

SECTION 08520
ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Projected windows.
- B. Fixed windows.

1.2 RELATED SECTIONS

- A. Section 07900: Joint Sealers.
- B. Section 08400: Entrances and Storefronts.
- C. Section 08480: Balanced Entrance Doors.
- D. Section 08580: Special Function Windows.
- E. Section 08587: Pressure Resistant Windows.
- F. Section 08590: Window Restoration and Replacement.
- G. Section 08700: Hardware.
- H. Section 08800: Glazing.

1.3 REFERENCES

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - Voluntary Specification for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
- B. AAMA 701/702; 2000 - Combined Voluntary Specifications for Pile Weather strip and Replaceable Fenestration Weather Seals.
- C. AAMA 902; 1999 - Voluntary Specification for Sash Balances.
- D. AAMA 907 - Voluntary Specification for Corrosion Resistant Coatings on Carbon Steel Components.
- E. AAMA 910 - Voluntary "Life Cycle" Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors.
- F. AAMA 1503.1 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- G. AAMA 512-11 – Voluntary Specifications for Tornado Hazard Mitigation Fenestration Products.
- H. ANSI Z97.1 - American National Standard For Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test/Consumer Products Safety Commission CPSC 16 CFR 1201.

- I. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
- J. ASTM E 330; 1997 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- K. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- L. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
- M. ASTM F 588; 1997 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- N. LEED: The Leadership in Energy & Environmental Design; U.S. Green Building Council (USGBC).

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings:
 - 1. Elevation for each style window specified indicating its size, glazing type, muntin type and design.
 - 2. Manufacturer's head, jamb and sill details and section views for each window type specified.
- D. Schedules:
 - 1. Provide a window schedule indicating the type, size, color, , and operation of each unit specified. Coordinate with window mark types found in the Contract Drawings.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns. Samples may be subsequently installed on the project.
- G. Test Reports: Submit certified independent testing agency reports indicating window units meet or exceed specified performance requirements.
- H. LEED Submittals: Manufacturer's Product Data indicating compliance with the following LEED Credits:
 - 1. Energy and Atmosphere:
 - a. EA Credit 1 - Optimize Energy Performance.
 - b. EA Credit 2 - Renewable Energy.
 - 2. Materials and Resources:
 - a. MR Credit 4.1 - Recycled Content: 10 percent (post consumer and 1/2

- pre-consumer).
- b. MR Credit 4.2 - Recycled Content: 20 percent (post consumer and 1/2 pre-consumer).
- c. MR Credit 5.1 - Regional Materials: 10 percent extracted, processed and manufactured regionally.
- d. MR Credit 5.2 - Regional Materials: 20 percent extracted, processed and manufactured regionally.
- 3. Indoor Environmental Quality:
 - a. EQ Credit 4.1 - Low-Emitting Adhesives and Sealants.
 - b. EQ Credit 4.2 - Low-Emitting Paints.
 - c. EQ Credit 8.1 - Daylight and Views: Daylight 75 percent of spaces.
 - d. EQ Credit 8.2 - Daylight and Views: Views for 90 percent of spaces.

1.5 SYSTEM DESCRIPTION

- A. Test Units:
 - 1. Air, water and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA 101/I.S.2/A440.
- B. Test Procedures and Performance:
 - 1. Windows shall conform to AAMA/WDMA/CSA 101/I.S.2/A440 requirements for each window type.
 - 2. Air Infiltration Test:
 - a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 283 at static air pressure of 6.24 psf.
 - b. Air infiltration shall not exceed that specified for each Product.
 - 3. Water Resistance Test:
 - a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 331 and ASTM E 547 at static air pressure difference of 12 psf.
 - b. There shall be no uncontrolled water leakage.
 - 4. Uniform Load Deflection Test:
 - a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at static air pressure (positive and negative) difference of 100% design pressure.
 - b. During testing, no member shall deflect more than 1/175 of its span.
 - 5. Uniform Load Structural Test:
 - a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at static air pressure (positive and negative) difference 150% of design pressure.
 - b. At conclusion of test, there shall be no glass breakage; no permanent damage to fasteners, hardware parts, support arms, or actuating mechanisms; no other damage which would cause window to be inoperable.
 - 6. Condensation Resistance Test (CRF):
 - a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.
 - b. Condensation Resistance Factor (CRF) shall not be less than that specified for each Product.
 - 7. Thermal Transmittance Test (Conductive U-Value):
 - a. With window sash closed and locked, test unit in accordance with NFRC 100
 - b. Conductive thermal transmittance (U-Value) shall not exceed that specified for each Product.
 - 8. Life Cycle Test:
 - a. Test window in accordance with AAMA 910.

- b. At conclusion of test, there shall be no damage to fasteners, hardware parts, support arms, or actuating mechanisms; no other damage which would cause window to be inoperable. Subsequent air infiltration and water resistance tests shall not exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All windows and window hardware specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing windows of the same type and scope as specified.
- C. Provide test reports from AAMA accredited laboratory certifying that window units are found to be in compliance with AAMA/WDMA/CSA 101/I.S.2/A440-97 and performance standards listed above.
 - 1. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds criteria for the appropriate AAMA/WDMA/CSA 101/I.S.2/A440 test.
- D. Code Compliance: Provide windows that comply with regulations of the code bodies having jurisdiction.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Testing for Air and Water as specified
 - 4. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation in accordance with manufacturer's recommendations.
- B. Protect units against damage from the elements, construction activities and other hazards before, during, and after installation.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Winco Window Co., which is located at: 6200 Maple Ave. ; St. Louis, MO 63130-3305; Toll Free Tel: 800-525-8089; Tel: 314-725-8088; Web: www.wincowindow.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

- A. Aluminum:
 - 1. Frame: Extruded aluminum, 6063-T6 alloy and temper, tensile strength of 25,000 psi.
 - 2. Ventilator: Extruded tubular aluminum, 6063-T6 alloy and temper, tensile strength of 25,000 psi.
- B. Thermal Barrier:
 - 1. Poured-in-place structural thermal barrier shall transfer shear during bending and provide composite action between frame components.
 - 2. Thermal barrier pocket on aluminum extrusions shall be Azo-Braded to create a mechanical lock to improve the adhesion properties between the polyurethane polymer and the surface of the thermal barrier pocket.
 - 3. Window manufacturer must provide a warranty from the manufacturer of the polyurethane thermal barrier that warrants against product failure as a result of thermal shrinkage beyond 1/8 inch (3.2 mm) from each end and fracturing of the polyurethane for a period not to exceed ten years from the date of window manufacture.

2.3 THERMAL PROJECTED/FIXED WINDOWS – WINCO 1450S SERIES

- A. Acceptable Product:
 - 1. Winco 1450S Series: 4 inch Heavy Commercial Thermally Improved Window.
- B. Performance: AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Architectural Window: AW-80.
 - 2. Heavy Commercial: HC-80.
 - 3. Water Resistance, ASTM E 331: 12 psf (575 Pa).
 - 4. Water Resistance, ASTM E 547: 12 psf (575 Pa) for AW rated windows.
 - 5. Air Infiltration, ASTM E 283 at static air pressure of 6.24 psf: 0.03 cfm/sf.
 - 6. Uniform Load Structural Test, ASTM E 330: 120 psf (5748 Pa).
 - 7. Forced Entry Resistance, ASTM F 588: Grade 10.
 - 8. Condensation Resistance Factor (CRF), AAMA 1503.1:
 - a. Frame: 68
 - 9. Thermal Performance ("U" Value), AAMA 1503.1: 0.41 BTU/Hr-F^o-Ft².
- C. Frame: Thermally broken.
 - 1. Wall Thickness: 0.125 inches (3.175 mm)
 - 2. Depth: 4 inches (102 mm).
 - 3. Corners: Closely fit and mechanically fastened with screws. Must be sealed using AAMA approved sealants in a multi-step process to provide sealant redundancy.
 - 4. Bevel: Integral bevel on glazing leg or glazing bead.

- D. Ventilator and Access Sash:
 - 1. Vent Frame: Thermally broken.
 - 2. Wall Thickness: 0.125 inches (3.2 mm).
 - 3. Ventilator Depth: 2 inches (51 mm).
 - 4. Corners: Mitered and mechanically fastened with screws and sealed.
 - 5. Bevel: Integral bevel on glazing leg or glazing bead

2.4 SCREENS

- A. Frame: Extruded aluminum, 6063-T6 alloy and temper.
- B. Screen Fabric: 0.011 inch diameter 5154 alloy wire woven in 18 x 16 mesh.
 - 1. Color: Charcoal anodized.
 - 2. Color: Brite Kote aluminum.
- C. Screen Fabric: 0.009 inch diameter stainless steel wire woven in 18 x 16 mesh.
- D. Screen Fabric: 0.009 inch diameter fiberglass wire woven in 18 x 16 mesh.

2.5 FINISH

- A. Anodic Finish: All exposed areas of aluminum windows and components shall receive a two step finish: clear anodize components, then color coat with electrostatically deposited finish in accordance with Aluminum Association Designation AA-M12-C22-A, color as indicated.
 - 1. Color: To be selected by the Architect from the manufacturer's standard colors.
 - 2. Color: As noted in the Window Schedule.
 - 3. Color: A41, Class I clear anodized at 0.7 mils or greater in accordance with AAMA 611-98 (WINCO Finish 215).
 - 4. Color: A31, Class II clear anodized at 0.4 mils or greater in accordance with AAMA 611-98 (WINCO Finish 204).
 - 5. Color: A44, Class I color anodized at 0.7 mils or greater in accordance with AAMA 611-98 (WINCO Finish 311, 312 or 313).
 - 6. Color: _____.
- B. Paint Finish: Finish all exposed areas of aluminum windows and components with the following:
 - 1.70 percent Kynar in accordance with AA-M12-C42-R1X, AAMA 2605-98
 - 2.50 percent Kynar in accordance with AA-M12-C42-R1X, and AAMA 2604-98.
 - 3. Color: To be selected by the Architect from the manufacturer's standard colors.
 - 4. Color: As noted in the Window Schedule.
 - 5. Color: _____.

2.6 GLAZING

- A. Refer to Section 08800, Glazing: Glass and installation.
- B. Refer to Section 08800, Glazing: Glass installation.
- C. Glass Type: Insulating.
 - 1. Exterior Lite: 1/4 inch (6 mm)
 - 2. Air Space: 1/2 inch (12 mm).
 - 3. Interior Lite: 1/4 inch (6 mm)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Final operating adjustment shall be made after glazing work is complete. Operating sash and ventilator shall operate smoothly and shall be weathertight when in locked position
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION