

SECTION 08 51 13
ALUMINUM WINDOWS

REVISED VIA A00010 SEE INFO IN **BOLD AND UNDERLINED** FOR CHANGES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Replacement of aluminum windows of type and size shown, complete with hardware, related components and accessories.

B. Types:

1. Fixed with Openable top
2. Fixed with Louvers
3. Fixed

NOTE: Furnish all necessary materials, labor and equipment for the complete installation of blast resistant .3 U factor energy efficient blast resistant aluminum windows complying with Force Protection Code UFC4-010-01 applicable of 84ft standoff distance use .030 laminated blast glass.

1.2 DEFINITIONS

A. Accessories: Mullions, staff beads, casings, closures, trim, moldings, panning systems, sub-sills, clips anchors, fasteners, weather- stripping, 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 QUALITY ASSURANCE

A. Approval by COTR 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 to certify he has technical qualifications, experience, trained personnel and facilities to install specified items. As per manufacturer's installation procedures.

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

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. . Shop Drawings:

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

C. Manufacturer's Literature and Data:

Window, Frame.

Sash locks, keepers, and key.

D. Certificates:

1. Blast Resistant Certification of .030 lami. Drawing SP-1 at .060 is typed incorrectly.

F. Test Reports:

1. Copies of U Value test reports.
2. Copies of Solar capabilities
3. Thermal Movement: Provide assembly capable of withstanding thermal movements resulting from ambient range of 150 deg. F (67 deg. C). Window wall temperature may be assumed to reach ambient temperature of 180 deg. F (82 deg. C).
4. Air infiltration: Maximum rate of 9.64 cu. in./min. per sq. in. (0.0017 cu. m/min per sq. m) of window area plus 52 cu. in./linear ft. (0.0028 cu./m per linear m) of operable sash joint for inward test pressure of 6.24 psf (298.8 Pa) per ASTM E 283.
5. Water penetration: No leakage for inward test pressure of 8 pounds (3.63 kg) force, per ASTM E 331.

F. Samples:

Provide Window Corner showing thermal break characteristics, showing painted finish UC115244 Duranar Sandstone color.

1.7 WARRANTY

Warrant windows against malfunctions due to defects in window frames, glass, hardware, materials and workmanship, provide 10 year warranty period.

1.8 APPLICABLE PUBLICATIONS

A. American Architectural Manufacturers Association (AAMA):

101/I.S.2/A440-05.....Windows, Doors, and Unit Skylights

505-98.....Dry Shrinkage and Composite Performance Thermal
Cycling Test Procedures

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

TIR-A8-04.....Structural Performance of Poured and Debridged
Framing Systems

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

E 90-04.....Test Method for Laboratory Measurement of
Airborne Sound Transmission Loss of Building
Partitions

D. National Fenestration Rating Council (NFRC):

NFRC 100-04.....Determining Fenestration Product U-Factors

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

AMP 500 Series.....Metal Finishes Manual

PART 2- PRODUCTS

2.1 MATERIALS

A. Aluminum Extrusions; Sheet and Plate: Provide members complying with ASTM B 221, alloy 6063-T5, -T6, or -T52, or alloy 6061-T6, for principal framing members, with 3/16 inch (4.76 mm) minimum thickness of walls; provide alloy 6063-T5, -T6, or -T52 for trim and stops which are not exposed to forced entry attack, of 1/16 inch (1.575 mm) minimum thickness.

B. Manufacturer: ~~Boyd, EFCO, Manko, Old Castle Building Envelop, Peerless Product Inc., Thermal, Wausau, Wojan or approved equal.~~

1. Any manufacturer will be acceptable, provided they comply with all requirements of the Contract Documents and receive prior approval by the COTR.
2. Finish: Painted or Powder Coat Finish UC115244 Duranar Sandstone color.

1.7 WARRANTY

C. Blast Resistant Fasteners Anchorage: 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.

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

E. Hardware:

1. Locks: Two position locking bolts or cam type tamperproof custodial locks with a single point control located at top of the window. Locate locking devices in the vent side rail. Fastenings for locks and keepers shall be concealed or non-removable.

2. Locking Device Strikes: Locate strikes in frame jamb. Strikes shall be adjustable for locking tension. Fabricate strikes from Type 304 stainless steel or white bronze.
3. Fabricate hinges of noncorrosive metal. Hinges may be either fully concealed when window is closed or semi-concealed with exposed knuckles. All exposed knuckle hinges shall have hospital tips, at both ends. Surface mounted hinges will not be accepted.
4. Guide Blocks: Fabricate guide blocks of injection molded nylon. Install guide block fully concealed in vent/frame sill.
5. Hardware for Emergency Ventilation of Windows:
 - a. Provide windows with a hold open linkage for emergency ventilation.
 - b. Hold open hardware shall provide for maximum six inches of window opening and shall include an adjustable friction shoe to provide resistance when closing the window.
 - c. Handles shall be removable.
6. Hardware to open upper 25% of window by maintenance personnel only

2.2 THERMAL AND CONDENSATION PERFORMANCE

- A. Condensation Resistance Factor (CRF): Minimum CRF of C 45.
- B. Thermal Transmittance:
 1. Maximum U value .30
- C. Solar Heat Gain Coefficient (SHGC):

2.3 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 replace glass without dismantling sash framing.
 4. Design rabbet to suit glass thickness and glazing method specified.
 5. Glaze from interior except where not accessible.
 6. Provide removable fin type glazing beads.
- C. 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. Reinforce 1.6 mm (0.062 inch) thick members with not less than 3 mm (1/8-inch) thick aluminum.
6. Except for strap anchors, provide reinforcing for fastening near ends and at intervals not more than 305 mm (12 inches) between ends.
7. Design to allow unrestricted expansion and contraction of members and window frames.
8. Secure to window frames with machine screws or expansion rivets.
9. Exposed screws, fasteners or pop rivets are not acceptable on exterior of the casing or trim cover system.

D. Thermal-Break Construction:

1. Low conductance thermal plastic barrier at minimum of 1 inch not polyurethane.
2. Capable of structurally holding sash in position and together.
3. All Thermal Break Assemblies (Pour & Debridge, Insulbar or others) shall be tested as per AAMA TIR A8 and AAMA 505 for Dry Shrinkage and Composite Performance.
4. Location of thermal barrier and design of window shall be such that, in closed position, outside air shall not come in direct contact with interior frame of the window.

E. Mullions: AAMA 101.

F. Subsills and Stools:

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.

2.4 FINISH

A. In accordance with NAAMM AMP 500 series.

B. Finish exposed aluminum surfaces as follows:

1. Fluorocarbon Finish: AAMA 2605, superior performing organic coating.

C. Hardware:

Finish hardware exposed when window is in the closed position:
Stainless Steel, Polished Aluminum or Match window color.

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 and to meet required wind loads.

- 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.
 7. Isolate aluminum from plaster, masonry, steel by giving aluminum a heavy coat of bituminous paint.
- E. Sills and Stools:
1. Set in bed of mortar or other compound to fully support, true to line shown.
 2. Do not extend sill to inside window surface or past thermal break.
 3. Leave space for sealants at ends and to window frame unless shown otherwise.
- F. 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 exterior and interior material and finishes 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 MULLIONS CLOSURES, TRIM, AND PANNING

- A. Cut mullion full height of opening and anchor directly to window frame on each side.
- B. Closures, Trim, and Panning: External corners mitered and internal corners coped, fitted with hairline, tightly closed joints.
- C. Secure to concrete or solid masonry with expansion bolts, expansion rivets, split shank drive bolts, or powder actuated drive pins.
- D. Toggle bolt to hollow masonry units, screwed through wood or metal.
- E. Fasten except for strap anchors, near ends and corners and at intervals not more than 300 mm (12 inches) between.
- F. Seal units following installation to provide watertight system.

3.4 ADJUST AND CLEAN

- A. Adjust ventilating sash and hardware to provide tight fit at contact points, and at weather-stripping for smooth operation and watertight 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.
- E. Except when a window is being adjusted or tested, keep locked in the closed position during the progress of work on the project.

3.5 OPERATION DEVICES

- A. Provide wrenches, keys or removable VA approved locking operating Handles, as specified to operate windows.
- B. Provide one emergency ventilating operating handle for every four windows.

3.6 CLEANING AND PROTECTION

- A. General: Upon completion of installation of metal windows, clean exposed surfaces of window units and sub-frames; comply with Fabricator's instructions. Remove excess and migrating joint sealing compounds, dirt, and foreign substances. Repair damaged areas of factory-applied finishes in accordance with Fabricator's instructions; comply with Project Director's requests. Continue maintenance of exposed finishes through remainder of construction period.
- B. Protection: Provide breakage protection promptly upon completion of fenestration installation. Install crossed streamers of cloth/plastic,

adhered to unit framing exterior faces. Maintain through construction completion.

C. Repair and Replacement: Touch up minor finish damage on metal surfaces where handling and installation have produced marred or abraded areas which can be readily corrected. Replace or refinish units where damage is of greater substance, as directed by Project Director.

D. Glazing: Clean glazing

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