

SECTION 08 35 13
FOLDING GLASS DOORS

SECTION 08 43 33
FOLDING GLASS STOREFRONT

NOTE: Modify footers to align when using this section name and number.

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes furnishing and installing a floor track supported, 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. 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 06 10 00, Rough Carpentry: Wood framing R.O. and blocking.
 - 3. Section 06 20 00, Finish Carpentry. Section 07 27 00, Air Barriers: Building paper and building wrap.
 - 5. Section 07 62 00, Sheet Metal Flashing and Trim: Flashing gutters, and other sheet metal work.
 - 6. Section 07 90 00, Joint Protection.
 - 7. Section 08 42 23, Glass Entrance Swing Doors.
 - 8. Section 08 51 13, Aluminum Windows: NanaWall SL88, tilt-turn, casement window.
 - 9. Section 09 22 16, Non-Structural Metal Framing: Metal framing R.O. and reinforcement.
 - 10. Section 10 22 39, Folding Glass Partitions: NanaWall SL70.

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 520, Voluntary Specification for Rating the Severe Wind-Driven Rain Resistance of Windows, Doors, and Unit Skylights.
 - c. AAMA 611, Voluntary Specification for Anodized Architectural Aluminum.
 - d. AAMA 920, Operation / Cycling Performance.
 - e. AAMA 1304, Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.
 - f. AAMA 2604, Voluntary Specifications, Performance Requirements, and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - g. AAMA 2605, Voluntary Specifications, Performance Requirements, and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
 - h. AAMA/WDMA/CSA 101/I.S.2/A440, NAFS, North American Fenestration Standard - Specification for Windows, Doors, and Skylights.
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.
 - j. ASTM E2268, Standard Test Method for Water Penetration of Exterior Windows, Skylights, and Doors by Rapid Pulsed Air Pressure Difference.
 - k. ASTM F842, Standard Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies.
4. CPSC. Consumer Product Safety Commission; www.cpsc.gov
- a. CPSC 16CFR-1201, Safety Standard for Architectural Glazing Materials
5. CSA Group (Canadian Standards Association); www.csagroup.org/global/en/home
- a. CSA A440S1 - The Canadian supplement to North American (NAFS) standards
6. DIN. "Deutsches Institut für Normung" (German institute for standardization); www.en-standard.eu/din-standards
- a. DIN EN 1191, Windows and doors – Resistance to repeated opening and closing – Test method; German version EN 1191: 2000.
 - b. DIN EN ISO 717-1, Acoustics – Rating of sound insulation in buildings and building elements.

- c. DIN EN ISO 9001, 2015 quality management system registration.
- d. DIN EN ISO 10140-1, 2, 4 & 5, Airborne sound measurement.
- e. DIN EN ISO 12400, Window and pedestrian doors- Mechanical durability – Requirements and classification.
- f. DIN EN ISO 14001, 2015 environmental management system registration.
- g. DIN 52210-3, Testing of acoustics in buildings - Airborne and impact sound insulation - Laboratory measurements of sound insulation of building elements and field measurements between rooms.
- h. DIN 52210-4, Tests in Building Acoustics - Airborne and Impact Sound.
- 7. Energy Star, U.S. Environmental Protection Agency (EPA) Program; www.energystar.gov
- 8. FL. Florida Building Commission – Product Approval; https://floridabuilding.org/pr/pr_app_srch.aspx
- 9. HPD. Health Product Declaration v2.3; <https://www.hpd-collaborative.org/>
- 10. NFRC. National Fenestration Rating Council; www.nfrc.org
 - a. NFRC 100, Procedure for Determining Fenestration Product U-factors
 - b. NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
 - c. NFRC 400, Procedure for Determining Fenestration Product Air Leakage
 - d. NFRC 500, Procedure for Determining Fenestration Product Condensation Resistance Rating Values

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate Folding Glass Storefront 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 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, stacking layout, typical head jamb, side jambs and sill details, type of glazing material, handle height, and field measurements.
- 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.

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

- E. Sustainable Design Submittals (USGBC [LEED®](https://www.usgbc.org/)): 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. Energy and Atmosphere (EA) Credits:
 - 1). EA Credit 1 (EAc1): Optimize Energy Performance.
 - b. Materials and Resources (MR) Credits:
 - 1). MR Credit 1.1 (MRc1.1): Building Reuse - Maintain Existing Exterior Walls, Floors and Roof.
 - 2). MR Credit 1.2 (MRc1.2): Building Reuse - Maintain Existing Interior Nonstructural Elements.

- 3). MR Credit 2 (MRc2): Construction Waste Management.

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

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

NOTE: MR Credit 5 below can apply to projects within 500 miles (805 km) of the NanaWall fabrication shop located in Richmond, CA 94801.

- 5). MR Credit 5: Regional Materials: 10% (MRc5.1) or 20% (MRc5.2) Extracted, Processed & Manufactured Regionally.

- 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.

- c. Indoor Environmental Quality (EQ) Credits:

- 1). IEQ Credit 2 (IEQc2): Increased Ventilation - Case 2 - Naturally Ventilated Spaces.
- 2). IEQ Credit 8.1 (IEQc8.1): Daylight & Views - Daylight 75% of Spaces.
- 3). IEQ Credit 8.2 (IEQc8.2): Daylight & Views - Views for 90% of Spaces.
- 4). IEQ Credit 9 (LEED for Schools - IEQc9): Enhanced Acoustical Performance.

2. **LEED v4 for Building Design and Construction (BD&C) Credits.** Complete online LEED forms and submit other required materials as follows:

- a. Energy and Atmosphere (EA) Credits:

- 1). 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 Storefront.

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

- c. Indoor Environmental Quality (EQ) Credits:

- 1). EQ Credit 7 (EQc7): Daylight
- 2). EQ Credit 8 (EQc8): Quality Views
- 3). 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.

F. 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. EAc1, MRc1.1, MRc1.2, MRc2, MRc3, MRc5, MRc6, IEQc2, IEQc8.1, IEQc8.2, IEQc9

2. **LEED v4 (BD&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. Manufacturer Qualifications: Manufacturer capable of providing complete, precision built, engineered, pre-fitted units with a thirty five plus (35) years' experience in the sale of folding-sliding door systems for large openings in the North American market.

- 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 cove

- 3. r 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 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 SL70** 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

NOTE: Select one of the six Performance Criteria paragraphs below for different Sill and Opening types, deleting paragraphs not chosen. Select the Higher Weather Performance Raised Sill, Low Profile Saddle Sill, or Flush Sill, and an Inward or Outward Opening.

NOTE: Edit for weeps. Weeps, when provided, are to be drilled in the field by the installer to manufacturer's requirements.

Air infiltration and water penetration testing results are only applicable if the unit matches the tested panel and unit size, direction of opening, and type of sill.

Structural load testing results are only applicable for the test unit size and type of locking and rods.

Comparative analysis charts published by the manufacturer shows which panel sizes, if any, meets the structural loading design pressures specifically required for the project. Check for limitations on the use of these charts in the jurisdiction of the project.

Forced entry testing results are only applicable for the test unit type of locking.

See manufacturer's latest published data regarding performance.

It is expected that the installed system's performance would be not more than 2/3rd of the following certified laboratory test data in accordance with AAMA 502.

A. Performance Criteria (Lab Tested): Higher Weather Performance Raised Sill - Inward Opening

1. Air Infiltration (ASTM E-283):

- a. 0.16 cfm/ft² (0.81 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
- b. 0.20 cfm/ft² (1.02 L/s/m²) at a static air pressure difference of 6.24 psf (300 Pa)

2. Water Penetration (ASTM E-331, ASTM E-547):

- a. No uncontrolled water leakage at a static test pressure of 9 psf (440 Pa)

3. Dynamic Water Penetration (AAMA 520 / ASTM E-2268):

- a. Performance Level 2 at 6 - 18 psf (300 - 860 Pa)

4. Structural Load Deflection (TAS 202 / ASTM E-330):

- a. Windload Resistance: Pass
 - 1). Design Pressure Positive: 70 psf (3350 Pa); C4
 - 2). Design Pressure Negative: 100 psf (4785 Pa); C3

B. Performance Criteria (Lab Tested): Higher Weather Performance Raised Sill - Outward Opening

1. Air Infiltration (ASTM E-283):

- a. 0.02 cfm/ft² (0.10 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
- b. 0.08 cfm/ft² (0.41 L/s/m²) at a static air pressure difference of 6.24 psf (300 Pa)

2. Water Penetration (ASTM E-331, ASTM E-547):

- a. No uncontrolled water leakage at a static test pressure of 9 psf (440 Pa)

3. Dynamic Water Penetration (AAMA 520 / ASTM E-2268):

- a. Performance Level 1 at 5 - 15 psf (250 - 715 Pa)

4. Structural Load Deflection (TAS 202 / ASTM E-330):

- a. Windload Resistance: Pass
 - 1). Design Pressure Positive: 70 psf (3350 Pa); C3
 - 2). Design Pressure Negative: 70 psf (3350 Pa); C4

- C. Performance Criteria (Lab Tested): **Low Profile Saddle Sill - Inward Opening**
1. Air Infiltration (ASTM E-283):
 - a. 0.15 cfm/ft² (0.76 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.29 cfm/ft² (1.47 L/s/m²) at a static air pressure difference of 6.24 psf (300 Pa)
 2. Water Penetration (ASTM E-331, ASTM E-547):
 - a. No uncontrolled water leakage at a static (with weeps) test pressure of 5.25 psf (250 Pa)
 3. Structural Loading (ASTM E-330):
 - a. Windload Resistance: Pass; C4
 - 1). Design Pressure Positive: 70 psf (3350 Pa)
 - 2). Design Pressure Negative: 70 psf (3350 Pa)
- D. Performance Criteria (Lab Tested): **Low Profile Saddle Sill - Outward Opening**
1. Air Infiltration (ASTM E-283):
 - a. 0.14 cfm/ft² (0.71 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.30 cfm/ft² (1.52 L/s/m²) at a static air pressure difference of 6.24 psf (300 Pa)
 2. Water Penetration (ASTM E-331, ASTM E-547):
 - a. No uncontrolled water leakage at a static (with weeps) test pressure of 6.00 psf (300 Pa)
 3. Structural Loading (ASTM E-330):
 - a. Windload Resistance: Pass; C4
 - 1). Design Pressure Positive: 70 psf (3350 Pa)
 - 2). Design Pressure Negative: 70 psf (3350 Pa)
- E. Performance Criteria (Lab Tested): **Standard Flush Sill - Inward Opening**
1. Air Infiltration (ASTM E-283):
 - a. 0.15 cfm/ft² (0.76 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.29 cfm/ft² (1.47 L/s/m²) at a static air pressure difference of 6.24 psf (300 Pa)
 2. Structural Loading (ASTM E-330):
 - a. Windload Resistance: Pass; C4
 - 1). Design Pressure Positive: 70 psf (3350 Pa)
 - 2). Design Pressure Negative: 70 psf (3350 Pa)
- F. Performance Criteria (Lab Tested): **Standard Flush Sill - Outward Opening**
1. Air Infiltration (ASTM E-283):
 - a. 0.14 cfm/ft² (0.71 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.30 cfm/ft² (1.52 L/s/m²) at a static air pressure difference of 6.24 psf (300 Pa)
 2. Structural Loading (ASTM E-330):
 - a. Windload Resistance: Pass; C4
 - 1). Design Pressure Positive: 70 psf (3350 Pa)
 - 2). Design Pressure Negative: 70 psf (3350 Pa)
- G. Items below are common to all sill types, except as noted.
1. Operation / Cycling Performance - Swing Panel (AAMA 920): 500,000 cycles
 2. Life Cycle Performance - System (DIN EN 1191/12400): 20,000 cycles
 3. Folding Glass Storefront Units tested to AAMA/WDMA/CSA 101/I.S.2/A440.

NOTE: For storefront units requiring acoustic performance keep the following. Edit to suit project conditions.

4. Glass Acoustical Performance (DIN 52210-3, 4):

STC (Rw)

NOTE: Acoustical system STC and Rw ratings per ASTM E-413 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) 43 (43) and OITC 35 with 1-1/2 inch (38 mm) double IGU, 10 mm and 8 mm STC 48 laminated glass]
- b. [System STC (Rw) 41 (41) and OITC 33 with 1-7/16 inch (36 mm) double IGU, 8 mm laminated and 6 mm tempered STC 43 glass]
- c. [System STC (Rw) 33 (33) and OITC 27 with 15/16 inch (24 mm) double IGU, 4 mm and 4 mm STC 32 tempered glass]

NOTE: Acoustical system STC ratings below are engineer-calculated conversions of European tests per ASTM E-413 and ASTM E-1332 for the full panel system with the flush sill.

- d. [System STC (Rw) 42 (42) with 1-5/16 inch (34 mm) double IGU, 6 mm and 6 mm STC 44 enhanced laminated glass]
- e. [System STC (Rw) 38 (38) with 1/2 inch (12 mm) STC 39 enhanced laminated glass]
- f. [System STC (Rw) 36 (36) with 1/4 inch (6 mm) STC 36 enhanced laminated glass]
- g. [System STC (Rw) 35 (35) with 1/4 inch (6 mm) STC 35 laminated glass]
- h. [System STC (Rw) 32 (32) with 1/4 inch (6 mm) STC 31 tempered glass]

NOTE: Retain Florida Product Approval subparagraph below when needed to meet wind loading requirements.

- 5. Florida Product Approval Units with panel sizes up to 3' 2-7/8" (94 cm) wide x 9' 8-3/4" (292 cm) high) subject to manufacturer size chart: FL 35025

NOTE: FL 35025 web-link is:

https://www.floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDqtW2pk%2fDHN%2ftFHFoneAOCxFfOtVMIGq3gdyNEQjBsRtsA%3d%3d

- 6. Forced Entry (AAMA 1304 / ATSM F842): Meets requirements for +F1
- 7. Thermal Performance (U-factor): NFRC 100 rated, certified, and labeled
- 8. Solar Heat Gain Coefficient (SHGC) + Visible Light Transmission (VT): NFRC 200 rated, certified, and labeled
- 9. Air Leakage: NFRC 400 rated, certified, and labeled
- 10. Condensation Resistance Factor (CRF): NFRC 500 rated, certified, and labeled

NOTE: The NFRC 100, 200, 400, and 500 ratings of the SL70 Folding Glass Storefront System meet **Prescriptive Method** requirements for U-factor, SHGC, Air Leakage, and CRF of *California Title 24, Chapter 3, Building Envelope Requirements*.

For the listing of Nana Wall product NFRC testing reports go to the following website <http://search.nfrc.org/search/searchdefault.aspx>; click on **Door** (Find Ratings for Door Products); click on the **Search by Manufacturer** button; click **Manufacturers**, scroll down to and click on **Nana Wall Systems, Inc.**, and click on the **Find Products** button.

11. EPA Energy Star:

Meets requirements with specific glass

NOTE: **Energy Star** values for DOORS with > 50% glass can be achieved through the use of specific glass units meeting the following requirements:

Northern & North-Central Region: ≤ 0.30 U-factor 0.40 SHGC

South-Central & Southern Region: ≤ 0.30 U-factor 0.25 SHGC

Energy Star Air Leakage Rating Requirements (ASTM E283 in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440-11):

Swinging Door: ≤ 0.5 cfm/ft² (2.56 L/s/m²)

For guidance only as Nana Wall Systems is not a participant of the Energy Star Program.

12. Health Product Declaration (HPD):

Meets requirements

NOTE: Health Product Declaration (HPD) in accordance with HPD Standard v2.3 tested with threshold level of hazards from substances present at or above 1000 parts per million (ppm). No residual or impurities were present above the threshold level from the system components.

No VOC emission as per LEED requirements. Contact NanaWall for more information.

H. LEED Characteristics:

1. **LEED 2009** (v3)

- a. EAc1: *NanaWall* systems using low U-Value designed double or triple IGU and thermally broken frames can provide significant energy performance.
- b. MRc1.1: *NanaWall* exterior glass wall systems, not demolished in a renovation project, are reused in the same location.
- c. MRc1.2: *NanaWall* interior glass wall systems, not demolished in a renovation project, are reused in the same location.
- d. MRc2: *NanaWall* cardboard shipping crates are made of 60% recycled material and are 100% recyclable.
- e. MRc3: *NanaWall*'s components easily disassemble and reassemble to "Use as salvaged... or reused materials."
- f. MRc5: *NanaWall* glazing, panel, track, and door manufacturing final assembly plant is located in Richmond, CA 94801.
- g. IEQc2: *NanaWall* systems provide natural ventilation in the open position, assisting in the 90% required natural ventilation of occupied spaces of ASHRAE 62.1.
- h. EQc8.1: *NanaWall* glass wall assembly borrowed light brings daylight deeper into the floor plate.
- i. EQc8.2: *NanaWall* glass wall assemblies provide direct outdoor lines of sight.

2. **LEED v4 for Building Design and Construction** (BD&C)

- a. EAc2: *NanaWall* systems using low U-Value designed double or triple 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.

I. Design Criteria:

- 1. Sizes and Configurations: As indicated by the Drawings for selected number and size of panels, location of swing panels, and location of track and stacking.
- 2. Unit Operation: Sliding and folding hardware with top and bottom tracks.

3. Panel Configuration:
 - a. [Straight]
 - b. [Segmented curve]
 - c. [90° angle open corner]
 - d. [135° angle turn]
 - e. [Window door combination]
4. Stack Storage Configuration:
 - a. [Inswing]
 - b. [Outswing]
5. Mounting Type: Floor track supported
6. Panel Type: Hinged
 - a. Primary swing panel of paired swing panels, looking from inside, to be on the [**left**] [**right**].
 - b. [Entry/Egress panel hinged to side jamb.]
7. Panel Pairing Configuration: See drawings.

NOTE: Sizes and Configurations: <https://www.nanawall.com/resources/sl70/cad/standard>
 See manufacturer drawings for selected custom dimensions within maximum frame sizes possible as indicated in manufacturer's literature.
 See drawings for selected number of panels and configuration.

2.03 MATERIALS

- A. Monumental Thermally Broken Aluminum Framed Folding Glass Storefront Description: Floor track supported system designed for angle changes, segmented curves. Manufacturer's standard or post reinforced frame and panel profiles, with top track, side jambs and panels with dimensions as shown on Drawings.

1. Panels and Frames

- a. Panels
 - 1). 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.

- 2). [Multiple lites with horizontal mullion(s) at height(s) indicated from the bottom of the of the panel.]
- 3). [Single lite with simulated divided lites in pattern as shown on Drawings.]
- 4). Panel Size (W x H): As indicated.

NOTE: Maximum panel sizes are 3' 3" x 10' 2" (1 x 3.10 m) and 3' 0" x 12' 0" (0.925 x 3.65 m) with 2' 3" (0.7 m) the minimum panel width.

- 5). Rail Depth: 2-3/4 inch (70 mm)
- 6). Top Rail and Stile Width: 2-1/4 inch (57 mm)
- 7). Bottom Rail Width:
 - a). 2-1/4 inch (57 mm)

NOTE: Width above is standard; other options below may require an upcharge.
 Indicate kickplate height. Select height between 6 and 12 inches (152 and 305 mm) high.

b). [Manufacturer's standard kickplate with height indicated.]

b. Frame:

1). Matching top track and side jambs

a). Top Track and Side Jambs Width: 2-9/16 inch (65 mm)

b). Top Track and Side Jambs Depth: 3-1/8 inch (80 mm)

NOTE: Select from the following Threshold Finish types, edit to suit, and delete those not meeting project requirements. Low Profile Saddle Sill with UniverSILL® is available for outswing application only.

2). Sill Type:

a). [Higher weather performance raised sill (thermally broken)]

b). [Low profile saddle sill (thermally broken)]

c). [Low profile saddle sill with UniverSILL (thermally broken)]

d). [Flush sill (thermally broken)]

e). [Surface mounted interior sill (not thermally broken) for interior application]

3). Sill Finish: Aluminum with

a). [a clear anodized finish.]

b). [a dark bronze anodized finish.]

c). [finished to match panel only with higher weather performance sill.]

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

2. Aluminum Extrusion: AIMgSi0.5 alloy, 6063-T5 (F-22 - European standard)

a. Thickness: 0.078 inch (2.0 mm) nominal

b. Thermal Break: 3/4 to 15/16 inch (20 to 24 mm) wide polyamide plastic reinforced with glass fibers. Thinner or poured and de-bridged type thermal breaks not acceptable.

3. Panel and Frame Aluminum Finish: Inside and Outside;

a. [Same (one-color)]

b. [Different (two-tone)]

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

c. Anodized (AAMA 611):

1). [Clear]

2). [Dark Bronze]

d. Powder Coat (AAMA 2604):

1). 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 - high gloss.]

c). [Custom finish.]

e. PVDF Coat (AAMA 2605): Fluoropolymer Kynar with color to match custom finish.

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 [**single**] [**double**] [**triple**] insulated glazing units, dry glazed with glass stops on the inside.

NOTE: Select and edit glass type(s) to meet building code, wind load design, acoustic, bullet resistant and/or security, 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 the availability of other commercial glass types.

a. Glass Lite / Insulated Glass Unit (IGU):

1). Single:

- a) [1/2 inch (12 mm) STC 39 enhanced laminated glass to achieve unit STC of 38.]
- b) [1/4 inch (6 mm) STC 36 enhanced laminated glass to achieve unit STC of 36.]
- c) [1/4 inch (6 mm) STC 35 laminated glass to achieve unit STC of 35.]
- d) [1/4 inch (6 mm) STC 31 tempered glass to achieve unit STC of 32.]

2). Double IGU:

- a) [1-5/16 inch (34 mm), 6 mm + 6 mm STC 44 enhanced laminated glass to achieve unit STC of 42.]

3). Triple IGU: [1-1/2 inch (38 mm) thick.]

b. IGU Fill:

- 1). [Air filled]
- 2). [Argon filled]

c. Glass Lite Type:

- 1). Standard (Light Transmission (LT) 89%)

NOTE: Items below are options and may require an upcharge.

- 2). [Low iron (Light Transmission (LT) 91%)]
- 3). [Solar bronze]
- 4). [Solar gray]
- 5). [Bird safe]

d. Glass Spacers: Manufacturer's standard

- 1). [silver gray finish with capillary tubes]
- 2). [black finish with capillary tubes]
- 3). [silver gray finish without capillary tubes]
- 4). [black finish without capillary tubes]

e. IGU Surface:

- 1). Clear
- 2). [Low-E coating on # 2 surface of double IGU]
- 3). [Low-E coating on # 2 and # 4 surface of double IGU]
- 4). [Low-E coating on # 2 and # 5 surface of triple IGU]

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(s) for Models WITH a [**Pair of**] Swing Panel(s): Provide manufacturer's [**Standard lever handles**] or [**Lever handles with return**] 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**].

NOTE: Locking is independently tested for acoustics, structural, air, water, and forced entry.

- a. Locking:
 - 1). Standard European profile cylinder
 - 2). [Adapter accommodating a 5-7 pin Small Format Interchangeable Core (SFIC) (SFIC core supplied by others)]
- b. Rods to be concealed and not edge mounted.
- c. After turn of key or thumb-turn, depression of handles withdraws latch.
- d. Lifting of handles engages rods and turn of key or thumb turn engages deadbolt and operates lock.
- e. [Secondary Swing Panel: Provide matching dummy lever handles on both sides and concealed flush bolts that operate the rods at the top and the bottom for the secondary swing panel.]

NOTE: Secondary swing panel paragraph above is standard with pairs; hardware for Secondary Panel below is an option.

- f. [Secondary Swing Panel: Provide two-point locking with U-shaped handles on inside only for the secondary swing panel.]
- g. Lever Handle - Finish:
 - 1). Brushed satin stainless-steel
 - 2). [Titanium black stainless-steel]

NOTE: Handles above are standard; optional handle types below may require an upcharge.

Lever handle with return only available in "Brushed satin stainless-steel."

Other compatible lever, L-shaped, and push-pull handle styles and finishes are available from other suppliers.

- 3). [Oil rubbed bronze solid brass.]
- 4). [Satin nickel solid brass.]
- 5). [White solid brass.]
2. Main Entry Panel for Models WITH a [**Pair of**] Swing Panel(s): Provide lever handles on the inside and outside with single action, emergency egress, interconnected lock.
3. Main Entry Panel(s) for Models WITH a [**Pair of**] Swing Panel: Provide manufacturer's single-point single motion locking operated by GU Rondo lever handles for interior application only.
 - a. Locking:
 - 1). Standard European profile cylinder
 - 2). [Adapter accommodating a 5-7 pin Small Format Interchangeable Core (SFIC) (SFIC core supplied by others)]
4. Main Entry Panel for Models WITH a Swing Panel: Provide manufacturer's push/pull handles on both sides with dead bolt and separate lock set with key operation.

NOTE: This option is recommended with a door closer by others, but note that, when sliding the swing panel, the door closer will need to be disengaged if the swing panel is not attached to a side jamb.

- a. Locking:
 - 1). Standard European profile cylinder
 - 2). [Adapter accommodating a 5-7 pin Small Format Interchangeable Core (SFIC) (SFIC core supplied by others)]
 - b. Push-pull handles in a brushed stainless-steel finish and stainless-steel flat handles in a [**brushed satin finish.**] [**titanium black finish.**]
5. Main Entry Panel for Models WITH a [**Pair of**] Swing Panel(s): No hardware or locking provided by manufacturer; Field installed panic device(s) by Section 08 71 00 prepped for commercial application.

NOTE: Structural test load results will not apply for locking devices by others.

- a. Panic hardware (prepped, supplied, and installed by others):
 - 1). [Von Duprin 33/35A Series Narrow Stile Rim Exit Device]
6. Main Entry Pair of Panels on Models WITHOUT a Swing Panel: Provide manufacturer's standard L-shaped handles on the inside and outside, including a lock set with profile cylinder. Operation of lockset is by turn of key from outside and thumb-turn inside with two-point locking hardware operated by 180° turn of the handle.
- a. L-Shaped Handles - Finish:
 - 1). Brushed satin stainless-steel
 - 2). [Titanium black stainless-steel]

NOTE: With the option below, main entry panel is operable from inside only and there is no latch.

7. Main Entry Panel: Provide manufacturer's standard U/L-shaped handle on inside only with concealed two-point locking hardware operated by 180° turn of handle.
8. Secondary Panels and Pairs of Folding Panels: Provide manufacturer's [**Standard secondary handles**] [**Removable custodial handles**] and concealed two-point locking hardware operated by 180° turn of handle between each pair. Face applied flush bolt locking NOT acceptable.

NOTE: Locking is independently tested for structural, air, water, and forced entry.

Standard secondary handles are typical; removable custodial handles are an option that may require an upcharge.

- a. Standard Secondary Handle - Finish:
 - 1). Brushed satin stainless-steel
 - 2). [Titanium black stainless-steel]

NOTE: Handles above are standard; optional handle types below may require an upcharge.

- 3). [Brown nylon]
 - 4). [Gray nylon]
 - 5). [White nylon]
9. Handle Height: 41-3/8 inch (105 cm) centered from bottom of panel or as otherwise indicated.
10. Aluminum locking rods with standard fiberglass reinforced polyamide end caps at the top and bottom. Rods to have a stroke of 15/16 inch (24 mm).
11. Additional profile cylinders to be [**keyed alike.**] [**keyed differently.**]
- 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-lubrication, ball bearing multi-rollers. Surface mounted hinges and running carriages NOT acceptable. Weight of panels borne by the bottom of the guide channel in the sill is NOT acceptable.

1. Lower Running Carriage Carrying Capacity: 440 lbs. (200 kgs)
2. Upper guide carriage and lower running carriage provided with four vertical stainless-steel wheels and two horizontal polyamide wheels.
3. Vertical wheels to ride on top of stainless-steel guide track covers over the full length of the sill track and lie above the water run-off level.
4. Wheels riding below water run-off level and wheels riding on aluminum surfaces are NOT acceptable.
5. Swing Panel Hinges:
 - a. Zinc die cast with finish closest match to finish of frame and panels and stainless steel security hinge pins with set screws.

NOTE: Zinc die cast above is standard; stainless-steel option below has an upcharge.
 Finishes to match are closest matches available by the manufacturer. Review for acceptability.

- b. [Stainless steel hinges and security hinge pins with set screws.]
6. Adjustment: Provide folding-sliding hardware capable of compensation and adjustments without needing to remove panels from tracks, in width, 1/16 inch (1.5 mm) per hinge and in height, 5/64 inch (2 mm) up and down.
- E. Weather stripping: Manufacturer's double layer EPDM between panels, EPDM gasket and Q-lon 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 weather stripping is determined at the factory by the direction of swing, the panel configuration, the type of locking, and the type of sill.

1. UniverSILL® (Patent No. US011174673B2): For outswing low profile saddle sill, UniverSILL sill adaptor is available for additional air and water performance when needed.
 - 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 weather stripping.
 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. **Insect Screen by Others:** Fully retractable non-pleated screen made of ultra-strong, polyester / PVC mesh riding on a single track.
 1. Basis-of-Design Product by Manufacturer: **S4 Screen & Shade System by Centor.**

CENTOR NORTH AMERICA INC.

966-130 Corporate Boulevard, Aurora, IL 60502

Toll Free: (866) 255-0008

Telephone: (630) 957-1000

Fax: (630) 957-1001

Email: mail.us@centor.com

<https://centor.com/us/screens/centor-s4-insect-screen-and-shade>

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 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 requirement of 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 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. Field Tests and 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**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 requirements of a specific construction project.

www.nanawall.com