SECTION 083513 - FOLDING GLASS DOORS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing and installing a top-hung sliding-folding aluminum-framed glass door or storefront system that includes:

1. Aluminum frame.
2. Threshold.
3. Panels.
4. Sliding-folding and locking hardware.
5. Weather stripping.
6. Glass and glazing.
7. Insect screen (optional).
8. Accessories as required for a complete working installation.

B. Related Documents and Sections: Contractor to examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to, the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 General Requirements, Specification Sections, apply to this Section.
2. Section 061000, Rough Carpentry: Wood framing R.O. and blocking.

1.02 REFERENCES

A. Reference Standards in accordance with Division 01 and current editions from the following:

1. AAMA. American Architectural Manufacturers Association; www.aamanet.org
   a. AAMA 502, Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
   b. AAMA 611, Voluntary Specification for Anodized Architectural Aluminum.
   c. AAMA 920, Operation / Cycling Performance.
   d. AAMA 1303.5, Voluntary Specification for Forced Entry Resistant Aluminum Sliding Glass Doors.
   e. AAMA 2604, Voluntary Specifications, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   f. AAMA 2605, Voluntary Specifications, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
   g. AAMA CAWM 300, Forced Entry Resistance for Sliding Glass Doors.
2. ANSI. American National Standards Institute; www.ansi.org
   a. ANSI Z97.1, Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.
3. ASTM. ASTM International; www.astm.org
   a. ASTM C1036, Standard Specification for Flat Glass.

b. ASTM C1048, Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.

c. ASTM E90-09, Standard Test Method for Laboratory Measurements of Airborne Sound Transmission Loss of Building Partitions and Elements.

d. ASTM E283, Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

e. ASTM E330, Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

f. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

g. ASTM E413, Classification for Rating Sound Insulation.

h. ASTM E547, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.

i. ASTM E1332, Standard Classification for Rating Outdoor-Indoor Sound Attenuation.

4. CPSC. Consumer Product Safety Commission; www.cpsc.gov
   a. CPSC 16CFR-1201, Safety Standard for Architectural Glazing Materials.
5. NFRC. National Fenestration Rating Council; www.nfrc.org
   a. NFRC 100, Procedure for Determining Fenestration Product U-factors.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate Folding Glass Storefront system and framing R.O.

B. Preinstallation Meetings: See Section 01 30 00.

1.04 SUBMITTALS

A. For Contractor submittal procedures see Section 01 30 00.

B. Product Data: Submit manufacturer's printed product literature for each Folding Glass Storefront system to be incorporated into the Work. Show performance test results and details of construction relative to materials, dimensions of individual components, profiles, and colors.

C. Product Drawings: Indicate Folding Glass Storefront system component sizes, dimensions and framing R.O., configuration, swing panels, direction of swing and stacking, typical head jamb, side jambs and sill details, type of glazing material, handle height.

D. Installation, Operation and Maintenance Data: Submit Owner's Manual from manufacturer. Identify with project name, location and completion date, and type and size of unit installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer capable of providing complete, precision built, engineered, pre-fitted units with a minimum thirty (30) years' experience in the sale of folding- sliding door systems for large openings in the North American market.
   1. Manufacturer to have ISO 9001: 2015 quality management system registration.
   2. Manufacturer to have ISO 14001: 2015 environmental management system registration.

B. Installer Qualifications: Installer experienced in the installation of manufacturer's products or other similar products for large openings. Installer to provide reference list of at least three (3) projects of similar scale and complexity successfully completed in the last three (3) years.
   1. Installer to be trained and certified by manufacturer.

C. Single Source Responsibility: Furnish Folding Glass Storefront system materials from one manufacturer for entire Project.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's instructions and recommendations, Section 01 60 00 requirements, and as follows:

1. Deliver materials to job site in sealed, unopened cartons or crates.
   a. Upon receipt, inspect the shipment to ensure it is complete, in good condition and meets project requirements.
2. Store material under cover in a clean and dry location, protecting units against weather and defacement or damage from construction activities, especially to the edges of panels.

1.07 FIELD CONDITIONS

A. Field Measurements: Contractor to field verify dimensions of rough openings (R.O.) and threshold depressions to receive sill. Mark field measurements on product drawing submittal.

1.08 WARRANTY

A. Manufacturer Warranty: Provide Folding Glass Storefront system manufacturer's standard limited warranty as per manufacturer's published warranty document in force at time of purchase, subject to change, against defects in materials and workmanship.

1. Warranty Period beginning with the earliest of 120 days from Date of Delivery or Date of Substantial Completion:
   a. Rollers and Insulated Glass Seal Failure: Ten (10) years.
   b. All Other Components Except Screens: Ten (10) years.
      1). Exception: Five (5) years if NOT installed by manufacturer's specific system approved or certified trained installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product by Manufacturer: NanaWall SL45 by NANA WALL SYSTEMS, INC. (www.nanawall.com)

1. Substitution Procedures: See Section 01 20 00; Submit completed and signed:
   a. Document 00 63 25, Substitution Request Form (During Construction)

2.02 PERFORMANCE / DESIGN CRITERIA

A. Performance Criteria (Lab Tested):

1. ADA Compliant Flush Sill – Inward and Outward Opening:
   a. Air Infiltration (ASTM E283)-: 0.25 cfm/ft^2 (1.28 L/s/m^2) at a static air pressure difference of 1.6 psf (75 Pa).

2. Structural Loading (ASTM E330):
   a. Load Structure: At 1.5 times design wind pressure with no glass breakage or permanent damage to fasteners or storefront components.
   b. Design Pressure: Positive and Negative at 35 psf (1675 Pa)

3. Forced Entry (AAMA 1303.5 and AAMA CAWM 300): Meets requirements.
4. Swing Panel - Operation / Cycling Performance (AAMA 920): 500,000 cycles
5. Acoustical Performance (DIN 52210-3,4): With 40 dB glass, unit STC (Rw) of 36

    a. System STC (Rw) 35 (35) and OITC 30 with 5/16-inch (8 mm) STC 37 laminated glass

B. Design Criteria:
1. Sizes and Configurations: As indicated by the Drawings for selected number and size of panels, location of swing panels, location of track and stacking.
2. Unit Operation: Sliding and folding hardware with top and bottom tracks.
3. Panel Configuration:
    a. Straight
4. Stack Storage Configuration:
    a. Center pivot
5. Mounting Type: Top-hung
6. Panel Type: Hinged
    a. Primary swing panel of paired swing panels, looking from inside, to be on the left.
    b. Entry/Egress panel hinged to side jamb.
7. Panel Pairing Configuration: See drawings.

2.03 MATERIALS

A. Sliding-Folding Glass Storefront Description: Monumental top-hung system designed for straight runs, segmented angle changes, and center pivot. Manufacturer's standard frame and panel profiles, with head and floor tracks, side jambs and panels with dimensions as shown on Drawings.
1. Panels and Frames
    a. Panels
        1). Single lite.
        2). Rail Depth: 1-3/4 inch (45 mm)
        3). Top Rail and Stile Width: 2-1/8 inch (53 mm)
        4). Bottom Rail Width: 2-1/8 inch (53 mm)

            a). Manufacturer's standard kickplate with height indicated.
    b. Frame
        1). Matching top track and side jambs
            a). Top Track Width: 2-1/2 inch (64 mm)
            b). Top track and Side Jambs Depth: 1-3/4 inch (45 mm)

        2). Sill Type:
            a). ADA Compliant Flush sill

3). Sill Finish: Aluminum with

a). a clear anodized finish.

4). For ADA Compliance at Swing Panel: Provide gasket to cover the channel in the sill at swing panels.

2. Aluminum Extrusion: AlMgSi0.5 alloy, 6063-T5 (F-22 - European standard)

a. Thickness: 0.078 inch (2.0 mm) nominal

3. Panel and Frame Aluminum Finish

a. Anodized (AAMA 611):

1). Clear

B. Glass and Glazing:

1. Safety Glazing: In compliance with ASTM C1036, ASTM C1048, ANSI Z97.1 and CPSC 16CFR 1201.

2. Manufacturer's tempered and laminated glass lites in double insulated glazing units, dry glazed with glass stops on the inside.

a. Insulated Glass Unit (IGU) Lites:

1). Double IGU: 13/16 inch (20 mm) thick.

b. IGU Fill:

1). Air Fill

c. Glass Spacers: Manufacturer's standard

1). silver gray finish with capillary tubes

d. Glass Lite Type:

1). Standard

e. IGU Surface:

1). Clear

C. Locking Hardware and Handles:

1. Main Entry Panel(s) for Models WITH Swing Panel(s): Provide manufacturer's Standard lever handles on the inside and outside and a lockset with a lockable latch and multi-point locking with a dead bolt and rods at the top and bottom on primary panel only.

a. Rods to be concealed and not edge mounted.

b. After turn of key or thumb-turn, depression of handles withdraws latch.

c. Lifting of handles engages rods and turn of key or thumb-turn engages deadbolt and operates lock.

d. Secondary Swing Panel: Provide two-point locking with flat handles on inside only for secondary swing panel.

e. Lever Handle - Finish:

1). Brushed satin stainless steel

f. Locking:

1). Adapter for Small Format Interchangeable Core (SFIC) by others

2. Secondary Swing Panels and Pairs of Folding Panels: Provide manufacturer's Flat handles and concealed one or two-point locking hardware operated by 180º turn of handle.
    a. Face applied flush bolt locking not acceptable (except for units with paired panels).
    b. Flat Handle - Finish:
        1). Brushed satin stainless steel
3. Handle Height: 41-3/8 inch (105 cm) centered from bottom of panel or as otherwise indicated.
4. Aluminum locking rods with fiberglass reinforced polyamide end caps at the top and bottom. Rods to have a stroke of 15/16 inch (24 mm).
5. Additional profile cylinders to be keyed alike.

D. Sliding- Folding Hardware: Provide manufacturer's standard combination sliding and folding hardware with top and bottom tracks.
1. For each pair of folding panels, provide independent cardanic suspension for four (4) wheeled rollers coated with fiberglass reinforced polyamide upper running carriage and lower guide carriage.
2. Swing Panel Hinges:
    a. Zinc die cast with finish closest match to finish of frame and panels and stainless-steel security hinge pins with setscrews.
3. Adjustment: Provide 1/16 inch (1.5 mm) in width per hinge adjustments without removing panels from tracks and without needing to remove panels from tracks.

E. Fasteners: Stainless steel screws for connecting frame components.

2.04 FABRICATION

A. Extruded aluminum frame and panel profiles, corner connectors and hinges, sliding and folding hardware, locking hardware and handles, glass and glazing and weather-stripping components needed to construct a folding glass wall.
1. Each unit factory pre-assembled and shipped with all components and installation instructions.
2. Exposed work to be carefully matched to produce continuity of line and design with all joints.
3. No raw edges visible at joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examination and Acceptance of Conditions per Section 01 70 00 and as follows:
1. Carefully examine rough openings with Installer present, for compliance with requirements affecting Work performance.
    a. Examine surfaces of openings and verify dimensions; verify rough openings are level, plumb, and square with no unevenness, bowing, or bumps on the floor; and other conditions as required by the manufacturer to receive Work.
    b. Verify the structural integrity of the header for deflection with live and dead loads limited to the lesser of L/720 of the span or 1/4 inch (6 mm). Provide structural support for lateral loads, and both wind load and eccentric load when the panels are stacked open.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install Folding Glass Storefront system in accordance with the Drawings, approved submittals, manufacturer's recommendations and installation instructions, and as follows:

1. Properly flash, waterproof and seal around opening perimeter.
2. Securely attach anchorage devices to rigidly fit frame in place, level, straight, plumb and square. Install frame in proper elevation, plane and location, and in proper alignment with other work
3. When lower track is designed to drain, provide connections to allow for drainage.
4. Install panels, handles, lockset, screens and other accessories in accordance with manufacturer's recommendations and instructions.

3.03 FIELD QUALITY CONTROL

A. Inspections per Section 01 40 00 of the following:

1. Verify the Folding Glass Storefront system operates and functions properly. Adjust hardware for proper operation.

B. Non-Conforming Work: Repair or replace non-conforming work as directed by the Architect; see General and Supplementary Conditions, and Division 01, General Requirements.

3.04 CLEANING AND PROTECTION

A. Keep units closed and protect Folding Glass Storefront installation against damage from construction activities.

B. Remove protective coatings and use manufacturer recommended methods to clean exposed surfaces.

END OF SECTION

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