall thickness is less than 3 mm (0.125 inch) thick, provide backup plates or similar reinforcements for fasteners.
2. Stainless steel self tapping screws may be used to secure Venetian blind hanger clips, vent guide blocks, friction adjuster, and limit opening device.
3. Attach locking and hold-open devices to windows with concealed fasteners. Provide reinforcing plates where wall thickness is less than 3 mm (0.125 inch) thick.

F. Weather-strips: AAMA 101/I.S.2.

G. Hardware:

1. Locking Device: Interior sashes shall have standard sash locks and (keyed) matching existing St. Cloud Windows installed at the Fargo VA Medical Center. Fabricate strikes from Type 304 Stainless Steel or White Bronze.
   a. All windows shall be equipped with an additional keyed sash lock that locks both inner sashes together. The lock shall be a plunger style. Provide two keys per window; all windows shall be keyed alike to match existing windows at the Fargo VAMC.
2. Counterbalance: All sashes must be double balanced. Balances must provide a positive lifting force through the full range of travel and hold the sash stationary at any open position without the use of auxiliary friction devices. Balance components shall be manufacturers standard, composed of zinc die cast metal with nylon rollers assuring smooth operation.

3. Interior and exterior sashes shall be provided with spring-loaded plunger locks and strip plates, lock to engage when window sash is in the closed position.

H. Integral Venetian Blinds:
1. Tempered aluminum slats with manufacturer's standard baked-on acrylic enamel finish.
2. Slats maximum 5/8" wide.
3. Slat Color: Match existing contained within similar windows at the Fargo VA.
4. Weave cords and tapes of polyester-dacron fiber.
5. Control raising and lowering of blinds by cords or other arrangement, accessible only when the inner sash is opened.
6. Angle of slat tilt adjustable by means of a non-removable control knob.

2.2 THERMAL AND CONDENSATION PERFORMANCE

A. ANSI/AAMA 101.
B. Condensation Resistance Factor (CRF): Minimum CRF of C 62.
C. Thermal Transmittance: When tested in accordance with AAMA 1503.1-88 on a window 4 ft. x 6 ft., the thermal transmittance due to conduction (Uc) must not exceed .56.

2.3 AIR INFILTRATION:

A. With primary sash in a closed and locked position, and the secondary (exterior) sash in the full open position, window must be tested in accordance with ASTM-E283 and meet the following performance requirements.
1. Air infiltration on windows with less than 18 feet of operable sash crack perimeter, shall not exceed 2.8 cfm per square foot of window area when tested in a static pressure drop of 1.57 psf (equivalent to 25 mph wind velocity), or 6.3 cfm total when tested at 6.24 psf (equivalent to 50 mps wind velocity).
2. Air infiltration on windows with 18 or more feet of operable sash crack perimeter shall not exceed .05 cfm per square foot of window area at a static pressure drop of 1.57 psf or .15 cfm at 6.24 psf.

2.4 WATER RESISTANCE:

A. With primary set of sash in the closed and locked position, and the secondary (exterior) sash in the full open position, the window shall be subjected to a pressure drop of 8.00 psf. After passing first test, window may also be tested with both sets of sash closed and latched and shall be subjected to a minimum pressure drop of 12.00 psf. Tests shall be conducted in accordance with ASTM-547-93.

2.5 UNIFORM LOAD STRUCTURAL TEST:

A. With the primary sash in a closed position, and the secondary (exterior) sash in the full open position, test in accordance with ASTM-E-330. At a static air pressure difference of 60.0 pounds per square foot with pressure applied both positively and negatively.

B. Static air pressure difference shall be 1.5 times the design pressure used in H-DW-HC40, AAMA 101/I.S. 2-97 (1.5 is the factor used to provide a margin of safety in aluminum windows and is the minimum recommended by the AAMA).

C. At conclusion of test, there shall be no glass breakage; permanent damage to fasteners, hardware parts, support arms, or actuating mechanisms. Permanent deformation of any frame, sash or ventilator member must not exceed 0.04% of its span.

2.6 FABRICATION

A. Fabrication to exceed or meet requirements of Physical Load Tests, Air Infiltration Test, and Water Resistance Test of AAMA 101/I.S.2.

B. Glazing:
   1. Factory or field glazing optional.
   2. Glaze in accordance with Section 08 80 00, GLAZING.
   3. Windows reglazable without dismantling sash framing.
   4. Design rabbet to suit glass thickness and glazing method specified.

C. Exterior Panning Trim:
   1. Trim includes casings, closures, and panning.
   2. Fabricate to shapes shown of aluminum not less than 1.6 mm (0.062 inch) thick
   3. Extruded or formed sections, straight, true, and smooth on exposed surfaces.
   4. Exposed external corners mitered and internal corners coped; fitted with hairline joints.
   5. Except for strap anchors, provide reinforcing for fastening near ends and at intervals not more than 305 mm (12 inches) between ends.
   6. Design to allow unrestricted expansion and contraction of members and window frames.
   7. Secure to window frames with machine screws or expansion rivets.
   8. Exposed screws, fasteners or pop rivets are not acceptable on exterior of the casing or trim cover system.

D. Sill Flashing:
   1. Fabricate to shapes shown of not less than 2 mm (0.080 inch) thick extruded aluminum.
   2. One piece full length of opening with concealed anchors.
   3. Sills turned up back edge not less than 6 mm (1/4 inch). Front edge provide with drip.
   4. Sill back edge behind face of window frame. Do not extend to interior surface or bridge thermal breaks.
   5. Do not perforate for anchorage, clip screws, or other requirements.

2.7 DOUBLE HUNG WINDOWS:

A. ANSI 101/AAMA 101, Double hung type, dual sash 4-track design. H-DW-HC40. Exterior sash shall be glazed with 5/8” clear insulated glass with simulated divided lite (match pattern of other similar windows at the Fargo VA) and interior sash glazed with 3/16” low “E” single glazing. Frame shall be approximately 5-7/8” depth.

B. Manufacturer's/Type:
   a. 4 Track aluminum, SCW 900 Series, dual sash window units as manufactured by St. Cloud Window Inc. to match existing.

C. Sash:
   1. Provide units with removable sash feature permitting sash removed without tools (except for security device) for cleaning from interior.
   2. All sash members shall be hollow tubular extrusions to resist twist and deflection. Inner and outer sash must have same section modulus. Sash members shall be square cut and milled to allow telescoped joints at each corner. Assembly screws must be stainless steel.
   3. Provide simulated divided lites on exterior sash consisting of extruded aluminum muntin bars attached to inside and outside of insulated glass with double stick glazing tape. Aluminum muntins shall not be over ¾" wide.

D. Factory sealants: Sill, heads, jambs and mullions must be butt sealed prior to assembly. Screw heads and seams, must be caulked; and sill corners back sealed after assembly.

E. Sill frame shall be constructed of tubular frames and weeped (including weep flaps) to prevent accumulation of water in sill. Sill frames shall be sloped.

2.8 FINISH, DOUBLE HUNG WINDOWS:

A. In accordance with NAAMM AMP 500 Series.

B. Kynar Painted Finish:
   1. Fluorocarbon Finish: AAMA 605.2, 70% Kynar 500 or Hpylar 5000 PVF high performance organic coating.
   2. Finish applied to minimum 1.2 mil thickness.
   3. Finish applied to window and associated trim.
   4. Color: Inner sash and frame: Valspar's Flouropon – Bone White
      Outer sash and frame: Valspar's Flouropon – Sierra White

C. Stainless Steel: AMP 503.
   1. Concealed: 2B or 2D.
   2. Exposed: No. 4 unless specified otherwise.

D. Hardware:
   1. Finish hardware exposed when window is in the closed position: Match window color or provide in US26d, chrome, or 32d finish.

PART 3 - EXECUTION

3.1 PROTECTION (DISSIMILAR MATERIALS): AAMA 101/I.S.2.

3.2 INSTALLATION, GENERAL

A. Install window units in accordance with manufacturer's specifications and recommendations for installation of window units, hardware, operators and other components of work.

B. Where type, size or spacing of fastenings for securing window accessories or equipment to building construction is not shown or specified, use expansion or toggle bolts or screws, as best suited to construction material.
   1. Provide bolts or screws minimum 6 mm (1/4-inch) in diameter.
   2. Sized and spaced to resist the tensile and shear loads imposed.
   3. Do not use exposed fasteners on exterior, except when unavoidable for application of hardware.
   4. Provide non-magnetic stainless steel Phillips flat-head machine screws for exposed fasteners, where required, or special tamper-proof fasteners.
   5. Locate fasteners to not disturb the thermal break construction of windows.

C. Set windows plumb, level, true, and in alignment; without warp or rack of frames or sash.

D. Anchor windows on four sides with anchor clips or fin trim.
   1. Do not allow anchor clips to bridge thermal breaks.
   2. Use separate clips for each side of thermal breaks.
   3. Make connections to allow for thermal and other movements.
   4. Do not allow building load to bear on windows.
   5. Use manufacturer's standard clips at corners and not over 600 mm (24 inches) on center.
   6. Where fin trim anchorage is shown build into adjacent construction, anchoring at corners and not over 600 mm (24 inches) on center.

E. Replacement Windows:
   1. Do not remove existing windows until new replacement is available, ready for immediate installation.
   2. Remove existing work carefully; avoid damage to existing work to remain.
   3. Perform all other operations as necessary to prepare openings for proper installation and operation of new units.
   4. Do not leave openings uncovered at end of working day, during precipitation or temperatures below 16 degrees C (60 degrees F.).

3.3 BLIND SEALANT, LOOSE INSULATION:

A. All assembled window materials shall be properly back sealed with manufacturer’s approved caulking in accordance with shop drawings or manufacturers standard installation drawings and fastened before erection.

B. Install loose fill fiberglass insulation in shim spaces around perimeter of window frame assemblies, and the cavity that exists between the new window and the existing wall construction. Insulate to maintain continuity of thermal barrier.

C. Provide blind caulking at the interior perimeter frame per requirements of Section 07 92 00 JOINT SEALANTS, during the installation process. Perimeter exposed sealant is by specified Section 07 92 00 JOINT SEALANTS.

3.4 EXTERIOR PANNING TRIM

A. Exterior Panning Trim: External corners mitered and internal corners coped, fitted with hairline, tightly closed joints.

B. Secure to concrete or solid masonry with expansion bolts, expansion rivets, split shank drive bolts, or powder actuated drive pins.

C. Toggle bolt to hollow masonry units. Screwed to wood or metal.

D. Fasten except for strap anchors, near ends and corners and at intervals not more than 300 mm (12 inches) between.

E. Seal units following installation to provide weathertight system.

3.5 ADJUST AND CLEAN

A. Adjust ventilating sash and hardware to provide tight fit at contact points, and at weather-stripping for smooth operation and weathertight closure.

B. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes.

C. Remove excess glazing and sealant compounds, dirt, and other substances.

D. Lubricate hardware and moving parts.

E. Clean glass promptly after installation of windows. Remove glazing and sealant compound, dirt and other substances.

F. Except when a window is being adjusted or tested, keep locked in the closed position during the progress of work on the project.

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