

SECTION 10 22 39

FOLDING GLASS PARTITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes furnishing and installing a sliding-folding thermally broken aluminum-framed glass panel system that includes:
 - 1. Aluminum frame
 - 2. Threshold
 - 3. Panels
 - 4. Sliding-folding and locking hardware
 - 5. Sound gasketing
 - 6. Glass and glazing
 - 7. 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 06 10 00, Rough Carpentry: Wood framing R.O. and blocking.
 - 3. Section 07 90 00, Joint Protection
 - 4. Section 09 22 16, Non-Structural Metal Framing: Metal framing R.O. and reinforcement.

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 611, Voluntary Specification for Anodized Architectural Aluminum
 - b. AAMA 2604, Voluntary Specifications, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
 - 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 Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
 - d. ASTM E413-16, Classification for Rating Sound Insulation
 - 4. Construction Products Directive (CPD), a legal mandate of the European Commission; http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/construction-products/index_en.htm
 - a. CE Mark; http://ec.europa.eu/growth/single-market/ce-marking/index_en.htm

5. CPSC. Consumer Product Safety Commission; www.cpsc.gov
 - a. CPSC 16CFR-1201, Safety Standard for Architectural Glazing Materials
6. DIN. "Deutsches Institut für Normung" (German institute for standardization); www.en-standard.eu/din-standards
 - a. DIN EN ISO 717-1. Acoustics – Rating of sound insulation in buildings and building elements
 - b. DIN EN ISO 10140-1, 2, 4 & 5. Airborne sound measurement
7. EN Standards - Construction Materials and Building (European Standards); www.en-standard.eu/din-standards
 - a. EN 1191, Windows and Pedestrian Doors - Mechanical Durability

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate Folding Glass Partition system and framing R.O.
- B. Pre-installation 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 Partition 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 Partition system component sizes, dimensions and framing R.O., configuration, swing panels, direction of swing, stacking layout, typical head jamb, side jambs and sill details, type of glazing material, handle height and field measurements.
- D. Certificates: Submit CE Mark certificate.
- E. Manufacturers' Instructions: Submit Owner's Manual from manufacturer which includes installation instructions, operation and maintenance data: Identify with project name, location and completion date, and type and size of unit installed.

NOTE: Delete the following Article if LEED is not applicable; edit to meet project LEED requirements.

- F. Sustainable Design Submittals (USGBC [LEED®](#)): Refer to Section 01 81 15, LEED Design Requirements.
 1. LEED 2009 (v3) Credits. Complete online LEED forms and submit other required materials as follows:
 - a. Materials and Resources (MR) Credits:
 - MR Credit 1.1 (MRc1.1): Building Reuse - Maintain Existing Exterior Walls, Floors and Roof
 - MR Credit 1.2 (MRc1.2): Building Reuse - Maintain Existing Interior Nonstructural Elements
 - MR Credit 2 (MRc2): Construction Waste Management

NOTE: MR Credit 3 below can apply to reusing salvaged Folding Glass Partition.

MR Credit 3: Materials Reuse - 5% (MRc3.1) or 10% (MRc3.2)

- a). Submit percentage of products made from plant materials with a less than 10-year harvest cycle against the total value of building materials on the project.
- b. Indoor Environmental Quality (EQ) Credits:
 - IEQ Credit 2 (IEQc2): Increased Ventilation - Case 2 - Naturally Ventilated Spaces
 - IEQ Credit 8.1 (IEQc8.1): Daylight & Views - Daylight 75% of Spaces
 - IEQ Credit 8.2 (IEQc8.2): Daylight & Views - Views for 90% of Spaces

IEQ Credit 9 (LEED for Schools - IEQc9): Enhanced Acoustical Performance

2. LEED v4 for Interior Design and Construction (ID&C) Credits. Complete online LEED forms and submit other required materials as follows:
 - a. Energy and Atmosphere (EA) Credits:
EA Credit 2 (EAc2): Optimize Energy Performance
 - b. Materials and Resources (MR) Credits:

NOTE: MR Credit 1 below can apply to reusing salvaged Folding Glass Partition.

MR Credit 1 (MRc1): Building Life-Cycle Impact Reduction; Option 3 - Building and Material Reuse

- c. Indoor Environmental Quality (EQ) Credits:
EQ Credit 7 (EQc7): Daylight
EQ Credit 8 (EQc8): Quality Views
EQ Credit 9 (EQc9): Acoustic Performance
 - a). Submit calculations or measurements for occupant spaces to meet sound transmission class ratings between adjacent spaces and reverberation time requirements within a room.

G. LEED Closeout Documentation:

NOTE: Edit below to meet project LEED requirements.

1. LEED 2009 (v3). Submit completed LEED™ submittal Worksheet Templates for the following credits:
 - a. MRc1.1, MRc1.2, MRc2, MRc3, IEQc2, IEQc8.1, IEQc8.2, IEQc9
2. LEED v4 (ID&C). Submit information and documentation to complete LEED™ Worksheet Templates for the following credits:
 - a. EAc2, MRc1, EQc7, EQc8, EQc9

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Folding Glass Partition to be CE Mark certified.

NOTE: The CE mark serves as verification that the product conforms with the essential requirements of the Construction Products Directive (CPD), a legal mandate of the European Commission. CE certified windows and doors provide building professionals with a uniform set of technical standards to evaluate and specify product performance with added assurance that NanaWall products are safe and fit for purpose.

- B. 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.
- C. 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.
- D. Single Source Responsibility: Furnish Folding Glass Partition 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 drawings submittal.

1.08 WARRANTY

- A. Manufacturer Warranty: Provide Folding Glass Partition 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 Glass Seal Failure: Ten (10) years
 - b. All Other Components: Ten (10) years

Exception: Five (5) years if NOT installed by manufacturer's certified trained installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

NANA WALL SYSTEMS, INC.
 100 Meadow Creek Drive, Corte Madera, CA 94925
 Toll Free (800) 873-5673
 Telephone: (415) 383-3148
 Fax: (415) 383-0312
 Email: info@nanawall.com

1. Substitution Procedures: See Section 01 20 00: Submit completed and signed:
 - a. Document 00 43 25, Substitution Request Form (During Procurement)
 - b. Document 00 63 25, Substitution Request Form (During Construction)

2.02 PERFORMANCE / DESIGN CRITERIA

- A. Performance Criteria:

1. Acoustic Performance

STC (Rw)

NOTE: Acoustical system STC and Rw ratings per ASTM E413 and DIN EN ISO 717-1 are from testing of full panel systems by an independent and accredited acoustical laboratory in accordance with ASTM E90-09 and DIN EN ISO 10140-1, 2, 4 & 5 test procedure. A complete and unedited written test report is available upon request.

See manufacturer's latest published data regarding performance.

- a. [System STC (Rw) 45 (45) with frame recessed and 1-7/16 inch (36 mm) double IGU, argon filled, 12 mm + 8 mm STC 48 laminated glass]
- b. [System STC (Rw) 38 (38) with 1-1/8 inch (28 mm) double IGU, argon filled, 6 mm laminated and 6 mm tempered STC 39 glass]
- c. [System STC (Rw) 33 (33) with 15/16" (24 mm) double IGU, air filled, 4 mm and 4 mm STC 31 float glass]

NOTE: Acoustical system STC (Rw) ratings below are engineer-calculated interpolations based on the full panel systems testing with the three glass options above. Calculations of system STC (Rw) from other glazing STC is available on request.

- d. [System STC (Rw) 45 (45) with frame recessed and 1-7/16 inch (36 mm) double IGU, air filled, 10 mm + 8 mm STC 48 laminated glass]
 - e. [System STC (Rw) 44 (44) with frame recessed and 1-9/16 inch (40 mm) double IGU, air filled, 8 mm + 8 mm STC 47 laminated glass]
 - f. [System STC (Rw) 40 (40) with 1-1/4 inch (32 mm) double IGU, air filled, 6 mm + 6 mm STC 42 laminated glass]
 - g. [System STC (Rw) 37 (37) with 3/8 inch (10 mm) STC 38 laminated glass]
 - h. [System STC (Rw) 36 (36) with 5/16 inch (8 mm) STC 36 laminated glass]
 - i. [System STC (Rw) 35 (35) with 1/4 inch (6 mm) STC 35 laminated glass]
- B. LEED Characteristics:
- 1. LEED 2009 (v3)
 - a. MRc1.1: *NanaWall* exterior glass wall systems, not demolished in a renovation project, are reused in the same location.
 - b. MRc1.2: *NanaWall* interior glass wall systems, not demolished in a renovation project, are reused in the same location.
 - c. MRc2: *NanaWall* cardboard shipping crates are made of 60% recycled material and are 100% recyclable.
 - d. MRc3: *NanaWall*'s components easily disassemble and reassemble to "*Use as salvaged... or reused materials.*"
 - e. IEQc2: *NanaWall* systems provide natural ventilation in the open position, assisting in the 90% required natural ventilation of occupied spaces of ASHRAE 62.1.
 - f. EQc8.1: *NanaWall* glass wall assembly borrowed light brings daylight deeper into the floor plate.
 - g. EQc8.2: *NanaWall* glass wall assemblies provide direct outdoor lines of sight.
 - h. IEQc9: (LEED for Schools): For gasketed *NanaWall* glass wall assemblies with glass units STC testing of up to 45 dB.
 - 2. LEED v4 for Interior Design and Construction (ID&C)
 - a. EAc2: *NanaWall* systems using designed double IGU and thermally/ acoustically broken frames can provide significant energy performance.
 - b. MRc1: *NanaWall* can be easily disassembled for salvage and reuse.
 - c. EQc7: *NanaWall* glass wall assembly borrowed light brings daylight deeper into the floor plate.
 - d. EQc8: *NanaWall* glass wall assemblies provide direct outdoor lines of sight.
 - e. EQc9: *NanaWall* glass wall assemblies can contribute with system acoustic ratings of up to a 45 dB reduction.
- C. Design Criteria:
- 1. Sizes and Configurations: As indicated by the Drawings for selected number and size of panels, location of swing and folding panels.
 - 2. Unit Operation: Sliding and folding hardware with top and bottom tracks;
 - a. [Inswing type and stack storage inside jamb]
 - b. [Outswing type and stack storage outside jamb]

3. Panel Configuration: Straight.
 - a. Mounting Type: Floor track supported with upper guide track.
4. Sill Type: Surface Mounted Minimal ADA Sill
5. Panel Type: Hinged
 - a. [With Entry/Egress panel hinged to side jamb.]
 - b. [Without Entry/Egress panel hinged to side jamb]
6. Panel Pairing Configuration: See drawings.
 - a. [Bi-folding panels hinged to side jamb]
 - b. [Bi-folding panels unhinged pairs]

NOTE: Sizes and Configurations: http://www.nanawall.com/products/acoustifold_options.
 See manufacturer drawings for selected custom dimensions within maximum frame sizes possible as indicated in manufacturer's literature. Maximum sizes possible are based on weight of glazing selected.
 See drawings for selected number of panels and configuration.

2.03 MATERIALS

- A. Thermally Broken Aluminum Framed Folding Glass Storefront Description: nominal frame stile width of 3-7/8 inch (99 mm) between folding panels, floor track supported system. Manufacturer's standard thermally broken frame and panel profiles, with head track, side jambs, sill and panels with dimensions as shown on Drawings.

1. Panels and frame:
 - a. Panels:
Single lite.

NOTE: Single lite above is standard; other options below may require an upcharge.
 Refer to manufacturer's size chart for glass panel sizes requiring the use of horizontal mullions.

[Multiple lites with horizontal mullion(s) at height(s) indicated from the bottom of the panel.]

[Single lite with simulated divided lites in pattern as shown on Drawings.]

Panel Size (W x H): As indicated.

NOTE: Maximum unit heights are dependent on the weight of glazing

Frame Depth:	2-15/16 inch (74 mm)
Head Track Width:	2-13/16 inch (72 mm) or 3-7/8 inch (99 mm) for paired panel configurations
Side Jamb Width:	2 inches (51 mm)

NOTE: 1-3/4 x 2 + 3/8 inch gasket = 3-7/8 inch (45 x 2 + 9 = 99 mm) vertical rail profile.

Panel Depth:	2-5/8 inch (67 mm)
Vertical Stile Width:	1-3/4 inch (45 mm) to 4-3/16 inch (107 mm) with extension profile
Bottom Rail Width:	
a.	[2-5/8 (67 mm)]
b.	[Manufacturer's standard kick-plate of 10" (254 mm)]

- b. Frame:

Matching thermally broken top track and side jambs with covers to hide anchoring connections. Provide side jambs capable of adjustment of +/- 3/16" (5 mm).

Sill Type: Surface Mounted Minimal ADA Sill

- a). Finish: Aluminum with [Clear anodized finish.]
[Dark bronze anodized finish.]
2. Aluminum Extrusion: AlMgSi0.5 alloy, 6063-T5 (F-22 – European standard)
 - a. Thickness: 0.078 inch (2.0 mm) nominal
 - b. Acoustic Break: 1-1/4" (32 mm) wide specially designed glass fiber reinforced (GFR) polyamide "Bionic Turtle".
3. Aluminum Finish:
 - a. Inside and Outside;
[Same (one-color)]
[Different (two-tone)]

NOTE: Select finish type below, edit to requirements and delete items not used.

- b. Anodized (AAMA 611):
[Clear]
[Dark Bronze]
- c. Powder Coat (AAMA 2604):
Color as chosen from manufacturer's powder coating finish chart from
 - a). [Manufacturer's standard selection of 50 colors - matte.]
 - b). [Manufacturer's full RAL selection.]
 - i.[High Gloss]
 - ii.[Matte]
 - b). [Custom finish.]

B. Glass and Glazing:

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

NOTE: Unlike wet glazing, NanaWall's standard dry glazing method helps reduce instances of seal failure.

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

NOTE: Select and edit glass type(s) to meet building code, acoustic, security, translucency and other project requirements with other glass available from manufacturer.

Custom layouts with horizontal mullions, simulated divided lites, inserts, and high bottom rails are possible.

Contact NanaWall for availability of other commercial glass types.

- a. Insulated Glass Unit (IGU) Lites: Select between 13/16" (20 mm) and 1-3/4" (45 mm)
- b. IGU Fill: Air filled
- c. Glass Spacers: Manufacturer's standard [gray] [dark bronze] finish;
- d. Single Glass: Select between 1/4" (6 mm) and 3/4" (19 mm)
- e. Glass Lite Type: < insert glass type >
Standard reduced iron

NOTE: Item below requires an upcharge.

[Low iron]

C. Locking Hardware and Handles:

NOTE: Select one of the below Main Entry Panel paragraphs WITH or WITHOUT Swing Panels, deleting all others. Edit to suit project requirements.

1. Main Entry Panel with a Swing Panel: Provide manufacturer's standard lever handles on the inside and outside, a lockset with lockable latch, multi-point locking with a dead bolt and rods at the top and bottom on primary panel only.
 - a. After turn of key or thumb turn, depression of handles withdraws latch.
 - b. Lifting of handles engages rods and turn of key or thumb turn engages deadbolt and operates lock.
 - c. Lever Handle - Finish:
Brushed satin stainless steel
[Black titanium stainless steel]

NOTE: Handles above are standard; options below may require an upcharge.
ADA lever handle with return only available in "Brushed satin stainless steel."

- [Oil rubbed bronze solid brass.]
 - [Satin nickel solid brass.]
 - [White solid brass.]
 - d. Locking:
Standard profile cylinder. Additional profile cylinders to be [keyed alike.] [keyed differently.]
Adapter for Small Format Interchangeable Core (SFIC)
2. Main Entry Panel: Provide manufacturer's standard flat handle on inside only with concealed two-point locking hardware operated by 180° turn of handle.

NOTE: With the option above, the main entry panel is operable from inside only and that there is no latch.
Other compatible lever handle styles and finishes are available from other suppliers.

3. Main Entry Panel for Models WITH a Swing Panel: No hardware or locking provided by manufacturer; Field installed panic device by Section 08 71 00.
4. Pairs of Folding Panels: Provide manufacturer's [flat handles] [removable custodial handles] and concealed two-point locking hardware operated by 180° turn of handle between each pair. Face applied Surface Mounted Minimal bolt locking NOT acceptable.
 - a. Flat Handle - Finish:
[Brushed satin stainless steel]
[Black titanium stainless steel]
5. Handle Height: 41-3/8 inch (105 cm) centered from bottom of panel or as otherwise indicated.
6. Locking rods with standard end caps at the top and bottom. Rods to have a stroke of 15/16 inch (24 mm).
- D. Sliding-Folding Hardware: Provide manufacturer's standard combination sliding and folding hardware with top and bottom tracks and threshold. All running carriages to be with sealed, self-lubricating, double ball bearing multi-rollers. Surface mounted hinges and running carriages NOT acceptable.

NOTE: Weight of panels borne by the bottom of the guide channel in the sill is NOT acceptable.

1. Lower Running Carriage Carrying Capacity: 250 lb. (120 kg). Lower running carriage provided with two vertical stainless steel wheels and two horizontal polyamide wheels.
2. Vertical wheels with Gothic arch feature to ride on top of stainless steel guide track covers over the full length of the sill track. Wheels riding on aluminum surfaces NOT acceptable.

3. Upper guide carriage with two horizontal polyamide guiding wheels. For configurations with pairs of panels that can slide left or right, additional concealed, additional vertical tilt protection hardware.
 4. Hinges: [Clear] [Dark bronze] anodized aluminum with stainless steel security hinge pins and set-screws. Additional butterfly guides between panels for a tight seal.
- E. Sound Gasketing: Manufacturer's double layer EPDM between panels and EPDM gasket, Q-Ion gasket, or brush seal between panel and frame, or brush seals with a two-layer fiberglass reinforced polyamide fin attached at both inner and outer edge of bottom of door panels with a recessed sill or on frame for sealing between panels and between panel and frame.

NOTE: The manufacturer's sound gasketing is determined at the factory by the direction of swing, the panel configuration, and the type of locking.

- F. Fasteners: Tapered pins or stainless steel screws for connecting frame components.

2.04 FABRICATION

- A. Folding Glass Wall: Extruded aluminum frame and panel profiles, corner connectors and hinges, sliding and folding hardware, locking hardware and handles, glass and glazing and sound gasketing.
1. Each unit factory pre-assembled and shipped with complete system 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.

2.05 ACCESSORIES

- A. Provide sidelights, transoms, corner posts, or single or double doors as indicated.

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 for readiness to receive Work.
 - b. Verify 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.

NOTE: Prior to installing NanaWall, it is recommended that all building dead loads be applied to the header. Allow a reasonable amount of time for the dead load's effect on the header; only then can the building's live load be used to meet the above requirements of $L/720$ or 1/4 inch (6 mm). If this is not done, both dead and live loads need to be considered.

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

3.02 INSTALLATION

- A. General: Install Folding Glass Partition system in accordance with the Drawings, approved submittals, manufacturer's recommendations and installation instructions, and as follows:
1. Properly 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. Install panels, handles, lockset, gasketing and other accessories in accordance with

manufacturer's recommendations and instructions.

3.03 FIELD QUALITY CONTROL

- A. Field Tests and Inspections per Section 01 40 00 of the following:
 - 1. Verify the Folding Glass Partition 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 Partition installation against damage from construction activities.
- B. Remove protective coatings and use manufacturer recommended methods to clean exposed surfaces.

END OF SECTION

DISCLAIMER:

Nana Wall Systems, Inc. takes no responsibility for product selection or application, including, but not limited to, compliance with building codes, safety codes, laws, or fitness for a particular purpose. This guide specification is not intended to be verbatim as a project specification without appropriate modifications for the specific use intended and the particular requirements of a specific construction project.

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