

SECTION 08 32 13

SLIDING ALUMINUM FRAMED GLASS DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes furnishing and installing a floor track supported, minimal aluminum framed, glass door panel / wall system that includes:
1. Minimal profile aluminum panel framing.
 2. Integrated aluminum head guide rail tracks.
 3. Integrated aluminum running floor rail sill tracks with stainless steel rail runner inserts.
 4. Manual sliding hardware
 - a. Carrier rollers, ball bearings, and wheels.
 - b. Locking hardware with handle.
 - c. Gasket seals and brushes.
 5. Glass and glazing.
 6. Insect Screen by others (optional).
 7. Accessories as required for a complete working installation.

NOTE: Switched or remotely activated "Electrical Drive Assembly" operation is available by others as an option.

8. Electrical drive assembly.
- 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 03 30 00, Cast-In-Place Concrete: Inset floor track.
 3. Section 06 10 00, Rough Carpentry: Wood framing R.O. and blocking.
 4. Section 07 90 00, Joint Protection.
 5. Section 09 22 16, Non-Structural Metal Framing: Metal framing R.O. and reinforcement.
 6. Section 10 22 43, Sliding Glass Partitions: NanaWall cero.

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 501, Standard Test Method for Water Penetration of Windows, Curtain Walls, and Doors Using Dynamic Pressure.
 - b. AAMA 502, Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
 - c. AAMA 611, Voluntary Specification for Anodized Architectural Aluminum.

- d. AAMA 2604, Voluntary Specifications, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- e. AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS-2011, 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, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - d. ASTM E413, Classification for Rating Sound Insulation.
 - e. ASTM E1332, Standard Classification for Rating Outdoor-Indoor Sound Attenuation.
 - f. ASTM F842, Standard Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies.
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.
 - b. CSA Group (Canadian Standards Association); www.csagroup.org/global/en/home
 - c. CSA A440S1 - The Canadian supplement to North American (NAFS) standards.
6. DIN. "Deutsches Institut für Normung" (German Institute for Standardization); www.enstandard.eu/din-standards; EN. "European Standards"; www.en-standard.eu; and ISO. "International Organization for Standardization"; www.iso.org/iso/home/store/catalogue_ics.htm
 - 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 door sets, windows, curtain walling, grilles, and shutters - Burglar resistance - Requirements and classification.
 - c. DIN EN 1628, Pedestrian door sets, windows, curtain walling, grilles, and shutters - Burglar resistance - Test method for the determination of resistance under static loading.
 - d. DIN EN 1629, Pedestrian door sets, windows, curtain walling, grilles, and shutters - Burglar resistance - Test method for the determination of resistance under dynamic loading.
 - e. DIN EN 1630, Pedestrian door sets, windows, curtain walling, grilles, and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts.
 - f. DIN EN ISO 717-1, Acoustics - Rating of sound insulation in buildings and building elements.
 - g. DIN EN ISO 9001, 2015 quality management system registration.
 - h. DIN EN ISO 10140-1, 2, 3, 4 & 5, Airborne sound measurement.
 - i. DIN EN ISO 14001, 2015 environmental management system registration.

- j. DIN 18040-1, Construction of accessible buildings - Design principles - Part 1: Publicly accessible buildings.
- 7. Energy Star, U.S. Environmental Protection Agency (EPA) Program; www.energystar.gov
- 8. EPD. Environmental Product Declaration; <https://www.ift-rosenheim.de/>
 - a. DIN EN ISO 14025, Environmental Labels and Declarations – Type III Environmental Declarations – Principles and Procedures.
 - b. DIN EN ISO 14040, Environmental Management – Life Cycle Assessment – Principles and Framework.
 - c. DIN EN ISO 14044, Environmental Management – Life Cycle Assessment – Requirement and Guidelines.
 - d. DIN EN ISO 15804 + A2, Sustainability of Construction Works – Environment Product Declarations – Core Rules for Product Category of Construction Products.
- 9. HPD. Health Product Declaration v2.3; <https://www.hpd-collaborative.org/>
 - a. VOC Emission, Inherently non-emitting source per LEED v4.
- 10. FL. Florida Building Commission – Product Approval; https://floridabuilding.org/pr/pr_app_srch.aspx
- 11. NFRC. National Fenestration Rating Council; www.nfrc.org
 - a. ANSI/NFRC 100, Procedure for Determining Fenestration Product U-factors
 - b. ANSI/NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
 - c. ANSI/NFRC 400, Procedure for Determining Fenestration Product Air Leakage
 - d. ANSI/NFRC 500, Procedure for Determining Fenestration Product Condensation Resistance Rating Values

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination by Contractor:
 - 1. Coordinate inset bottom track with structural drawings. See Section 03 30 00.
 - 2. Coordinate Sliding Glass Wall 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 Sliding Glass Wall 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 Sliding Glass Wall system component sizes, dimensions and framing R.O., configuration, sliding panels, stacking layout, typical head jamb, side jambs and sill details, type of glazing material, and field measurements.
- 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. 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 Sliding Glass Walls.

- 4). MR Credit 3: Materials Reuse - 5% (MRc3.1) or 10% (MRc3.2)
- b. 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.
2. **LEED v4 for Interior Design and Construction (ID&C)** Credits. Complete online LEED forms and submit other required materials as follows:
 - a. Materials and Resources (MR) Credits:

NOTE: MR Credit 1 below can apply to reusing salvaged Sliding Glass Walls.

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

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. MRc1.1, MRc1.2, MRc2, MRc3, MRc6, IEQc2, IEQc8.1, IEQc8.2
2. **LEED v4** (ID&C). Submit information and documentation to complete LEED™ Worksheet Templates for the following credits:
 - a. MRc1, EQc7, EQc8, EQc9

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Glass Door 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 thirty five (35) years' experience in the manufacture of folding-sliding door systems for large opening glass walls for 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 Sliding Glass Wall 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, Contractor to inspect the shipment to ensure it is complete, in good condition and meets project requirements.
 2. Contractor to 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.). Mark field measurements on product drawing submittal.

1.08 WARRANTY

- A. **Manufacturer Warranty:** Provide All Glass Sliding Glass Wall 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, and only when installed by manufacturer's certified trained installer.
1. **Warranty Period** beginning with the earliest of 120 days from Date of Delivery or Date of Substantial Completion:
 - a. Rollers: Ten (10) years.
 - b. Insulated Glass Seal Failure: Five (5) years.
 - c. 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: **cero® by NanaWall** 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), or
 - b. Document 00 63 25, Substitution Request Form (During Construction)

2.02 PERFORMANCE / DESIGN CRITERIA

NOTE: Select one of the four Performance Criteria Sill type paragraphs for Air Infiltration, Water Penetration, Structural Loading, and Acoustical Performance, deleting items not chosen. For structural loading, choose standard or reinforced.

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, 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.

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): **cero III Triple-Glazed with Performance Sill**
1. Sliding Glass Door Units tested to AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11:
 - a. Standard Unit: Class CW-PG40-SD 23' 1" x 10' 2" (7047 mm x 3122 mm).
 - b. Reinforced Unit: Class CW-PG75-SD 23' 1" x 10' 2" (7047 mm x 3122 mm).
 2. Air Infiltration/Exfiltration (ASTM E283, CSA A440-11, and NAFS-2011) @ 1.57 psf:
0.05 cfm/ft² / 0.04 cfm/ft² / A3
 3. Static Water Penetration (ASTM E547 and E331): 12 psf (600 Pa)
 4. Dynamic Water Penetration (AAMA 501): 12 psf (600 Pa)
 5. Structural Loading (ASTM E330) Standard Unit:
 - 1). Windload Resistance: Pass L/175
 - 2). Design Pressure Positive: 40 psf (1920 Pa)
 - 3). Design Pressure Negative: 40 psf (1920 Pa)
 - b. Reinforced Unit

- 1). Windload Resistance: Pass L/175
- 2). Design Pressure Positive: 80 psf (3840 Pa)
- 3). Design Pressure Negative: 73 psf (3500 Pa)
- 6. Acoustical Performance (ASTM E-90 and E-1332):
 - a. With 50 Db glass, unit STC (Rw) of 44 and OITC 35
- 7. Burglary Protection (EN 1628, 1629, 1630 / EN 1627):
 - a. Standard, Class RC2 (WK2)
 - b. Class RC3 (WK3)
- B. Performance Criteria (Lab Tested): **cero II Double-Glazed with Performance Sill**
 - 1. Sliding Glass Door Units tested to AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11:
 - a. Standard Unit: Class CW-PG35-SD 23' 7" x 10' 3" (7188 mm x 3130 mm)
 - b. Reinforced Unit: Class CW-PG60-SD 23' 7" x 10' 3" (7188 mm x 3130 mm)
 - 2. Air Infiltration/Exfiltration (ASTM E283, CSA A440-11 and NAFS-2011) @ 1.57 psf:
0.09 cfm/ft² / 0.08 cfm/ft² / A3
 - 3. Static Water Penetration (ASTM E547 and E331): 12 psf (600 Pa)
 - 4. Dynamic Water Penetration (AAMA 501): 12 psf (600 Pa)
 - 5. Structural Loading (ASTM E330) Standard Unit:
 - 1). Windload Resistance: Pass L/175
 - 2). Design Pressure Positive: 35 psf (1680 Pa)
 - 3). Design Pressure Negative: 35 psf (1680 Pa)
 - b. Reinforced Unit:
 - 1). Windload Resistance: Pass L/175
 - 2). Design Pressure Positive: 65 psf (3120 Pa)
 - 3). Design Pressure Negative: 60 psf (2880 Pa)
 - 6. Acoustical Performance (ASTM E-90 and E-1332):
 - a. With 47 Db glass, unit STC (Rw) of 43 and OITC 34
 - 7. Burglary Protection (EN 1628, 1629, 1630 / EN 1627): Standard and Class RC2 (WK2)
- C. Performance Criteria (Lab Tested): **cero II Double-Glazed with Minimal Sill**
 - 1. Sliding Glass Door Units tested to AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11:
 - a. Reinforced Unit: Class CW-PG40 8' 11" x 7' 2" (2710 mm x 2175 mm)
 - 2. Air Infiltration/Exfiltration (ASTM E283, CSA A440-11 and NAFS-2011) @ 1.57 psf:
0.08 cfm/ft² / 0.08 cfm/ft² / A3
 - a. 6.24 psf (300 Pa): 0.19 cfm/ft² / 0.25 cfm/ft²
 - 3. Static Water Penetration (ASTM E547 and E331): 5.43 psf (260 Pa)

4. Structural Loading (ASTM E330) Standard Unit:

- | | | |
|-------------------------------|-------------------|------------|
| 1). Windload Resistance: | | Pass L/175 |
| 2). Design Pressure Positive: | 100 psf (4800 Pa) | |
| 3). Design Pressure Negative: | 100 psf (4800 Pa) | |

b. Reinforced Unit:

- | | | |
|-------------------------------|-------------------|--|
| 1). Windload Resistance: | | |
| 2). Design Pressure Positive: | 100 psf (4800 Pa) | |
| 3). Design Pressure Negative: | 100 psf (4800 Pa) | |

5. Burglary Protection (EN 1628, 1629, 1630 / EN 1627): Standard and Class RC2 (WK2)

D. Performance Criteria (Lab Tested): **cero II Double-Glazed with Flush Sill**

1. Air Infiltration/Exfiltration (ASTM E283, CSA A440-11 and NAFS-2011) @ 1.57 psf:
0.16 cfm/ft² / 0.13 cfm/ft² / A2
2. Static Water Penetration (ASTM E547 and E331): 3 psf (150 Pa) tested with U-channel inside
3. Structural Loading (ASTM E330) Standard Unit:

1). Windload Resistance:		Pass L/175
2). Design Pressure Positive:	35 psf (1680 Pa)	
3). Design Pressure Negative:	35 psf (1680 Pa)	
4. Burglary Protection (EN 1628, 1629, 1630 / EN 1627): Standard and Class RC2 (WK2)

NOTE: Besides a certified burglary resistant frame option, cero® can also be fitted with an electronic security option by others.

E. For both cero II and cero III with all sill options:

- | | | |
|---|------------------------------------|-----------------------------------|
| 1. System - Life Cycle Performance (DIN EN 1191/12400): | | 40,000 cycles |
| 2. Forced Entry (ASTM F842): | | Pass |
| 3. Operating Force (ASTM E2068): | Initiate Motion
60 N (13.2 lbf) | Maintain Motion
20 N (4.4 lbf) |
| 4. Barrier-Free Accessibility (DIN 18040): | | Pass |

NOTE: For the highest levels of insulation and energy efficiency, cero's profiles are thermally broken with glass fiber reinforced polyamide with thermal breaks aligned in the same plane. Thermal performance values vary depending on the glass, system, and configuration used in each individual application. U-Values as low as 0.29 and SHGC values as low as 0.19 are available to meet energy code requirements. Condensation may occur when system is installed in cold climates or in a facility with high indoor humidity. If condensation could be an issue for your application, NanaWall recommends taking appropriate measures during the design and construction phase to reduce or eliminate the possibility of condensation. There are many third-party sources discussing the nature of condensation and ways to reduce or eliminate condensation, including publications by AAMA, WDMA, and Efficient Windows Collaborative.

- | | |
|--|--|
| 5. Thermal Performance (U-factor): | NFRC 100 (Rated, Certified, and Labeled) |
| 6. Solar Heat Gain Coefficient (SHGC) + Visible Light Transmission (VT): | NFRC 200 (Rated, Certified, and Labeled) |
| 7. Air Leakage: | NFRC 400 (Rated, Certified, and Labeled) |
| 8. Condensation Resistance Factor (CRF): | NFRC 500 (Rated, Certified, and Labeled) |

NOTE: With specific glazing, NFRC 100, 200, 400, and 500 ratings of the cero® system can 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 NanaWall 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.

9. EPA Energy Star:

Meets requirements

NOTE: (For guidance only as manufacturer is not a participant of the Energy Star Program.)

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):

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

10. Environmental Product Declaration (EPD):

Meets requirements

NOTE: Environmental Product Declaration (EPD) conducted Life Cycle Assessment (LCA) in accordance with DIN EN 15804, DIN EN ISO 14040, DIN EN ISO 14044, and ISO 14025. Life cycle tested from supply of raw material to end-of-life stage of the system. Environmental Impact results as per 1 m² of the product system.

Declaration is based on PCR documents EN 17213 “PCR for windows and doors”, “PCR Part A” PCR-A-1.0:2023 and “Doors and gates” PCR-TT-3.0:2023.

Environmental Product Declaration EPD-SGS-GB-63.0 is valid until 16 April 2029. Contact NanaWall for more information.

11. 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.

F. Florida Building Code:

1. Florida Product Approval for cero II standard units with panel sizes up to 23' 0" (7013 mm) wide x 10' 2" (3114 mm) high subject to manufacturer size chart: FL38028.2

NOTE: FL38028.2 web-link is:

https://floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDqtoCaySjU0lex7xxc6diWt1n4LePKq81ik%2fIJz3dKFtg%3d%3d

2. Florida Product Approval for cero II reinforced units with panel sizes up to 23' 0" (7013 mm) wide x 10' 2" (3114 mm) high subject to manufacturer's size chart: FL38028.1

NOTE: FL38028.1 web-link is:

https://floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDqtoCaySjU0lex7xxc6diWt1n4LePKq81ik%2fIJz3dKFtg%3d%3d

3. Florida Product Approval for cero III standard units with panel sizes up to 23' 0" (7013 mm) wide x 10' 2" (3114 mm) high subject to manufacturer's size chart: FL35024.2

NOTE: FL35024.2 web-link is:

https://floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDqtw2pk%2fDHN%2ftILXGB%2f7M2xi3XnmzKbcubcOC2VJVChxw%3d%3d

4. Florida Product Approval for cero III reinforced units with panel sizes up to 23' 0" (7013 mm) wide x 10' 2" (3114 mm) high subject to manufacturer's size chart: FL35024.1

NOTE: FL35024.1 web-link is:

https://floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDqtw2pk%2fDHN%2ftILXGB%2f7M2xi3XnmzKbcubcOC2VJVChxw%3d%3d

G. 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.

NOTE: 98% of the cero® system allows daylight through glass with only 2% opaque metal frame.

- 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.

2. LEED v4 for Interior Design and Construction (ID&C)

- a. MRc1: *NanaWall* can be easily disassembled for salvage and reuse.

NOTE: 98% of the cero® system allows daylight through glass with only 2% opaque metal frame.

- b. EQc7: *NanaWall* glass wall assembly borrowed light brings daylight deeper into the floor plate.
- c. EQc8: *NanaWall* glass wall assemblies provide direct outdoor lines of sight.

H. Design Criteria:

1. Sizes and Configurations: As indicated by the drawings for selected number, size of panels, and location of tracks.

NOTE: With cero's optional automation accessory by others, the large panels can be operated and securely locked with a simple touch of a button or through the use of a cell phone app. The automation feature provides effortless and quiet operation. Key pads can be located on the interior and/or exterior for convenience and peace of mind. Please contact NanaWall for details.

To meet various design intents, matching fixed glass panels are available to complement the cero® system.

2. Unit Operation: [**Manual**] [**Motorized**]

NOTE: cero® is available in numerous configurations with combinations of sliding and fixed panels. Systems are available with up to 5 or more tracks for the Performance and Flush sills with pocketed and open corner configurations possible. For Minimal Sill, up to 5 or more tracks are also possible. Contact NanaWall for additional options. Please see <https://www.nanawall.com/resources/cero-iii#resources> for configuration animation options.

3. Panel Configuration:
 - a. [Straight]
 - b. [90° angle corner]
 - c. [Fixed all-glass 90° angle corner]

NOTE: Z-Style and U-Style configuration possible. Contact NanaWall.

4. Stack Storage Configuration: Side stack in track as indicated
5. Mounting Type: Floor track supported

2.03 MATERIALS

NOTE: A system interlock design with numerous layers of double fin weather seals and soft bubble gaskets allows for soft opening and closing with no metal-to-metal contact. The transparent bumpers on the top and bottom vertical stile facilitates a soft opening process.

This sophisticated design also allows for panel deflection. cero's panel and interlock design are engineered to accommodate panel and glass deflection with a built-in tolerance of up to 1/4 inch (6 mm). It also minimizes the concern of vertical metal stiles touching adjacent sliding panel glass during the opening and closing process.

- A. Sliding Glass Wall Description: Sliding and fixed, large-area glass panels in an extruded thermally broken aluminum frame. Panels slide on multiple stainless-steel carrier rollers with double-row deep groove ball-bearings and rolls on single or tandem stainless-steel rail runner inserts in floor track. Flat 2-point locking handle, gasket seals and brushes, a hidden integrated drainage offset duct system, and glazing rebate ventilation for controlled back-ventilation of the panel edge. Frame is thermally isolated with glass-fiber reinforced polyamide cross-pieces.

1. Linear panel system load transfer to structure at floor.

NOTE: cero II Double-Glazed: Maximum panel Widths up to 7' 4-1/2" (2250 mm) and Heights up to 13' 1" (4000 mm). Maximum panel Widths of 7' 1" (2150 mm) and Height up to 14' (4250 mm).

cero III Triple-Glazed: Maximum panel Widths up to 9' 10" (3000 mm) and Heights up to 15' (4550 mm).

Contact NanaWall for sizing questions. Please note that additional freight charges may apply for larger panel sizes.

2. Panel Size: <insert dimension> x <insert dimension> inches (<insert dimension> mm x <insert dimension> mm)

NOTE: Retain 2-1/16 inches (52 mm) for cero II Double-Glazed or 3-1/8 inches (79 mm) for cero III Triple-Glazed in subparagraph below.

3. Top & Bottom Rail Depth: [2-1/16 inches (52 mm)] [3-1/8 inches (79 mm)]
4. Top & Bottom Rail and Vertical Stile Exposed Face Width: 1-5/16 inch (34 mm)

NOTE: For installations requiring increased drainage due to exposure, a matching integrated drainage duct system by others is available.

5. Floor Track:

a. Performance Sill (For cero II and cero III)

- 1). System to be capable of 1/8 inch (3 mm) plus height adjustments without removing panels from tracks.
- 2). Systems without adjustment capability not acceptable.
- 3). Factory fabricated hidden integrated drainage offset duct system with drainage [**down**] [**out to the exterior face**].
- 4). No base beneath floor track.

NOTE: Retain optional "ADA performance sill inserts" below or use a flush sill (for cero II only).

- 5). Aluminum ADA performance sill inserts.
- 6). Locking receiver cover profile sill extension.

NOTE: Finishing flooring or cosmetic inserts for the Sill below installed by others.

b. Double Glazed cero II Sill:

- 1). [Minimal sill – Thermally broken]
 - 2). [Flush sill – ADA compliant]
- a). No base beneath floor track.

NOTE: cero® narrow stiles and rails have a symmetrical picture frame effect. Connection between side jamb to frame are fixed with concealed connector to prevent twisting of frame, jamb, and track. Surrounding frame exposure may be 0 to 3-1/8 inches (0 to 79 mm), either fully recessed, semi-recessed, or fully exposed.

6. Surround Frame [Fully recessed] [Semi-recessed] [Fully exposed]

7. Aluminum Extrusions: AIMgSi0.5 alloy, 6063-T5 (EN AW-6060 T66 - F-22)

- a. Thickness: 0.059 to 0.157 inch (1.5 mm to 4 mm)
- b. Thermal Break: Glass fiber reinforced polyamide cross pieces aligned in the same plane through the frame and panels. Offset thermal breaks not acceptable.

NOTE: Retain 5/8 inch (16 mm) at frame for cero II Double-Glazed or 1-3/8 inch (44 mm) at frame for cero III Triple-Glazed in "Thermal Break" subparagraphs below.

- 1). Thickness for cero II: 5/8 inch (16 mm) at frame; 15/16 inch (24 mm) at panel.
- 2). Thickness for cero III: 1-3/8 inch (34 mm) at frame; 1-1/32 inch (26 mm) at panel.

8. Exposed Aluminum Frame and Track Finish:

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

NOTE: cero® frames are available in 50 standard colors with over 200 colors available in powder coat and anodized finishes. Custom matched colors and simulated wood effects are also available. Check with NanaWall regarding powder coated and other available finishes. Anodized "metallic," full "RAL selection", and "custom finishes" may require an upcharge.

- a. Finish - Anodized (AAMA 611):
 - 1). [Clear]
 - 2). [Black]

b. Finish - 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.]

B. Glass and Glazing:

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

NOTE: Select and edit glass type(s) to meet building code, acoustic, wind load design, bullet resistant and/or security, and other project requirements with other glass available from manufacturer.

cero® panel design has the extremely high flexural strength of 17,405 psi (120 N/mm²) allowing it to accommodate large sheets of glass.

Large panel installation depth may require the use of available anti-fall glazing.

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

Glass lite thickness is determined by the glass supplier according to the size of the glass pane.

Contact NanaWall for the availability of other commercial glass types.

2. Manufacturer's insulated glazing units, dry glazed with glass stops on the inside. Glazing rebate ventilation for controlled back ventilation of the panel edge.

NOTE: Delete panel glazing subparagraph below not required. First option applies to cero II Double Glazed. The second option applies to cero III Triple-Glazed.

- a. Standard Panel Glazing: Double IGU. Thickness (8 / 20 / 8 mm)
 - 1). Clear Insulated
 - 2). Low E (argon filled), SKN 176
 - 3). Higher SHGC Low E (argon filled), XN II
 - 4). Lower SHGC Low E (argon filled), SN 51/28
 - 5). Low E (air filled), SKN 176
 - 6). Higher SHGC Low E (air filled), XN II
 - 7). Lower SHGC Low E (air filled), SN 51/28
- b. Standard Panel Glazing: Triple IGU. Thickness (8 / 14 / 6 / 14 / 8 mm)
 - 1). Clear Insulated
 - 2). Low E x 2 (argon filled), SKN 176
 - 3). Higher SHGC Low E x 2 (argon filled), XN III
 - 4). Lower SHGC Low E x 2 (argon filled), SN 51/28
 - 5). Low E x 2 (air filled), SKN 176
 - 6). Higher SHGC Low E x 2 (air filled), XN III
 - 7). Lower SHGC Low E x 2 (air filled), SN 51/28
- c. Glass Spacer Bar: Manufacturer's standard [**silver gray**] [**black**] finish.

NOTE: Units requiring acoustic performance for cero II keep the following subparagraph. Delete acoustic glazing subparagraphs below if not required.

3. Manufacturer's [**tempered**] [**laminated**] acoustical glazing for cero II: Glass Acoustical Performance (ASTM E413 and ASTM E1332): STC.
 - a. Insulated Glass Unit (IGU) Lites:
 - 1). 1-3/8 inch (36 mm) double IGU, 12 mm + 12 mm STC 50 laminated glass to achieve unit STC of 43 and OITC 34.
 - 2). 1-3/8 inch (36 mm) double IGU, 8 mm + 8 mm STC 44 laminated glass to achieve unit STC of 38.
 - 3). 1-3/8 inch (36 mm) double IGU, 10 mm + 10 mm STC 38 tempered glass to achieve unit STC of 33 and OITC 29.

NOTE: Delete glass treatment option not required. Standard "Reduced iron" heat soaked tempered glass has a VLT of 89% or higher, while "Low iron" has a VLT of 91% or higher. Contact NanaWall for Low iron, Solar bronze, Solar gray, and Bird Safe glass treatment.

4. Glass Treatment: Standard reduced iron, heat soaked

NOTE: "Alarmed Glazing" by others Subparagraph below is an option.

5. Alarmed Glazing: Connection wiring to alarm system, position monitoring, locking detection and notification systems such as glass-breakage sensors by others.

NOTE: Retain "single" option below with cero II Double-Glazed or "tandem" with cero III Triple-Glazed.

- C. Sliding Hardware: Stainless steel carriers on dual ball-bearings rolling and gothic arch shaped wheels per panel on [**single**] [**tandem**] stainless steel rail runners inserted in floor track.
 1. Minimum two (2) carrier rollers attached to each sliding panel. Stainless steel roller with 'gothic arch design' concealed in the sliding panel aluminum frame profile not bridging the thermal break. Integrated, replaceable brushes on both ends and in front of panel lower rail to ensure clean, smooth wheel/roller operation.
 - a. Roller ball bearings of encapsulated self-lubricating steel balls.
 - b. Replaceable rollers (without removing the panels).
 - c. Rollers located in the sill profile are not acceptable.
 - d. Gothic arch wheel bearing design with 2-point contact to stainless steel bottom track.
 - e. Rollers run above floor plane and can operate smoothly over debris obstructions.

NOTE: Switched or remotely activated "Electrical Drive Assembly" operation is available by others as an option.

- f. [Electrical drive assembly].

NOTE: Retain "cero II Double-Glazed IGU Carrying Capacity" or "cero III Triple-Glazed IGU Carrying Capacity" below.

2. Maximum Double IGU Carrying Capacity on Single Carrier rails per Panel: 1,300 lb. (600 kg).
3. Maximum Triple IGU Carrying Capacity on Tandem Carrier Rails per Panel: 2,200 lb. (1,000 kg).

- D. Locking Systems: Concealed two-point locking mechanism as standard, with 1-inch (25 mm) throw in top and bottom adjustable receivers.

NOTE: Retain one of two "Flat 2-Point Locking Handle" below.

1. Flat 2-Point Locking Handle - Contemporary: [Brushed satin stainless steel] [Black titanium stainless steel]
2. Latch Throw: 1 inch (25 mm) locking latch in adjustable locking receivers.
 - a. Locking points adjustable by +/- 3/16 inch (+/- 5 mm).

- b. Pin locks not acceptable.

NOTE: For projects requiring outside locking and connecting to electronic security systems, an electromagnetic lock or maglock option by others.

For those with higher security concerns, cero® can meet the optional European security standards of either RC2 or RC3. European standards are more stringent than that of US forced entry testing.

The burglary resistance quality of a window/sliding door unit is largely determined by the interaction of frame profiles, glazing, and hardware. With the 15-minute forced entry test for RC2, a locked cero® passed security breach attempts using basic tools such as screwdrivers, pliers, vise grips, and wedges on the system. RC3 is a 20 minute test in which a crowbar is added to the basic tools in the attempt to open the closed and locked cero® system.

Retain Standard or Class RC2 for cero II Double-Glazed and Standard, Class RC2 or RC3 for cero III Triple-Glazed below.

3. Forced Entry: [**Standard**] [**Class RC2**] [**Class RC3**].

E. Other Components:

1. Structural Reinforcement: [**Standard**] [**Reinforced**]
2. Vertical Panel Interlock:
 - a. Interlock Depth: Determined by structural requirements, shallower interlock design is available.
 - 1). cero II Exterior: 7 3/16" (182 mm) or 8 11/16" (220 mm)
 - 2). cero III: 8 3/4" (222 mm) or 10 1/4" (260 mm)
 - b. Provide quadruple polyethylene-reinforced Q-Lon seals for vertical panel interlock with no metal-to-metal contact.
 - c. Maximum Panel Deflection at Interlock: 1/4 inch (7 mm).

NOTE: Reduced circle of sight possible for unobstructed view.

3. Edge Seals: Provide gasket seals all around the frame, inside and outside, and reinforced brushes, both sides and to the front.
4. Dark bronze anodized, fiberglass reinforced, inserts within head track, sill, and side jambs.

2.04 FABRICATION

- A. Extruded aluminum frame and rail profiles, sliding hardware, locking hardware and handles, and glass to construct sliding glass wall assembly.
1. Flush joints.
 2. Each unit factory pre-assembled and shipped KD with all components and installation instructions.
 3. Exposed work to be carefully matched to produce continuity of line and design with all joints.
 4. No raw edges visible at joints.

2.05 ACCESSORIES

- A. **Insect Screen:** Pleated Screen that slide and meet at the jamb for units using a Performance Sill

NOTE: Sizing for cero II: 3' 3" x 11' 6" (1000 mm x 3500 mm) and cero III: 3' 7" x 11' 6" (1100 mm x 3500 mm).

- B. **Insect Screen by Others:** Fully retractable non-pleated screen made of ultra-strong, polyester / PVC mesh riding on a single track.

NOTE: S4 Screen available up to 13' (4000 mm) in height.

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 BY CONTRACTOR

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. Verify that field measurements, substrates, tolerances, levelness, plumbness, cleanliness and other conditions are as required by the manufacturer, and ready to receive Work.
 - b. Verify block-out dimensions and structural support for flush recessed surrounding frame.
 - c. Verify the structural integrity of the header for deflection with live and dead loads limited to 1/4 inch (6 mm). Provide structural support on all four sides for lateral loads, and both wind load and eccentric load when the panels are stacked open.

NOTE: Structural support for lateral loads such as forced entry, etc. to be provided.

It's recommended that all building dead loads be applied to the header prior to installing the unit.

If so, and if a reasonable amount of time has been allowed for the effect of this dead load on the header, only then can the building live load be used to meet the above requirement of 1/4 inch (6 mm).

If not, 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 Sliding Glass Wall system in accordance with the Drawings, approved submittals, manufacturers' recommendations, and installation instructions, and as follows:

1. Properly seal around opening perimeter.
2. Securely attach anchorage devices to rigidly fit surrounding frame in place, level, straight, plumb and square. Install frame in proper elevation, plane, and location, and in proper alignment with other work. Integrate frames into walls, ceilings, and floors flush or as otherwise as indicated.
3. Lower track designed to drain; provide connections to allow for drainage.
4. Install glass panels, handles, lockset, and other accessories in accordance with manufacturer's recommendations and instructions.
5. Provide connections to alarm system, position monitoring and sensor notification systems.

3.03 FIELD QUALITY CONTROL

- A. Field Tests and Inspections per Section 01 40 00 of the following:

1. Verify the Sliding Glass Wall 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 Sliding Glass Wall 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.

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