

SECTION 08520
ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Projected 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. FEMA 361 - Design and Construction Guidelines For Community Safe Rooms
- I. 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.

- J. 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.
- K. ASTM E 330; 1997 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- L. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- M. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
- N. ASTM F 588; 1997 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- O. ASTM F1233 - Standard Test Method for Security Glazing Materials and Systems.
- P. ASTM F1642 - Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings.
- Q. GSA TS 01-2003 - US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings.
- R. 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.

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 AAMA 1503.1.
 - 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.
 9. Forced Entry Resistance Test: ASTM F 588, Type and Grade as indicated for each Product.
 10. Tornado Hazard Mitigating:
 - a. Test window in accordance with FEMA 361
 - b. Furnish windows capable of providing protection from winds as specified in ICC-500 Tornado Hazard Map.
 - c. Furnish window that will resist 3-second 180 mph design wind speed and tornado missile speed of 100 mph (15-lb 2X4)
 - d. A "Pass" test as identified in ICC-500 Chapter 8. Missile did not perforate

the glazing; The glazing remained attached to the glazing frame; Glass fragments or shards remained within the glazing unit.

- e. Anchors, clips, stops and other accessories shall be provided to comply with AAMA 101.1.S.2 and AAMA 907. Provide units and anchorage mechanism with sufficient strength to withstand required design pressure and strength for specified load conditions.

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;www.wincowindow.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600 and supply a complete window sample test data and other information deemed necessary by the owner and Architect.

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 FLUSH VENT PROJECTED/FIXED WINDOWS - WINCO 3350 SERIES

- A. Acceptable Product:
 - 1. Winco 3350 Series: 3-1/2 inch Heavy Commercial Thermally Improved Window.
- B. Performance: AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Architectural Window: AW-80.
 - 2. Water Resistance, ASTM E 331: 12 psf (575 Pa).
 - 3. Water Resistance, ASTM E 547: 12 psf (575 Pa) for AW rated windows.
 - 4. Air Infiltration, ASTM E 283 at static air pressure of 6.24 psf: 0.05 cfm/sf.
 - 5. Uniform Load Structural Test, ASTM E 330: 120 psf (5748 Pa).
 - 6. Forced Entry Resistance, ASTM F 588: Grade 10.
 - 7. Condensation Resistance Factor (CRF), AAMA 1503.1:
 - a. Frame: 63.
 - b. Glass: 66.
 - 8. Thermal Performance ("U" Value), AAMA 1503.1: 0.39 BTU/Hr-F°-Ft2.
 - 9. Blast Resistant: Provide a complete blast resistant window assembly meeting UFC 4-010-01. Reference the Project Blast Load Table for specific Charge Weights and Standoff distances per elevation.
- C. Ventilator and Access Sash:
 - 1. Vent Frame: Thermally broken.
 - 2. Vent and access panel shall be flush with exterior frame when closed. Overlap sash is unacceptable.
 - 3. Wall Thickness: 0.125 inches (3.2 mm).
 - 4. Ventilator Depth: 3-5/16 inches (84 mm).
 - 5. Corners: Mitered and mechanically fastened with screws and sealed.

2.4 HARDWARE

- A. Hinged Sash Supports: Stainless steel four bar arms.

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. Glazing Bead, for Tornado Resistant Windows:
 - 1. Window Series: Winco 3350 Series 3-1/2 inch Heavy Commercial.
 - a. Glazing Bead: 1-11/16 inch (43 mm) with screwed-in glazing bead.

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