A RECOMMENDED SPECIFICATION

Section 08520 – Aluminum Windows

PART 1: GENERAL

1.01 WORK INCLUDED

A. The conditions of the contract and applicable sections of division 1 hereby form a part of this section. Provide all labor, materials, tools, equipment and services to furnish and install aluminum windows and related components as shown on drawings and specified herein.

1.02 PERFORMANCE REQUIREMENTS

A. General
1. Provide certified independent laboratory test reports in full accord with section 1.02 paragraph C below.
2. Windows and component structural tests shall equal or exceed "Voluntary guide specifications for Aluminum Architectural Windows" as published by AAMA/NWWDA 101 I.S. 2-97 unless more stringent requirements are specified.
3. Windows shall be designed to meet Thermal Performance as certified by an accredited NFRC test laboratory. Tests shall be in accordance with NFRC 102-2001 test procedure.

B. Test Units
1. Perform all tests unless otherwise noted on projects largest size window or, to equal or exceed requirements set forth in AAMA 101-97., Sect. 2.2.4.4.

C. Test Procedures
1. Thermal Transmittance Test
(a) Units shall achieve standardized U-factor of 0.50 Btu/hr.ft2.F when tested in accordance per 1.02.A.3.
2. Air Infiltration Test (Perform before Water Test)
(a) Air Infiltration maximum 0.3 cfm per foot of crack length at 6.24 psf pressure differential when tested in accordance with ASTM E283-99.
3. Water Resistance Test
(a) No uncontrolled water leakage shall occur at 10.0 psf pressure differential with water rate 5 gallons/hr./sf. when tested in accordance with ASTM E331-00.
4. Uniform Load Deflection Test
(a) No glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or deflection of any unsupported span (meeting rails, muntins, frames, mullions, etc.) in excess of L/175 at both a positive and negative load of 60.0 psf (*design wind pressure) when tested in accord with ASTM E330-97
5. Uniform load structural test
(a) Unit to be tested at specified wind pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330-97.
(b) No Glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or permanent deformation of any main frame or ventilator section in excess of 0.4% of it's span.
6. Horizontal and Vertical Concentrated Load Tests on Ventilator Latch Rail
(a) Deflection at point of load application maximum 0.062" when tested per 1.02, A.2.
7. Vertical Concentrated Load Test on Intermediate Frame Rails
(a) Deflection at point of load application maximum 0.070" when tested per 1.02, A.2.
8. Balance Arm load Test
(a) Balance Arms shall function normally without apparent damage after loads are removed, when tested per 1.02.A.

1.03 SUBMITTALS

A. Shop Drawings/ Samples
1. Shop drawings complete and full scale where practical showing construction and components, dimensions and details.
2. Samples of anodized aluminum finishes shall be submitted on 6" sections of aluminum as required.
3. Samples of painted aluminum finishes shall be submitted on manufacturer's standard paint chips.

B. Test Reports/ Calculations (Optional)

C. Certified independent laboratory test reports verifying compliance with all test requirements of section 1.03, Paragraph C above.

* Design wind pressure obtained from ANSI A58.1, local building codes or specific boundary layer wind tunnel data.

1.04 WARRANTY

A. Aluminum windows and related materials: One year warranty on materials and workmanship.
B. Glass: One year warranty of thermal and physical integrity of insulated glass units.
C. Factory Glazing (Optional when Applicable).

PART 2: PRODUCTS

2.01 QUALITY ASSURANCE

A. Products of Torrance Aluminum , Perris, CA, Tel (951) 943-0430 are approved for use.
B. Other manufacturers desiring approval to bid must furnish certified test reports indicating full compliance with section 1.02, Paragraphs A, B & C and all other requirements of this specification 30 days prior to bid date.
C. Manufacturers shall have been engaged in the manufacture of aluminum windows of monumental grade not less than 10 years.

2.02 MATERIALS

A. Aluminum windows and Components
   1. Extruded aluminum prime billet 6063T5, aluminum sheet 5005H34.
   2. Minimum principal window member wall thickness shall be 1/8".
   3. Minimum frame and vent depth front to back shall be 2 1/2".
B. Hardware-General
   1. All steel components 300 series stainless steel (SS) i.e. strikes, fasteners, hold open arms, etc.
   2. All aluminum components shall be 6063T5 (T6).
   3. Locking handles and cases, white bronze.
C. Weatherstrip
   1. Extruded bulb vinyl meeting ASTM C509-70

2.03 FABRICATION

A. General
   1. Fabricate and shop assemble frame and sash members into complete windows under responsibility of one manufacturer.
   2. No bolts, screws or fastenings to impair independent frame movement.
   3. Provide thermal break by the pour & de-bridge method using solid urethane block.
B. Projected Ventilator
   1. Miter all corners and mechanically stake over solid aluminum corner block minimum ¼" thick, set and sealed in epoxy leaving hairline joinery then seal weather-tight. Joinery methods must not discolor finish or be unsightly.
C. Projected Frame
   1. Miter or cope all corners and mig weld or mortise and tenon each corner then seal weather-tight. Joinery methods must not discolor finish or be unsightly.
D. Weatherstripping
   1. Two rows (both inner & outer overlap contacts) of bulb type extruded vinyl weatherstrip in extruded races about perimeter of operating sash.
   2. securely stake and join at corners.
E. Glass Drainage
   1. Provision shall be made to insure that water will not accumulate and remain in contact with the perimeter areas of sealed insulating glass.
F. Hardware
   1. Balance Arms
      (a) Two stainless steel concealed four-bar adjustable friction hinges each ventilator meeting AAMA 904.1

   2. Locks
      (a) White bronze, and/or stainless steel and/or nylon construction locks, strikes and keepers for manual and/or custodial key operation to secure sash in closed position.
      (b) Provide two locks at sill of project-out sash or head of project-in ventilator when dimension exceeds 48".

3. Egress (OPTIONAL)
   (a) Equip one window minimum in each room with locking handles and strikes suitable for hand operation to to secure and/or release sash from closed position.
   (b) Hardware to meet provisions of the NFPA Life Safety Code 101.
4. Limit Stops (Optional)
   (a) Provide special hold-open device (if sash height permits application) or an incorporated stop with the four-bar friction hinge to permit sash to open approximately 6" and automatically stop. Operation past this point by custodial key only. See drawing for locations to receive this hardware.
   (b) Hold-open devices utilizing spring type mechanisms not permitted.
5. Note: Other types of hardware are available. For information and details consult Torrance Aluminum Window Co.

G. Finish

1. Finish of all exposed areas of aluminum windows and components shall be (choose from below) done in accord with the appropriate AAMA Voluntary Guide Specification shown.

ANODIZED FINISHES

AA M12C22 A31	Clear	.4 Mil, Class II
AA M12C22 A34	Medium Bronze	.4 Mil, Class II
AA M12C22 A34	Dark Bronze	.4 Mil, Class II
AA M12C22 A41	Clear	.7 Mil, Class I
AA M12C22 A44	Medium Bronze	.7 Mil, Class I
AA M12C22 A44	Dark Bronze	.7 Mil, Class I
AA M12C22 A44	Black	.7 Mil, Class I

PAINTED FINISHES

Kynar 500, Electrostatically applied with a minimum of 70% Fluoropolymer Resin, Class I

Color as selected by the Architect from manufacturer's standard colors. Special colors are available.
For detailed specifications and other surface treatments and finishes, contact Torrance Aluminum Window Co.

PART 3: EXECUTION

3.01 ERECTION

A. Install square, plumb and in true alignment and in accord with details and reviewed shop drawings. Surfaces free from dents, buckles, dimples, or other defects.
B. Anchor frames and other items securely to continuous construction to result in a rigid installation and in accord with Required safety factors. Where anchorage involves other work, provide setting drawings for proper installation.
C. Install hardware and adjust for proper operation. Seal metal to metal joints to prevent entrance of water except at points where frame members are designed to drain water to the exterior.
D. At juncture between frames and adjacent materials, seal entire perimeter on both sides. Use sealant and backing Materials as specified in section 07900-Sealants.
E. Protection of contact surfaces: Protect aluminum surfaces in contact with dissimilar metals or with incompatible Materials such as, concrete and cementitious materials, by painting contact surfaces with bituminous paint before installation or isolate with non-absorptive tape or gaskets.
F. Expansion and contraction: Install aluminum work so as to avoid objectionable distortion or overstress of parts and Fastenings resulting from thermal expansion and contraction.
G. Glazing
   1. Determine glass sizes and edge clearances by measuring actual openings.
   2. Set glass on glazing blocks to equally support the full glass height and prevent any give or fracture.
   3. Set glass with specified materials in accord with reviewed shop drawings and manufacturer's instructions.

3.02 PROTECTION AND CLEANING

A. After installation, clean metal and glass surfaces, on both interior and exterior, of all mortar, paint and other contaminants. Use no abrasives. Use mild soap and water.
B. After cleaning, protect all work against damage until date of Substantial Completion.