



SECTION 08 35 13

ALUMINUM BI-FOLDING GLASS DOORS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum Bi-Folding Glass Doors:
 - 1. Series 9500: Thermally broken.
 - 2. Series 7950: Thermally broken.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 06 20 00 - Finish Carpentry.
- C. Section 07 90 00 - Joint Protection.
- D. Section 08 70 00 - Hardware.

1.3 REFERENCES

- A. Aluminum Anodizers Council (AAC):
 - 1. AAC Class 1 -Anodized Architectural Aluminum Coatings.
- B. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA/WDMA/CSA/101/I.S.2/A440-11 - North American Fenestration Standard/Specification for windows, doors, and skylights.
 - 2. AAMA 611.98 - Voluntary Specification for Anodized Architectural Aluminum.
 - 3. AAMA 2605 - Voluntary Specifications, Performance Requirements and Test Procedures for Pigmented for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- C. American National Standards Institute (ANSI):
 - 1. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.
- D. ASTM International (ASTM):
 - 1. ASTM C1036 - Standard Specification for Flat Glass.
 - 2. ASTM E 283 - Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 3. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

4. ASTM E 547 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 5. ASTM E774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units.
- E. Consumer Product Safety Commission (CPSC):
1. CPSC 16CFR-1201 - Safety Standard for Architectural Glazing Materials.
- F. National Fenestration Rating Council (NFRC):
1. NFRC 100 - Procedure for Determining Fenestration Product U-factors.
 2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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: Include outside net frame dimensioning, direction of swing (outswing or inswing), number of panels, folding configuration of panels left or right, identify main entry swing panel, typical head, side jamb, sill and panel details and type of glazing material per vertical plan and elevations view drawings.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (152 mm) square, representing actual product, color, and patterns.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- F. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment of cable tension and periodic cleaning and maintenance of all railing and infill components.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide complete, sliding door system by a single source manufacturer with at least 5 years documented experience manufacturing folding door systems in the U.S.
- B. Installer Qualifications: Installer with documented experienced in the installation of manufacturer's sliding door systems or similar and screen system to the products specified.
- C. 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. Remodel mock-up area as required to produce acceptable work.
- D. Pre-Installation Meetings: Conduct pre-installation meetings to verify project requirements, substrate conditions, construction documents, details and manufacturer's warranty requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged rolls/pallets with identification labels intact.
- B. Storage and Protection: Protect stored product from damage. Store products flat in dry, well ventilated area out of direct sunlight, under cover, protected from weather, moisture and excessive dryness and construction activities.

1.7 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

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 recommended limits.

1.9 WARRANTY

- A. Provide manufacturer's standard limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Western Window Systems, which is located at: 2200 E. Riverview Dr.; Phoenix, AZ 85034; ASD Toll Free Tel: 877-268-1300; Fax: 602-243-3119; Email: [request info \(bleizerowicz@westernws.com\)](mailto:bleizerowicz@westernws.com); Web: <https://www.wwscommercial.com>
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 ALUMINUM BI-FOLDING GLASS DOORS

- A. Basis of Design: Series 9500: Thermally broken aluminum bi-folding glass doors as manufactured by Western Window Systems.
 - 1. Multiple bi-folding door system including head, side jambs, thresholds and aluminum sliding panels to sizes indicated on the Drawings.
 - 2. Performance Requirements:
 - a. Air Infiltration Per ASTM E 283: _____.
 - b. Water Infiltration Per ASTM E 547: _____.
 - c. Uniform Load Structural Per ASTM E 330: _____.
 - d. Uniform Load Design Pressure: _____.
 - e. Overall Design Pressure Rating: DP20.
 - f. Certifications:
 - 1) AAMA/WDMA/CSA/101/I.S.2/A440-11, R-PG20.
 - 2) NFRC 100 for U-factor.
 - 3) NFRC 200 for Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT).
 - 3. Stacking Configuration: Sliding door system including head, side jambs,

- thresholds and aluminum sliding panels.
4. Frame and Panels:
 - a. Panels: Thermally broken, extruded aluminum stile, 6063-T5, and rail panels with standard one lite.
 - 1) Panel Swing: Inward.
 - 2) Panel Swing: Outward.
 - 3) Panel Width: 42 inches (1067 mm) maximum.
 - 4) Panel Height: 144 inches (3658 mm) maximum.
 - 5) Number of Consecutive Panels: 16 panels maximum, eight in each direction.
 - 6) Stile and Rail: 2.25 by 3.5 inch (57 by 89 mm).
 - b. Frames and Sills: Extruded aluminum.
 - 1) Sill Depth: 4.50 inch (114 mm).
 - 2) Frame Width (inches / mm): _____.
 - c. Construction:
 - 1) Frame members fitted and mechanically joined at corners with stainless steel screws.
 - 2) Secured with tie rod assembly to ensure a permanent rigid connection at the top and bottom corners of the door panel.
 - 3) Glazing secured with extruded aluminum snap-in stops, removable for glazing and regaling.
 - d. Weatherstripping: Weather seal inserted in frame and sill to provide perimeter seal, as well as between door panels.
 - 1) Q-LON at the door jambs, and head and sill track.
 - 2) Q-LON at the panel stiles.
 - 3) Wool pile at the top and bottom rails at the panels.
 5. Glass: All glass to comply with safety glazing requirements of ANSI Z97.1 and CPSC 16CFR 1201.
 - a. Glazing: Argon Filled with LowE coating on No. 2 surface, from Cardinal Glass Industries.
 - 1) Glazing Type: LoE-270 all-climate coated glass.
 - 2) Glazing Type: LoE-366 high performance glass.
 - 3) Glazing Type: LoE-340 laminated, solar, and glare control glass.
 - 4) Glazing Type: As determined by the Architect.
 - 5) Glazing Type: _____.
 - 6) Enhanced Low-E Coating Used with Glazing Type Above: LoE-i89 enhanced winter performance glass.
 - 7) Overall Thickness: 1 inch (25 mm).
 - 8) Overall Thickness: As determined by the Architect.
 - 9) U-Factor: 0.52.
 - 10) U-Factor: As determined by the Architect.
 - 11) U-Factor: _____.
 6. Multi-point concealed stainless steel locking system securing large bi-folding panels with locking hardware located in the panels.
 7. Locking Hardware and Handles: Manufacturer's premium one-piece handle. Handle Height (inches / mm): _____ from bottom of panel.
 - a. Keyed cylinder, Schlage 5-pin.
 - b. Finish: Brushed nickel.
 - c. Finish: Black finish.
 8. Locking Hardware and Handles: Manufacturer's standard D-shaped pull handle at the bi-fold pivot points. Handle Height (inches / mm): _____ from bottom of panel.
 - a. Finish: Stainless steel.
 - b. Finish: Black finish.
 9. Locking Hardware and Handles: Inactive lock handle, at pivot points, secures door panels with steel pins at the head and sill. Handle Height (inches / mm):

- _____ from bottom of panel.
- a. Finish: Brushed nickel.
- b. Finish: Black finish.
- 10. Rolling Hardware and hinges: Stainless steel.
 - a. Head Load Carrier Hinges; Heavy Duty: 264 lbs (120 kg) capacity.
 - b. Head Load Carrier Hinges (lbs / kg): 250 capacity.
 - c. Bottom Load Carrier Hinges: 176 lbs (80 kg) capacity.
 - d. Bottom Load Carrier Hinges (lbs / kg): _____ capacity.
- 11. Sill Tracks; Bottom Load: Water barrier sill.
 - a. Interior Leg: 2.51 inches (63.7 mm).
 - b. Threshold: Finished to match frame color.
- 12. Sill Tracks; Bottom Load: Flush sill.
 - a. Interior Threshold Height: 1.76 inches (44.7 mm)
 - b. Threshold: Finished to match frame color.
- 13. Sill Tracks; Top Load: Water barrier sill.
 - a. Interior Leg: 1.82 inches (46.2 mm).
 - b. Threshold: Finished to match frame color.
- 14. Sill Tracks; Top Load: Flush sill.
 - a. Interior Threshold Height: 1.07 inches (27.2 mm)
 - b. Threshold: Finished to match frame color.
- 15. Sill Tracks; Top Load: U Track. Interior use only.
 - a. Finish: Dark bronze.
- 16. Aluminum Finish:
 - a. Provide same finish on inside and outside.
 - 1) Anodized Finish AAC - Class 1 Color: Satin.
 - a) Per AAMA 611.98.
 - 2) Anodized Finish AAC - Class 1 Color: Dark bronze.
 - a) Per AAMA 611.98.
 - 3) Paint Finish per AAMA - 2605 minimum.
 - a) Color: Hillside bronze.
 - b) Color: Bison beige.
 - c) Color: Navajo white.
 - d) Color: Briar.
 - e) Color: Stonish beige.
 - f) Color: Autumn night.
 - g) Color: Warmtone.
 - h) Color: Cinnamon toast.
 - i) Color: Western white.
 - j) Color: As determined by the Architect.
 - k) Color: _____.

B. Basis of Design: Series 7950: Thermally broken aluminum bi-folding glass doors as manufactured by Western Window Systems.

- 1. Multiple bi-folding door system including head, side jambs, thresholds and aluminum sliding panels to sizes indicated on the Drawings.
- 2. Performance Requirements:
 - a. Air Infiltration Per ASTM E 283: _____.
 - b. Water Infiltration Per ASTM E 547: _____.
 - c. Uniform Load Structural Per ASTM E 330: _____.
 - d. Uniform Load Design Pressure: _____.
 - e. Overall Design Pressure Rating: DP50.
 - f. Certifications:
 - 1) AAMA/WDMA/CSA/101/I.S.2/A440-11, PG50.
 - 2) NFRC 100 for U-factor.
 - 3) NFRC 200 for Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT).

3. Stacking Configuration: Sliding door system including head, side jambs, thresholds and aluminum sliding panels.
4. Frame and Panels:
 - a. Panels: Thermally broken, extruded aluminum stile, 6063-T6, and rail panels with standard one lite.
 - 1) Panel Swing: Inward.
 - 2) Panel Swing: Outward.
 - 3) Panel Width: 42 inches (1067 mm) maximum.
 - 4) Panel Height: 144 inches (3658 mm) maximum.
 - 5) Number of Consecutive Panels: 16 panels maximum, eight in each direction.
 - 6) Stile and Rail: 2.25 by 3.17 inch (57 by 94 mm).
 - b. Frames and Sills: Extruded aluminum.
 - 1) Sill Depth: 5-7/8inch (114 mm).
 - 2) Frame Width (inches / mm): _____.
 - c. Construction:
 - 1) Frame members fitted and mechanically joined at corners with stainless steel screws.
 - 2) Secured with tie rod assembly to ensure a permanent rigid connection at the top and bottom corners of the door panel.
 - 3) Glazing secured with extruded aluminum snap-in stops, removable.
 - d. Weatherstripping: Weather seal inserted in frame and sill to provide perimeter seal, as well as between door panels.
 - 1) Q-LON at the door jambs, and head and sill track.
 - 2) Q-LON at the panel stiles.
 - 3) Wool pile at the top and bottom rails at the panels.
5. Glass: All glass to comply with safety glazing requirements of ANSI Z97.1 and CPSC 16CFR 1201.
 - a. Glazing: Argon Filled with LowE coating on No. 2 surface, from Cardinal Glass Industries.
 - 1) Glazing Type: LoE-270 all-climate coated glass.
 - 2) Glazing Type: LoE-366 high performance glass.
 - 3) Glazing Type: LoE-340 laminated, solar, and glare control glass.
 - 4) Glazing Type: As determined by the Architect.
 - 5) Glazing Type: _____.
 - 6) Enhanced Low-E Coating Used with Glazing Type Above: LoE-i89 enhanced winter performance glass.
 - 7) Overall Thickness: 1 inch (25 mm).
 - 8) Overall Thickness: 1.3 inch.
 - 9) Overall Thickness: 1.6 inch.
 - 10) Overall Thickness: As determined by the Architect.
 - 11) U-Factor: 0.31.
 - 12) U-Factor: As determined by the Architect.
 - 13) U-Factor: _____.
6. Multi-point concealed stainless steel locking system securing large bi-folding panels with locking hardware located in the panels.
7. Locking Hardware and Handles: Manufacturer's premium one-piece handle. Handle Height (inches / mm): _____ from bottom of panel.
 - a. Keyed cylinder, Schlage 5-pin.
 - b. Finish: Brushed nickel.
 - c. Finish: Black finish.
8. Locking Hardware and Handles: Manufacturer's standard D-shaped pull handle at the bi-fold pivot points. Handle Height (inches / mm): _____ from bottom of panel.
 - a. Finish: Stainless steel.

- b. Finish: Black finish.
- 9. Locking Hardware and Handles: Inactive lock handle, at pivot points, secures door panels with steel pins at the head and sill. Handle Height (inches / mm): _____ from bottom of panel.
 - a. Finish: Brushed nickel.
 - b. Finish: Black finish.
- 10. Rolling Hardware and hinges: Stainless steel.
 - a. Head Load Carrier Hinges; Heavy Duty: 264 lbs (120 kg) capacity.
 - b. Head Load Carrier Hinges (lbs / kg): 250 capacity.
- 11. Sill Tracks; Top Load: Water barrier sill.
 - a. Interior Leg: 2.00 inches (50.8 mm).
 - b. Threshold: Finished to match frame color.
- 12. Sill Tracks; Top Load: Flush sill.
 - a. Interior Threshold Height: .96 inches (24.4 mm).
 - b. Threshold: Finished to match frame color.
- 13. Sill Tracks; Top Load: U Track. Interior use only.
 - a. Finish: Dark bronze.
- 14. Aluminum Finish:
 - a. Provide same finish on inside and outside.
 - 1) Anodized Finish AAC - Class 1 Color: Satin.
 - a) Per AAMA 611.98.
 - 2) Anodized Finish AAC - Class 1 Color: Dark bronze.
 - a) Per AAMA 611.98.
 - 3) Paint Finish per AAMA - 2605 minimum.
 - a) Color: Hillside bronze.
 - b) Color: Bison beige.
 - c) Color: Navajo white.
 - d) Color: Briar.
 - e) Color: Stonish beige.
 - f) Color: Autumn night.
 - g) Color: Warmtone.
 - h) Color: Cinnamon toast.
 - i) Color: Western white.
 - j) Color: As determined by the Architect.
 - k) Color: _____.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
- B. Verify dimensions of openings fit net frame dimensions of door system. verify openings are level, plumb, and square, with no unevenness.
- C. Verify maximum deflection of header with the live load does not exceed the lesser of L/720 of the span and 1/4 inch (6 mm). Structural support for lateral loads including both wind load and when the panels are stacked open) must be provided.
- D. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions, recommendations, and approved submittals.

- B. Flash and waterproof the perimeter of the opening and frame.
- C. Securely fit frame, level, straight, plumb and square. Install frame in proper elevation, plane and location, and in proper alignment with other work.
- D. Ensure doors are adjusted for proper operation.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Protect thresholds and floor channels from construction traffic.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION