

SECTION 08 43 11

WOOD FRAMED FOLDING GLASS STOREFRONT

SECTION 08 35 13

FOLDING WOOD-FRAMED GLASS DOORS

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 sliding-folding wood framed glass panel system that includes:
 - 1. Wood frame
 - 2. Threshold
 - 3. Panels
 - 4. Sliding-folding and locking hardware
 - 5. Spines
 - 6. Weatherstripping
 - 7. Glass and glazing
 - 8. Insect screen
 - 9. 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 27 00, Air Barriers: Building wrap
 - 4. Section 07 62 00, Sheet Metal Flashing and Trim: Flashing and other sheet metal work.
 - 5. Section 07 90 00, Joint Protection
 - 6. Section 08 42 23, Glass Entrance Swing Doors
 - 7. Section 08 43 31, Wood Framed Sliding Glass Storefronts: NanaWall LS178
 - 8. Section 08 52 00, Wood Windows: NanaWall WD68, tilt-turn, casement window,
 - 9. Section 09 22 16, Non-Structural Metal Framing: Metal framing R.O. and reinforcement.
 - 10. Section 10 22 41, Wood Framed Folding Glass Partitions: NanaWall WD66
 - 11. Section 10 22 45, Wood Framed Sliding Glass Storefronts: NanaWall LS178

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 503, Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
 - b. AAMA 611, Voluntary Specification for Anodized Architectural Aluminum
 - c. AAMA 1304, Voluntary Specification for Forced Entry Resistance of Side-Hinged Door

Systems

- d. 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 E283, Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - d. ASTM E330, Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - e. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - f. ASTM E413, Classification for Rating Sound Insulation
 - g. ASTM E547, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 - h. ASTM E1332, Standard Classification for Rating Outdoor-Indoor Sound Attenuation
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. CSA Group (Canadian Standards Association); www.csagroup.org/global/en/home
 - a. CSA A440S1 - The Canadian supplement to North American (NAFS) standards
7. 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 1627, Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Requirements and classification
 - c. DIN EN 1630, Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts
 - d. DIN EN ISO 12400, Windows and pedestrian doors - Mechanical durability - Requirements and classification
 - e. DIN EN ISO 10077, Thermal Performance of Windows, Doors and Shutters
8. Energy Star, U.S. Environmental Protection Agency (EPA) Program; www.energystar.gov
9. Florida Building Commission - Product Approval; https://floridabuilding.org/pr/pr_app_srch.aspx
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. 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. Shop 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.

NOTE: Add "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor. Option is an example only.

- D. **Delegated-Design Submittal:** For structural performance of Folding Glass Storefront system, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

- D. Certificates: Submit CE Mark certificate.
- E. Manufacturers' Instructions: Submit manufacturer's installation instructions.
- F. 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.

- G. 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. Energy and Atmosphere (EA) Credits:
 - 1). EA Credit 1 (EA1): Optimize Energy Performance: System
 - 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)
- 5). MR Credit 7 (MRc7): Certified Wood
- 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

H. 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, MRc7, 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 minimum twenty-five (25) years' experience in the sale of folding-sliding door systems for large openings in the North American market.
 1. Manufacturer to have ISO 9001: 2008 quality management system registration.
 2. Manufacturer to have ISO 14001: 2005 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. Condition wood components to average prevailing relative humidity before installation. Do not subject wood components to extreme nor rapid changes in heat or humidity.
 3. Do not use forced heat to dry out building.
 4. Store flat in a well ventilated area out of direct sunlight 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 shop drawing submittal.

1.08 WARRANTY

- A. Manufacturer Warranty: Provide Folding Glass Storefront 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 certified trained installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design Product by Manufacturer: **NanaWall WD66** by **NANA WALL SYSTEMS, INC.** (www.nanawall.com)

[NANA WALL SYSTEMS, INC.](http://www.nanawall.com)
[100 Meadow Creek Drive, Corte Madera, CA 94925](http://www.nanawall.com)
[Toll Free \(800\) 873-5673](http://www.nanawall.com)
[Telephone: \(415\) 383-3148](http://www.nanawall.com)
[Fax: \(415\) 383-0312](http://www.nanawall.com)
[Email: info@nanawall.com](mailto: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), or
 - b. Document 00 63 25, Substitution Request Form (During Construction)

2.02 PERFORMANCE / DESIGN CRITERIA

NOTE: Add "Delegated-Design" Paragraph below if Contractor is required to assume responsibility for design.

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00, Quality Requirements, to design the Folding Glass Storefront system according to the following performance requirements:

1. (Insert project specific performance / design requirements here.)

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

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 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.

Check for requirements in the jurisdiction of the project.

See manufacturer's latest published data regarding performance.

It is expected that the installed system's performance would be not more than 2/3rds of the following certified laboratory test data in accordance with AAMA 503.

- A. Performance Criteria (Lab Tested): **Standard Flush Sill - Inward Opening**
1. Air Infiltration (ASTM E283): **+A3**
 - a. 0.05 cfm/ft² (0.26 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.18 cfm/ft² (0.92 L/s/m²) at 6.24 psf (300 Pa)
 2. Water Penetration for Units with Weep Holes (ASTM E547 and ASTM E331):
 - a. No uncontrolled water leakage at a static test pressure of 2.92 psf (140 Pa)
 3. Structural Load Deflection (ASTM E330): **Pass**
 - a. Design Pressure - Positive: 45 psf (2160 Pa)
 - b. Design Pressure - Negative: 55 psf (2630 Pa)
 - c. Windload Resistance: C2 rating (+/- 1500 Pa)
- B. Performance Criteria (Lab Tested): **Standard Flush Sill - Outward Opening**
1. Air Infiltration (ASTM E283): **+A3**
 - a. 0.17 cfm/ft² (0.87 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.31 cfm/ft² (1.59 L/s/m²) at 6.24 psf (300 Pa)
 2. Water Penetration for Units with Weep Holes (ASTM E547 and ASTM E331):
 - a. No uncontrolled water leakage at a static test pressure of 2.92 psf (140 Pa)
 3. Structural Load Deflection (ASTM E330): **Pass**
 - a. Design Pressure - Positive: 55 psf (2630 Pa)
 - b. Design Pressure - Negative: 45 psf (2160 Pa)
 - c. Windload Resistance: C2 rating (+/- 1500 Pa)
- C. Performance Criteria (Lab Tested): **Top Supported Low Profile Saddle Sill - Inward Opening**
1. Air Infiltration (ASTM E283): **+A3**
 - a. 0.05 cfm/ft² (0.26 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.18 cfm/ft² (0.92 L/s/m²) at 6.24 psf (300 Pa)
 2. Water Penetration for Units with 3/8 inch (9.5 mm) Weep Holes (ASTM E547 and ASTM E331):
 - a. No uncontrolled water leakage at a static test pressure of 5.43 psf (260 Pa)
 3. Structural Load Deflection (ASTM E330): **Pass**
 - a. Design Pressure - Positive: 45 psf (2160 Pa)
 - b. Design Pressure - Negative: 55 psf (2630 Pa)
 - c. Windload Resistance: C2 rating (+/- 1500 Pa)
- D. Performance Criteria (Lab Tested): **Top Supported Low Profile Saddle Sill - Outward Opening**
1. Air Infiltration (ASTM E283): **+A3**
 - a. 0.17 cfm/ft² (0.87 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.31 cfm/ft² (1.59 L/s/m²) at 6.24 psf (300 Pa)

2. Water Penetration for Units with 3/8 inch (9.5 mm) Weep Holes (ASTM E547 and ASTM E331):
 - a. No uncontrolled water leakage at a static test pressure of 5.43 psf (260 Pa)
3. Structural Load Deflection (ASTM E330): Pass
 - a. Design Pressure - Positive: 55 psf (2630 Pa)
 - b. Design Pressure - Negative: 45 psf (2160 Pa)
 - c. Windload Resistance: C2 rating (+/- 1500 Pa)
- E. Performance Criteria (Lab Tested): **Higher Weather Performance Raised Sill - Inward Opening**
 1. Air Infiltration (ASTM E283): +A3
 - a. 0.08 cfm/ft² (0.41 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.05 cfm/ft² (0.26 L/s/m²) at 6.24 psf (300 Pa)
 2. Water Penetration (ASTM E547 and ASTM E331): +B4
 - a. No uncontrolled water leakage at a static test pressure of 9 psf (440 Pa)
 3. Structural Load Deflection (ASTM E330): Pass
 - a. Design Pressure - Positive: 41.5 psf (2000 Pa)
 - b. Design Pressure - Negative: 52.5 psf (2520 Pa)
 - c. Windload Resistance: C2 rating (+/- 1500 Pa)
- F. Performance Criteria (Lab Tested): **Higher Weather Performance Raised Sill - Outward Opening**
 1. Air Infiltration (ASTM E283): +A3
 - a. 0.07 cfm/ft² (0.36 L/s/m²) at a static air pressure difference of 1.57 psf (75 Pa)
 - b. 0.18 cfm/ft² (0.92 L/s/m²) at 6.24 psf (300 Pa)
 2. Water Penetration (ASTM E547 and ASTM E331): +B4
 - a. No uncontrolled water leakage at a static test pressure of 9 psf (440 Pa)
 3. Structural Load Deflection (ASTM E330): Pass
 - a. Design Pressure - Positive: 52.5 psf (2520 Pa)
 - b. Design Pressure - Negative: 41.5 psf (2000 Pa)
 - c. Windload Resistance: C3 rating (+/- 1500 Pa)

NOTE: Items below are common to all sill types.

4. Folding Glass Storefront Units tested to AAMA/WDMA/CSA 101/I.S.2/A440.
5. System - Life Cycle Performance (DIN EN 1191/12400): Pass; 20,000 cycles
6. Forced Entry (AAMA 1304): Meets 300 lb. (1330 N) point load requirement.

NOTE: Retain Burglary Resistance subparagraph below when desired; this additional security option is available for an upcharge.

7. Unit Burglary Resistance: EN 1627-30, Class RC2/ RC2N (Resistance Class 2) certified

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

8. Florida Product Approval - Wind Loading (Reinforced Units with panel sizes up to 3'-7" inch (1.10 m) wide x 10'-0" inch (3.05 m) high) subject to manufacturer size chart: FL 18309.2

NOTE: FL 18309 web-link:
https://floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDquvosrHazGXQdunsYKQY%2fRouJ7UALsbPeSsQ1At0I8FnA%3d%3d

9. Thermal Performance (U-factor): NFRC 100 rated
10. Solar Heat Gain Coefficient (SHGC) + Visible Light Transmission (VT): NFRC 200 rated

11. Air Leakage: NFRC 400 rated
12. Condensation Resistance Factor (CRF): NFRC 500 rated

NOTE: The NFRC 100, 200, 400 and 500 ratings of the WD66 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.

13. EPA Energy Star: Meets requirements

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 values for WINDOWS can be achieved through the use of specific glass units meeting the following requirements (U-factor in accordance with NFRC 100 and SHGC in accordance with NFRC 200):

Northern Region (as of 1/1/2016): ≤ 0.27 U-factor Any SHGC

Northern Region*: ≤ 0.28 U-factor ≥ 0.32 SHGC

Northern Region*: ≤ 0.29 U-factor ≥ 0.37 SHGC

Northern Region*: ≤ 0.30 U-factor ≥ 0.42 SHGC

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

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

Southern Region: ≤ 0.40 U-factor 0.25 SHGC

* For Windows with NFRC certified U-factor and SHGC ratings that meet or exceed the listed equivalent energy performance criteria as of 1/1/2016.

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

Window, Sliding Door, or Skylight: ≤ 0.3 cfm/ft² (1.54 L/s/m²)

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

G. 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. MRc7: *NanaWall* system wood doors and doorframes can be FSC-certified.

- 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.
- j. IEQc9: (LEED for Schools) For gasketed *NanaWall* glass wall assemblies with glass unit STC testing up to a 45 dB reduction.

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 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.

H. 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 tracks and stacking bays.
- 2. Unit Operation: Adjustable sliding and folding hardware with top and bottom tracks;
 - a. [**inswing type.**]
 - b. [**outswing type.**]
- 3. Panel Configuration:
 - a. [**Straight**]
 - b. [**90° angle turn/ open corner**]
 - c. [**Window/ door combination**].
- 4. Stack Storage Configuration:
 - a. [**Inside jamb**]
 - b. [**Outside jamb**]
- 5. Mounting Type:
 - a. [**Top hung**]
 - b. [**Floor track supported**]
- 6. Paired 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: <http://www.nanawall.com/products/wd66/options>
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. Solid Wood Framed Folding Glass Storefront Description: 2-5/8 inch (66 mm) thick for double glazed and 3-1/16 inch (78 mm) thick for triple glazed frame profiles, top-hung or floor-supported

system designed for straight runs and open corners. Manufacturer's standard frame and panel profiles, with head and floor track, side jambs and panels with dimensions as shown on Drawings.

1. Panels:
 - a. Single lite.

NOTE: Single lite above is standard; other options below may require an upcharge.

- a. [**Horizontal mullion(s) at height(s) indicated from the bottom of the panel.**]
- b. [**Simulated divided lites in pattern as indicated.**]

2. Panel Size (W x H): As indicated.

NOTE: Maximum panel width for the 2-5/8 inch (66 mm) profile is 3'-3" (1.0 m) with a minimum width of 2'-3" (0.70 m). Maximum panel height is 9'-10" (3.0 m) with a minimum width of 2'-3" (0.70 m). Refer to NanaWall size chart.

E.g. 3'-3" x 7'-8" (1.0 x 2.35 m) or 2'-3" x 9'-10" (0.7 x 3.0 m).

Maximum panel width for the 3-1/16 inch (78 mm) profile is 3'-3" (1.0 m) with a minimum width of 2'-9 1/2" (0.85 m). Maximum panel height is 9'-2" (2.8 m) with a minimum width of 2'-9 1/2" (0.85 m).

Glass panels higher than 8'-4" (2.55 m) need to be stiffened with a horizontal mullion.

3. Rail Depth:
 - a. 2-5/8 inch (66 mm)

NOTE: 2-5/8 inch above is standard; option below may require an upcharge.

- b. [**3-1/16 inch (78 mm)**]

4. Head and Jamb Rail Width:

- a. 3-1/16 inch (78 mm)

NOTE: 3-1/6 inch above is standard; other options below may require an upcharge.

- b. [**3-3/4 inch (95 mm)**]
- c. [**4-3/4 inch (120 mm)**]

5. Bottom Rail Width:

- a. 3-1/16 inch (78 mm)
- b. [**Manufacturer's standard kickplate with height indicated.**]

NOTE: When selecting kickplate option for the bottom rail, select and indicate a height of between 5 and 12 inches (127 and 305 mm); this option may require an upcharge.

6. Wood: Cross-grained, triple laminated solid wood with mortise and tenon, and glued and pinned corners. Veneered wood not acceptable.

NOTE: PEFC certified wood (Douglas fir) does NOT qualify for LEED credit but does meet US Lacey Act requirements.

Selected LEED credit qualified FSC Certified wood available upon request.

- a. Species:
 - 1). [**PEFC certified Douglas fir**]
 - 2). [**European Pine**]
 - 3). [**Meranti**]
 - 4). [**Western Hemlock**]
 - 5). [**Spruce**]
 - 6). [**European Oak**]

7). [**Sapelli Mahogany**]

NOTE: Beech, Maple or Cherry are for interior applications only.

8). [**Beach**]

9). [**Maple**]

10). [**Cherry**]

- b. Wood Finish: Provide factory water-based, open pore [**clear sanding sealer for stain**] [**base coat applied for paint**] with one additional clear coat; See Section 09 90 00 for field finish.

NOTE: Before installation, field finish wood with a minimum two coats for final protective finish.

7. Aluminum Extrusion: Attached to interior wood with thermal isolating polyamide connectors.

- a. Alloy: AIMgSi0.5; 6063-T5 (F-22 - European standard)
b. Thickness: 0.078 inch (2.0 mm) nominal
c. Thermal Break: 7/8 inch (22 mm) wide polyamide plastic reinforced with glass fibers.
d. Finish (AAMA 611): Clear, anodized

B. Glass and Glazing:

1. Safety Glazing: In compliance with ANSI Z97.1 and CPSC 16CFR 1201.

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

- a. Glass Acoustical Performance (ASTM E413 and ASTM E1332): STC (Rw)

NOTE: Acoustical system STC ratings below are engineer-calculated conversions of European tests for the full panel system per ASTM E413 and ASTM E1332.

- 1). [**37 (37); 1-5/32 inch (29 mm) double IGU, air filled, 4mm + 10mm tempered glass**]

NOTE: Acoustical ratings listed below are for the **glass only** and not the full panel system but will most likely be within 2 dB of the glass STC rating when the frame is added.

- 2). [**28; 1/4 inch (6 mm) single, tempered glass**]
3). [**32; 1/4 inch (6 mm) single, laminated glass**]
4). [**32; 15/16 inch (24 mm) double IGU, tempered glass**]
5). [**39; 15/16 inch (24 mm) double IGU, laminated and tempered glass**]
6). [**41-43; 15/16 inch (24 mm) double IGU, double-laminated glass**]
7). [**39-45; 1-1/2 inch (38 mm) triple IGU, laminated and tempered glass**]

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

2. Manufacturer's [**tempered**] [**and**] [**laminated**] glass lites, 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.

Anti-fall glazing available where required.

IGU glazing is capable of meeting 2010 Energy Star requirements of a U-factor ≤ 0.32 and SHGC ≤ 0.30 for all climate zones.

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. Glass Lite / Insulated Glass Unit (IGU):
- 1). [**Single:** **1/4 inch (6 mm) thick.**]
 - 2). [**Double IGU:**
 - a). **15/16 inch (24 mm) thick.**]
 - b). **1-5/32 inch (29 mm) thick.**]
 - 3). [**Triple IGU:**
 - a). **1-1/8 inch (28 mm) thick.**]
 - b). **1-1/2 inch (38 mm) thick.**]

NOTE: Subparagraphs below are options for Double and Triple IGU items above.

- c). IGU Fill: < insert IGU fill >
 - i. [**Low-E**]
 - ii. [**Argon filled**]
 - iii. [**Air filled**]
 - d). Glass Spacers: Manufacturer's standard [**gray**] [**dark bronze**] finish;
[**without**] [**with**] capillary tubes.
- b. Glass Lite Type: < insert glass type >
- 1). Standard

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

- 2). [**Low iron**]
- 3). [**Solar bronze**]
- 4). [**Solar gray**]
- 5). [**Ornilux bird safe**]

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 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 thumbturn, 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 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.

- e. [**Secondary Swing Panel: Provide two-point locking with flat handles on inside only for the secondary swing panel.**]
- f. Lever Handle - Finish:
 - 1). Brushed satin stainless steel

NOTE: Lever handle above is standard; optional handle types below may require an upcharge.

ADA handle only available in "Brushed satin stainless steel"

- 2). [**Titanium black stainless steel**]
- 3). [**Oil rubbed bronze solid brass**]
- 4). [**Satin nickel solid brass**]
- g. Locking:
 - 1). Standard profile cylinder
 - 2). Adapter for Small Format Interchangeable Core (SFIC)
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 Swing Panel: Provide manufacturer's push-pull handles with separate lockset and dead bolt.
 - a. Push-pull handles in a brushed stainless steel finish and stainless steel flat handles in a [**brushed satin finish.**] [**titanium black finish.**]

NOTE: Option above is recommended with a door closer but, in order to slide the swing panel, it needs to be attached to a side jamb or disengaged.

4. Main Entry Panel(s) for Models WITH a [**Pair of**] Swing Panel(s): No hardware or locking provided by manufacturer; Field installed panic device [**s on both panels**] by Section 08 71 00.
5. Main Entry Pair of Panels on Inswing Models WITHOUT a Swing Panel: Provide manufacturer's standard L-shaped handle on the inside, flat handle on the outside and lockset with profile cylinder. Operation of lockset is by turn of key from the outside and with a thumbturn from the inside with two-point locking hardware operated by 180° turn of the handle.
 - a. L-Shaped Handles - Finish:
 - 1). Brushed satin stainless steel

NOTE: Handle above is standard; optional handle finishes below may require an upcharge.

- 2). [**Titanium black stainless steel**]
6. Main Entry Pair of Panels on Outswing Models WITHOUT a Swing Panel: Provide manufacturer's standard flat handle on the inside and outside and a lockset with profile cylinder. Operation of lockset is by turn of key from the outside and from inside with two-point locking hardware operated by 180° turn of the handle.

NOTE: Above keying operation from inside may not meet egress requirements.

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

8. Secondary Panels and Pairs of Folding Panels: Provide manufacturer's [**flat handles**] [**removable custodial handles**] and concealed one or two-point locking hardware operated by 180° turn of handle between each pair.

NOTE: Flat handles above is standard; optional removable custodial handles may require an upcharge.

- a. Face applied flush bolt locking not acceptable.
9. Flat Handle - Finish:
 - a. Brushed satin stainless steel

NOTE: Handle above is standard; optional handle types below may require an upcharge.

- b. [**Titanium black stainless steel**]
 - c. [**Dark brown powder coated**]
 - d. [**Silver gray powder coated**]
10. Handle Height: 41-3/8 inch (105 cm) centered from bottom of panel or as otherwise indicated.
 11. 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).
 12. 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-lubricating, ball bearing multi-rollers. Surface mounted hinges and running carriages NOT acceptable.
1. For Each Pair of Folding Panels:
 - a. Top Hung System (WD66/o): Provide independent cardanic suspension for four (4) wheeled rollers coated with fiberglass reinforced polyamide upper running carriage and lower guide carriage.
 - b. Floor Mounted System (WD66/u): Provide upper guide carriage and lower running carriage with four vertical stainless steel wheels and two horizontal wheels. Vertical wheels to ride on stainless steel guide track covers over the full length of sill track. Carrying capacity of lower running carriage to be a minimum 150 lbs. (70 kg).

NOTE: Select from the following Threshold Finish types, edit to suit and delete those not meeting project requirements.

Floor mounted WD66/u system NOT available with the (Not Thermally Broken) Flush Sill.

2. Sill Type: < **insert sill type** >
 - a. [**Standard flush sill (thermally broken)**]
 - b. [**Alternate flush sill (not thermally broken)**]
 - c. [**Low profile saddle sill (thermally broken)**]
 - d. [**Higher weather performance raised sill (thermally broken)**]
 - e. Finish: Aluminum with a [**clear**] [**dark bronze**] anodized finish.
 - f. Cover plate over sill NOT acceptable.
 - g. For ADA Compliance: Provide gasket to cover the channel in the sill at swing doors.
 3. Panel Hinges and Spine: [**Standard clear**] [**Dark bronze**] anodized aluminum with hinges connected to spine and NOT directly into wood. Stainless steel security hinge pins with set screws.
 4. Adjustment: Provide hinge adjustments of 5/32 inch (4 mm) in width and in height - up and down, without removing panels from tracks and without needing to remove panels from tracks.
- E. Weatherstripping: Manufacturer's double layer EPDM between panels, EPDM gasket and Q-lon gasket, or triple layer EPDM, 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 weatherstripping is determined at the factory by the direction of swing, the panel configuration, the type of locking and the type of sill.

Double layer EPDM is standard with the 2-5/8 inch (66 mm) deep profile.

Triple layer EPDM is for use with 3-1/16 inch (78 mm) deep profiles.

2.04 FABRICATION

- A. Folding Glass Wall: Use solid, three layer, cross grained, solid wood frame and panel profiles connected to extruded aluminum hinges and spines, sliding and folding hardware, locking

hardware and handles, threshold and track, glass and glazing and weatherstripping.

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.
4. Wood frame and panel components to be sealed with a clear sand sealer or primer.

2.05 ACCESSORIES

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

NOTE: Screen ONE is 'non-pleated' while Screen Classic is 'pleated.'
Select 'ONE' or 'Classic,' deleting option not chosen.

- B. Insect Screen Panels: Fully retractable non-pleated screen made of ultra-strong, UV resistant fiberglass mesh housed in a single cartridge riding on a single track.

1. Basis of Design Product by Manufacturer: **Screen ONE** or an Architect acceptable equivalent subject to project requirements.
2. Finish - Aluminum Top Track, Side Jambs and Vertical Struts:
 - a. White powder coated
 - b. [**Clear anodized**]
 - c. [**Black powder coated**]
 - d. [**Classic bronze powder coated**]

NOTE: Above options are standard. Check with NanaWall regarding other available finishes, which may require an upcharge.

- C. Insect Screen Panels: A series of top-hung collapsible pleated UV resistant fiberglass mesh screen panels riding on a single narrow ADA compliant 1/4 inch (5 mm) floor track. Each 4 inch (10 cm) wide vertical cassette can expand to 3'-3" (1 m) wide.

1. Basis of Design Product by Manufacturer: **Screen Classic** or an Architect acceptable equivalent subject to project requirements.
2. Finish - Aluminum Top Track, Side Jambs and Vertical Struts:
 - a. White powder coated
 - b. [**Clear anodized**]
 - c. [**Dark bronze anodized**]

NOTE: Above options are standard. Check with NanaWall regarding powder coated and other available finishes, which may require an upcharge.

- a. [**Powder coated with color as selected by architect.**]
3. Screen Track Stacking: [**Within opening**] [**Extended beyond opening**]

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 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. Wood Finishing: Field finish wood under Section 09 90 00, Painting and Coating; seal and finish promptly after installation and prior to exposure to weather.
 5. Install panels, handles, lockset, screens, weatherstripping 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 particular requirements of a specific construction project.

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