

4500 Series

4" Heavy Commercial
Thermally Improved Window
Double Hung

SECTION 085113 ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fixed windows.
- B. Double Hung windows.
- C. Blast resistant windows.
- D. Impact resistant windows.

1.2 RELATED SECTIONS

- A. Section 07900: Joint Sealers.
- B. Section 081316: Aluminum Terrace Doors.
- C. Section 08400: Entrances and Storefronts.
- D. Section 08490: Balanced Entrance Doors.
- E. Section 085653: Wind and Impact Security Windows.
- F. Section 08580: Special Function Windows.
- G. Section 08587: Pressure Resistant Windows.
- H. Section 08590: Window Restoration and Replacement.
- I. Section 08700: Hardware.
- J. 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. 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.
- H. 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.

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- I. ASTM E 330; 1997 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- J. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- K. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
- L. ASTM F 588; 1997 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- M. ASTM F1233 - Standard Test Method for Security Glazing Materials and Systems.
- N. ASTM F1642 - Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings.
- O. GSA TS 01-2003 - US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings.
- P. LEED: The Leadership in Energy & Environmental Design; U.S. Green Building Council (USGBC).
- Q. ASTM E 1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
- R. ASTM E 1996 – Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes. Miami-Dade County Protocols:
 - 1. PA 201-94 - Impact Test Procedures.
 - 2. PA 203-94- Cyclical Loading Test Procedures.
- S. Florida Building Code Protocols:
 - 1. TAS 201-94, Impact Test Procedures.
 - 2. TAS 202-94, Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading.
 - 3. TAS 203-94, Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
- T. UFC 4-010-01 Unified Facilities Criteria (UFC) - Department of Defense Minimum Antiterrorism Standards for Buildings.

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.

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- 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.

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- 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. Blast Resistance Testing:
 - a. Furnish windows capable of providing "low level of protection" or better, as defined in UFC 4-010-01, the DOD Anti-Terrorism Standard for Buildings, at the design blast load.
 - b. Furnish window that do not transmit excessive loads to the structure at the design blast load.
 - c. Provide Live Explosive Test Results and/or Independent Professional Engineer Calculations to indicate the ability of the window to be anchored into the type of wall specified in the Project.
 - d. 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 blast design pressure and strength for specified load conditions.
 - e. Fastener, clips and other accessories shall be capable of delivering blast and rebound reactions to the adjacent structure.
 - f. All screens, hardware, trim and covers must be sufficiently tested using live explosives to ensure that they do not disengage during an explosion.

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.

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- 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., 6200 Maple Ave., St. Louis, MO 63130-3305. ASD. Toll Free: 800-525-8089. Tel: 314-725-8088. Fax: 314-725-1419. Web: www.wincowindow.com.
- B. Substitutions: Not permitted.
- C. 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.

2.3 THERMAL DOUBLE HUNG WINDOWS – WINCO 4500 SERIES

- A. Acceptable Product:
 1. Winco 4500 Series: 4 inch Heavy Commercial Thermally Improved Double Hung Window.
 2. Winco 4500 Blast Resistant Series: 4 inch Heavy Commercial Thermally Improved Double Hung Blast Resistant Window.
 3. Winco 4500 Impact Resistant Series: 4 inch Heavy Commercial Thermally Improved Double Hung Impact Resistant Window.
- B. Performance: AAMA/WDMA/CSA 101/I.S.2/A440.
 1. Architectural Window: AW-60.
 2. Water Resistance, ASTM E 331: 10 psf (478 Pa).
 3. Water Resistance, ASTM E 547: 10 psf (478 Pa) for AW rated windows.
 4. Air Infiltration, ASTM E 283 at static air pressure of 6.24 psf: 0.21 cfm/sf.
 5. Uniform Load Structural Test, ASTM E 330: 90 psf (4309.2 Pa).
 6. Forced Entry Resistance, ASTM F 588: Grade 10.
 7. Condensation Resistance Factor (CRF), AAMA 1503.1:
 - a. Frame: 58.
 - b. Glass: 55.
 8. Thermal Performance ("U" Value), AAMA 1503.1: 0.45 BTU/Hr-F°-Ft².
 9. Blast Resistant: Provide a complete blast resistant window assembly meeting UFC 4-010-01.
 10. Provide impact resistant window assembly meeting either FBC 2007 – HVHZ Protocols; Miami-Dade

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protocols; or ASTM E1886 and ASTM E1996 (Level D) Protocols

- C. Frame: Thermally broken.
 - 1. Wall Thickness: 0.090 inches (2.3 mm).
 - 2. Depth: 4 inches (101.6 mm).
 - 3. Sill Wall Thickness: 0.125 inches (3.175 mm).
 - 4. Corners: Closely fit and mechanically fastened with screws. Must be sealed using AAMA approved sealants in a multi-step process to provide sealant redundancy.
 - 5. Leg: Provide equal leg frame.

- D. Ventilator:
 - 1. Vent Frame: Thermally broken.
 - 2. Wall Thickness: 0.080 inches (2.032 mm).
 - 3. Corners: Mitered and mechanically fastened with screws. Joinery is sealed with small joint sealant with AAMA approved small joint sealant.
 - 4. Each vent shall have one row of heavy fin wool pile weather stripping and one row of ridged vinyl installed in specifically designed weather strip pockets for the extrusion.

- E. Weather Strip
 - 1. Each vent shall have one row of heavy fin wool pile weather stripping and one row of ridged vinyl installed in specifically designed weather strip pockets for the extrusion.

- F. Thermal Barrier
 - 1. Poured-in-place structural thermal barrier shall transfer 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.
 - 4. Thermal barriers made of crimped in place polyamide (insulbar®) strips are not acceptable unless all strips are covered and tooled with Dow 795 silicone caulking to climate water migration.

2.4 HARDWARE

- A. Locks:
 - 1. Cam type locking handles; white bronze alloy with US25D brushed finish.
 - 2. Pole ring cam lock.
 - 3. Pole ring snap lock.
 - 4. Key lock.
 - 5. Casement lock (multi-point lock).

- B. Operator:
 - 1. 4 –bar arms conforming to AAMA 904.1.
 - 2. 4 –bar casement arms conforming to AAMA 904.1.
 - 3. Friction adjustable HOA arms.
 - 4. Key release limit arms.
 - 5. Roto-Operator: Pivot shoe. ADA handle where indicated.
 - 6. Stainless steel.

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- C. Hinge:
 - 1. 5 knuckle butt hinge with stainless steel pin.
 - 2. 4-bar casement hinge.
- D. Balances:
 - 1. Shall be tested in accordance with AAMA 902, "Voluntary Specification for Sash Balances.
 - 2. Shall meet all minimum Class 1 requirements with a minimum 0.70 Manually Applied Force Ratio (MAF).
 - 3. Shall comply with 902 Class 1 Manually Applied Force Ratio.
 - 4. Shall be attached to locking carrier system, which slides on rails extruded in jamb frame. Mounting brackets screw attached to sash are not acceptable.

-OR-

- E. Balances:
 - 1. Shall be high performance sash balances tested in accordance with AAMA 902 Voluntary Specification for Sash Balances.
 - 2. Shall meet all minimum Class 5 requirements with a minimum 0.30 Manually Applied Force Ratio (MAF).
 - 3. Shall be of appropriate size and capacity to hold sash in position in accordance with ANSI/AAMA/NWDA 101-88, Section 2.2.3.3.2 and AAMA 902 Section 8.1.
 - 4. Shall be attached to locking carrier system, which slides on rails extruded in jamb frame. Mounting brackets screw attached to sash are not acceptable.
- F. Simulated Double Hung Window: Provide all components for a complete double hung reproduction window.
 - 1. Acceptable Product: Winco Heavy Commercial Thermally Improved Simulated Double Hung Reproduction Window.
- G. Blind Sash Fasteners: Stainless steel ramp clamp secured with minimal fasteners.
- H. Hinged Sash Supports: Stainless steel four bar arms.
- I. Handle: Pull handle.
- J. Hold Open: Hold open arms.
- K. Push Bar: Under screen push bar.
- L. Sign: Emergency exit sign.

2.5 TRIM AND PANS

- A. Provide trim and pans as indicated on Drawings.
- B. Sub Frame and Closure Plate.
- C. Sill Starter.
- D. Winco Sills: _____ inches (_____ mm).
- E. Sub-Sill: _____ Series.
- F. Sill Extension: _____ inches (_____ mm).
- G. PVC Comp. Channel (Frame Filler): For _____ inch (_____ mm) frame depth.
- H. Strap Anchor.
- I. Snap Cover: Part # _____.

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- J. Base Clip: Part # _____.
- K. Replacement Pan Systems:
 - 1. Pan Head, Jamb and Sill: Part # _____.
 - 2. Pan Head and Jamb: For use with Part # _____.
 - 3. Pan Extender: For use with Part # _____.
 - 4. Pan Sill: For use with Part # _____.
 - 5. Pan Sill: Part # _____.
 - 6. Pan Jamb: Part # _____.
 - 7. Pan Head: Part # _____.
 - 8. Multi-Purpose Pan: Part # _____.
- L. Blast Tested Trim:
 - 1. Blast Receptor: Blast receptor with exterior installed closure plate.
 - 2. Blast Snap Trim: 2 inch by 2 inch (51 mm by 51 mm).
 - 3. Blast Snap Trim: 2 inch by 1-1/4-1/2 inch (51 mm by 38 mm).

2.6 SCREENS

- A. Frame: Extruded aluminum, 6063-T6 alloy and temper.
 - 1. Screen mounting holes shall be pre-drilled at the factory
- B. Screen Fabric: 0.011 inch (0.2194 mm) 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 (0.2286 mm) diameter stainless steel wire woven in 18 x 16 mesh.

2.7 BLINDS

- A. Head Rail: 1.085 inch wide by 0.875 inch high by 0.050 inch thick (27 mm by 22 mm by 1.3 mm).
- B. Bottom Rail: 1 inch wide by 0.355 inch high by 0.050 inch thick (25 mm by 9 mm by 1.3 mm).
- C. Rail Material: 6063-T5 extruded aluminum alloy and temper with a baked on polyester powder coat finish conforming to AAMA 603.8-1985.
- D. Ladder Cord Locations: Shall not exceed 6 inches (152 mm) from end of the slot or 24-1/2 inches (610 mm) apart.
- E. Tilt Control: Tilt control knob shall have slip feature to minimize damage due to over tilting of blind.
- F. Tilt Control: Provide angled tilt control knobs.
- G. Knobs: Provide removable key operated knobs.
- H. Knobs: Provide Low Profile knobs.
- I. Knobs: Provide Thumb turn knobs.

2.8 MULLIONS

- A. Mullion:
 - 1. Non-Thermal Mullion: Part # _____.
 - 2. Thermal Mullion: Part # _____.
 - 3. Blast Resistant Mullion: Part # _____; in accordance with UFC 4-010-01.
 - a. Maximum Deflection: L/60.

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- b. Static Pressure: 1 psi (0.07 kg/cm).
- 4. Provide mullions as indicated on Drawings.

B. Window Depth: _____ inches (_____ mm).

C. Winco Window Series: _____.

D. Stack:

- 1. Vertical.
- 2. Horizontal.

2.9 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 Clear).
 - 4. Color: A31, Class II clear anodized at 0.4 mils or greater in accordance with AAMA 611-98 (WINCO Finish 110 Champagne).
 - 5. Color: A44, Class I color anodized at 0.7 mils or greater in accordance with AAMA 611-98 (WINCO Finish 111 Light Bronze, 112 Medium Bronze or 113 Dark Bronze, 115 Black).
- 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: _____.

2.10 GLAZING

- A. Refer to Section 08800, Glazing: Glass and installation.
- B. Refer to Section 08800, Glazing: Glass installation.
- C. Glazing: All units shall be factory glazed with butyl tape, silicone cap bead on the exterior, with glazing vinyl and extruded snap-in aluminum glazing bead on the interior.
 - 1. Interior glazed.
 - 2. Exterior glazed.
 - 3. Tinted Glass: (Tint Color) _____, (Product Name) _____ as manufactured by _____ with bronze colored spacer.
 - 4. Reflective Glass: (Color) _____, (Product Name) _____ as manufactured by _____ with bronze colored spacer.
- D. Blind Window Glazing: Windows shall be interior glazed; exterior light shall be structurally glazed, and interior light shall be marine glazed.
- E. Glass Type: Insulating.
 - 1. Exterior Lite: _____ inch (_____ mm) _____.
 - 2. Air Space: _____ inch (_____ mm).
 - 3. Interior Lite: _____ inch (_____ mm) _____.

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- F. Glass Type: Monolithic; _____.
- G. Glass Type: Impact Resistant, as follows:
 - 1. Laminated Glass for Winco 4500 Series Large Missile Impact (LMI) Windows: 1/4-1/2 inch heat strengthened outer lite with 0.090 inch Saflex interlayer and 1/4-1/2 inch heat strengthened inner lite.
 - 2. Insulated Glass for Winco 4500 Series Large Missile Impact (LMI) Windows: Laminated exterior lite (3/16 inch heat strengthened outer lite with 0.090 inch Saflex interlayer and 3/16 inch heat strengthened inner lite), 3/16 inch air space with 3/16 heat strengthened inner lite.
- H. Glazing Bead, Blast Resistant Windows:
 - 1. Window Series: Winco 4500 Series 4 inch Heavy Commercial.
 - a. Glazing Bead: ¼ inch (6.35 mm).
 - b. Glazing Bead: 1 inch (25.4 mm).
- I. Glazing Bead, Dual Glazed: Exterior lite 1/4-1/2 inch (6.4 mm) monolithic, interior lite 1/8 inch (3.2 mm) monolithic.
- J. Glazing Bead, Dual Glazed: Exterior lite 1/4-1/2 inch (6.4 mm) monolithic, interior lite 5/8 inch (16 mm) insulated.
- K. Glazing Bead, Panel: 2 inches (63.5 mm), maximum.

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