



SECTION 08 43 33
FOLDING GLASS WALL SYSTEMS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Folding glass wall systems.
- B. Stacking glass wall systems.
- C. Clear glass wall systems.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 03 41 16 - Precast Concrete Slabs.
- C. Section 04 27 23 - Cavity Wall Unit Masonry.
- D. Section 05 40 00 - Cold-Formed Metal Framing.
- E. Section 06 10 00 - Rough Carpentry.
- F. Section 06 20 00 - Finish Carpentry.
- G. Section 07 21 19 - Foamed-In-Place Insulation.
- H. Section 07 46 16 - Aluminum Siding.
- I. Section 07 60 00 - Flashing and Sheet Metal.
- J. Section 07 90 00 - Joint Protection.

1.3 REFERENCES

- A. American Welding Society (AWS): Structural Welding Code.
- B. ASTM International (ASTM):
 - 1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
 - 2. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wires, Profiles, and Tubes.
 - 3. ASTM B241 - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tubes.
 - 4. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 - 5. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 6. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows,

- 7. Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - 8. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 9. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
 - 10. ASTM E1886 - Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missiles and Exposed To Cyclic Pressure Differentials.
 - 11. ASTM E1996 - Standard Specification For Performance Of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris In Hurricanes.
- C. Fenestration and Glazing Industry Alliance (FGIA):
- 1. AAMA 611 - Voluntary Specifications for Anodized Architectural Aluminum.
 - 2. AAMA 1503 - Voluntary Test Method For Thermal Transmittance And Condensation Resistance Of Windows, Doors, And Glazed Wall Sections.
- D. Glass Association of North America (GANA): Glazing manual.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data:
- 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
- C. Selection Samples: Two complete color chip sets representing manufacturer's full range of stocked colors with a standard size of 2 x 3 inches (50 x 75 mm).
- D. Verification Samples: Two representative units of each type, size, color and finish.
- 1. Aluminum Finish: Two samples, minimum size of 2 x 3 inches (50 x 75 mm), representing actual material and color.
 - 2. Wood Finish: Two samples, minimum size of 2 x 5 inches (50 x 127 mm), representing actual product and color.
 - 3. Glazing: Two samples, minimum size of 12 x 12 inches (300 x 300 mm), representing specified glass, including coatings and frit patterns.
 - 4. Assembly Sample: One sample demonstrating connection details with a maximum size of 12 x 12 x 12 inches (305 x 305 x 305 mm). Glazing included as offered by glass supplier. Sample developed to best represent the specified product.
- E. Shop Drawings: Detailed drawings prepared specifically for the project by manufacturer. Include information not fully detailed in manufacturer's standard product data, including, but not limited to wall elevations and detail sections of every typical composite member.
- 1. Show opening dimensions, framed opening tolerances, profiles, product components, anchorages, and accessories.
 - 2. Include details of materials, construction, finish, fastener locations, glazing, hardware arrangements and relationship with adjacent construction.
 - 3. Include schedule identifying each unit, with marks or numbers referencing Drawings.
 - 4. Show surrounding substrates and relevant conditions.
- F. Maintenance Manuals: Manufacturer's maintenance manuals.
- G. Warranty: Manufacturer's warranty online registry.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum twenty (20) years documented experience in fabrication and erection of glass wall systems for projects of similar scope.
 - 1. Manufacturer must use an extruded aluminum system comprised of domestically produced aluminum and is fabricated and assembled in the USA.
 - 2. Manufacturer must be recognized by NAMI.
 - 3. Manufacturer must be a member in good standing of the National Glass Association (NGA).
- B. Installer Qualifications: Company experienced in performing work of this section that has specialized in installation of work similar in scope and complexity required for this project for a minimum of five (5) years.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
 - 1. Intent of mock-up is to demonstrate surface preparation techniques, quality of workmanship and visual appearance.
 - 2. Approximate Size: _____.
 - 3. Refinish mock-up area as required to produce acceptable work.
 - 4. Do not continue with remaining work until workmanship, color, and sheen are approved by Architect.
 - 5. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 - 6. Do not alter or remove mock-up until work is completed or removal is authorized.
 - 7. Retain mock-up during construction as standard for comparison with completed work.
 - 8. Incorporate accepted mock-up as part of the Work.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference, by phone, approximately two weeks before scheduled commencement of the Work. Attendees will include Architect, Contractor and trades involved. Agenda will include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations. Store products in manufacturer's original unopened packaging, covered to protect factory finishes from damage, precipitation, and construction dirt until ready for installation. Store materials off construction grounds in a secure location that is a dry, covered area and protected from weather conditions.
- B. Inspect and report any freight damages to the manufacturer immediately.
- C. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- B. Perform structural silicone sealant work when air temperature is above 10 degrees F (minus 12 degrees C). 40 - 120 degrees F (4 - 49 degrees C) is ideal.

1.9 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard limited warranty against defects in materials and workmanship.
 - 1. Warranty Period for Glass Wall Systems: 10 years for cases of normal use.
 - 2. Warranty Period for Bearing Assemblies: Free from defect for a period of 10 years.
 - 3. Warranty Period for Trolley and Hinge Assemblies: Free from defect for a period of 10 years.
 - 4. Warranty for Frame Finish:
 - a. Anodized Finishes: Provide a warranty of 5 years.
 - b. Stock Color AAMA 2605 Finishes: 2-3 coats powder or liquid dependent on color and/or application, provide paint manufacturer's warranty for color and film integrity for at least 15 years from date of application.
 - c. Custom Color AAMA 2605 Finishes: 2-3 coats powder or liquid dependent on color and/or application, provide paint manufacturer's warranty for color and film integrity for at least 15 years from date of application.
 - d. Stock Color AAMA 2604 Finishes: 2 coats powder or liquid, provide warranty for color and film integrity for 10 years from date of application.
 - e. Custom Color AAMA 2604 Finishes: 2 coats powder or liquid, provide paint manufacturer's warranty for cracking and pulling integrity for 10 years from date of application.
 - f. Custom AAMA 2603 Finishes: 1 coat liquid only, thermosetting acrylic resin finishes, provide warranty for cracking and pulling integrity for 5 years from date of application.
 - g. Stock Color AAMA 2603 Finishes: 1 coat liquid only, provide paint manufacturer's warranty for cracking and pulling integrity for at least 5 years from date of application.
 - h. Custom Warranty Period: ____ years, to be approved and accepted in writing by manufacturer based on project's scope and application.
 - 5. Warranty for Flat Glazing: Provide glazing manufacturer's standard warranty against defective materials, delamination, seal failure, and defects in manufacturing for up to 20 years prorated or as otherwise provided in or limited by the glass manufacturer's limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solar Innovations Architectural Glazing Systems, which is located at: 31 Roberts Rd.; Pine Grove, PA 17963; ASD Toll Free: 800-618-0669; Phone: 570-915-1500; Fax: 800-618-0743; Fax: 570-915-6083; Email: skylight@solarinnovations.com; Web: www.solarinnovations.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements and the following criteria.
 - 1. Structural Calculations: For products specified; stamped by a professional engineer licensed in the state in which the Project is located.

2.2 PERFORMANCE REQUIREMENTS

- A. Air Leakage Performance:
 - 1. Design, fabricate, assemble, and erect the aluminum glazed system to be permanently free of significant air leakage.
 - 2. Significant leakage to be defined as a differential test pressure amounting to 20 percent of specified strength performance pressure required with operable windows

doors, or joints, if any, sealed to prevent crack leakage.

- B. Structural Performance: Structural performance as tested in accordance with ASTM E330; with no glass breakage or permanent damage to fasteners, anchors, hardware, or actuating mechanisms.
1. Normal wall deflection not exceeding 1/175 of clear span for span lengths of 162 inches (4115 mm) or less and 1/240 plus 1/4 inch (6 mm) for others. Restrict deflection to 3/4 inch (19 mm) maximum for individual glazing lites.
 2. Parallel to wall deflection not exceeding 175 percent of glass edge clearance. Restrict deflection to L/360 or 1/8 inch (3 mm) maximum. Restrict deflection to 1/16 inch (1.6 mm) maximum above doors and/or windows. Increasing the deflection to 1/8 inch (3 mm) to be permitted if the unit operation is not affected.
 3. Deflection of the entire assembly, including, but not limited to, glass, not to exceed 1-1/2 inches (38 mm).
- C. Thermal Performance: Tested values, certifications, and simulation protocols.
1. Thermal Characteristics:
 - a. U-Value: ____.
 - b. CRF: ____.
 2. U-Value: Unit complies with U-value, NFRC rating, or simulation in accordance with NFRC 100 protocol, shown in manufacturer's published data for glazing and sill specified.
 3. Solar Heat Gain Coefficient: Unit to comply with the Solar Heat Gain Coefficient NFRC rated, or simulation in accordance with NFRC 200 protocol, shown in manufacturers published data for the glazing and sill specified.
- D. Compliance:
1. Clear Glass Wall System: SI3000C Slide and stack operation/configuration as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Air Performance: Design, fabricate, assemble, and erect the aluminum glazed system to be permanently free of significant air leakage defined as a differential test pressure amounting to 20 percent of specified strength performance pressure required with operable windows doors, or joints, if any, sealed to prevent crack leakage.
 - b. Structural Performance in accordance with ASTM-E330: No glass breakage or permanent damage to fasteners, anchors, hardware, or actuating mechanisms.
 - 1) Normal Wall Deflection: Not to exceed 1/175 of clear span for spans lengths of 13 ft-6 inches (4115 mm) or less and 1/240 plus 1/4 inch (6 mm) for all others. Restrict deflection to 3/4 inch (19 mm) maximum for individual glazing lites.
 - 2) Parallel to wall deflection should not exceed 175 percent of glass edge clearance. Restrict deflection to L/360 or 1/8 inch (3 mm) maximum. Restrict deflection to 1/16 inch (1.5 mm) maximum above doors and/or windows. It shall be permitted to increase the deflection to 1/8 inch (3 mm) if the door operation is not affected.
 - 3) Deflection of the entire assembly, including, but not limited to, glass, shall not exceed 1-1/2 inch (38 mm).
 2. Folding Wall System: SI33350F Impact Infold and/or Outfold Wall System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical size panel folding wall unit size of (W x H) 260.69 x 118.5 inches (6621.5 x 3009.9 mm); panel size of (W x H) 42 x 114 inches (1067 x 2896 mm).
 - a. Testing Results for Wall System: Mid-Wall Double Door Outfold G3 Light Folding Glass Wall; FL Approval No. 13407.6.
 - 1) High Velocity Hurricane Zone Flush Sill Rating (NCTL 110-15327-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.07 cfm per sq ft (21.3 L per min per sq m) infiltration.

- b) Water Penetration Test per ASTM E331: Water pressure of 12.0 psf (574.5 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 50 psf (2394 Pa).
- b. Testing Results for Wall System: Mid-Wall Double Door Infold Folding Glass Wall; FL Approval No. 13407.4.
 - 1) High Velocity Hurricane Zone Flush Sill Rating (NCTL 110-15505-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.09 cfm per sq ft (27.4 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 55 psf (2633 Pa).
 - 2) High Velocity Hurricane Zone Standard Sill Rating (NCTL 110-15327-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.02 cfm per sq ft (6.1 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 70 psf (3352 Pa).
- c. Testing Results for Wall System: Mid-Wall Double Door Outfold Folding Glass Wall; FL Approval No. 13407.5.
 - 1) High Velocity Hurricane Zone Flush Sill Rating (NCTL 110-15505-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.09 cfm per sq ft (27.4 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 55 psf (2633 Pa).
 - 2) High Velocity Hurricane Zone Standard Sill Rating (NCTL 110-15327-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.18 cfm per sq ft (54.9 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 12.0 psf (574.5 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 70 psf (3352 Pa).
- d. Testing Results for Infold Wall System: 90 degree Corner No Post Folding Glass Wall; FL Approval No. 13407.3.
 - 1) High Velocity Hurricane Zone Standard Sill Rating (NCTL 110-15505-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.16 cfm per sq ft (48.8 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 80 psf (3830 Pa).
- e. Testing Results for Infold Wall System: 90 degree Corner No Post Folding Glass Wall; FL Approval No. 13407.2.
 - 1) High Velocity Hurricane Zone Flush Sill Rating (NCTL 110-15505-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.09 cfm per sq ft (27.4 L per min per sq m) infiltration.

- b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 55 psf (2633 Pa).
- 3. Folding Wall System: SI3350 Non-impact Infold and/or Outfold Wall System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical size panel folding wall unit size of (W x H) 223.75 x 100.5 inches (5683 x 2553 mm) - panel size of (W x H) 36 x 96 inches (914 x 2438 mm); and 149.9375 x 100.5 inches (3808.4125 x 2553 mm).
 - a. Testing Results for Infold Wall System: 90 degree Corner No Post Folding Glass Wall; FL Approval No. 12279.3.
 - 1) Flush Sill Rating (NCTL 110-15540-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.08 cfm per sq ft (24 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive 70 psf (2873 Pa) to negative 70 psf (3352 Pa).
 - 2) Standard Sill Rating (NCTL 110-14992-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.05 cfm per sq ft (15.2 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 80 psf (3830 Pa).
 - b. Testing Results for Outfold Wall System: All Wall Folding Glass Wall; FL Approval No. 12279.5.
 - 1) Flush Sill Rating (NCTL 110-15135-1, NCTL 110-15540-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.08 cfm per sq ft (24 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331 and ASTM E547: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive 70 psf (2873 Pa) to negative 70 psf (3352 Pa).
 - 2) Design Pressure with Panic Bar Option: Positive or negative 65 psf (3112 Pa).
 - 2) Standard Sill Rating (NCTL 110-15135-1, NCTL 110-14994-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), less than 0.01 cfm per sq ft (3.0 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331 and ASTM E547: Water pressure of 15.0 psf (718 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 80 psf (3830 Pa).
 - 2) Design Pressure with Panic Bar Option: Positive or negative 65 psf (3112 Pa).
 - c. Testing Results for Wall System: Mid-Wall Double Door Infold Folding Glass Wall; FL Approval No. 12279.4.
 - 1) Flush Sill Rating (NCTL 110-15540-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.08

- cfm per sq ft (24 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive 70 psf (2873 Pa) to negative 70 psf (3352 Pa).
 - 2) Standard Sill Rating (NCTL 110-15005-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.02 cfm per sq ft (6.1 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 12.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 80 psf (3830 Pa).
- d. Testing Results for Wall System: Mid-Wall Double Door Outfold Folding Glass Wall; FL Approval No. 12279.6.
 - 1) Flush Sill Rating (NCTL 110-15540-1, NCTL 110-15135-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.08 cfm per sq ft (24 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive 70 psf (2873 Pa) to negative 70 psf (3352 Pa).
 - 2) Design Pressure with Panic Bar Option: Positive or negative 65 psf (3112 Pa).
 - 2) Standard Sill Rating (NCTL 110-15540-1, NCTL 110-15005-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.02 cfm per sq ft (6.1 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 12.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 80 psf (3830 Pa).
 - 2) Design Pressure with Panic Bar Option: Positive or negative 65 psf (3112 Pa).
- e. Testing Results for Infold Wall System: Radius Folding Glass Wall; FL Approval No. 12279.7.
 - 1) Flush Sill Rating (NCTL 110-15540-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.08 cfm per sq ft (24 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 70 psf (3352 Pa).
 - 2) Standard Sill Rating (NCTL 110-15540-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.08 cfm per sq ft (24 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive 70 psf (2873 Pa) to negative 70

psf (3352 Pa).

4. Folding Wall System: SI33350 Non-impact Infold and/or Outfold Wall System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical size panel folding wall unit size of (W x H) 260.69 x 118.5 inches (6622 x 30010 mm); panel size of (W x H) 42 x 114 inches (1067 x 2896 mm).
 - a. Testing Results for Wall System: 90 degree Corner No Post Folding Glass Wall; FL Approval No. 14399.2.
 - 1) Standard Sill Rating (NCTL 110-15505-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.16 cfm per sq ft (48.8 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive 90 PSF, negative 80 PSF.
 - b. Testing Results for Wall System: 90 degree Corner No Post Folding Glass Wall; FL Approval No. 14399.1.
 - 1) Flush Sill Rating (NCTL 110-15505-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.09 cfm per sq ft (27.4 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330
 - 1) Design Pressure: Positive or negative 55 psf (2633 Pa).
 - c. Testing Results for Wall System: Mid-Wall Double Door Outfold Folding Glass Wall; FL Approval No. 14399.3.
 - 1) Flush Sill Rating (NCTL 110-15327-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.07 cfm per sq ft (21.3 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 12.0 psf (574.5 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 50 psf (2394 Pa).
 - d. Testing Results for Wall System: Mid-Wall Double Door Infold Folding Glass Wall; FL Approval No. 14399.4.
 - 1) Flush Sill Rating (NCTL 110-15505-1).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.09 cfm per sq ft (27.4 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 55 psf (2633 Pa).
 - 2) Standard Sill Rating (NCTL 110-15327-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.02 cfm per sq ft (6.1 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 70 psf (3352 Pa).
 - e. Testing Results for Wall System: Mid-Wall Double Door Outfold Folding Glass Wall; FL Approval No. 14399.5.
 - 1) Flush Sill Rating (NCTL 110-15505-1).

- a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.09 cfm per sq ft (27.4 L per min per sq m) infiltration.
- b) Water Penetration Test per ASTM E331: Water pressure of 9.0 psf (431 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
- c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 55 psf (2633 Pa).
- 2) Standard Sill Rating (NCTL 110-15327-2).
 - a) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.18 cfm per sq ft (54.9 L per min per sq m) infiltration.
 - b) Water Penetration Test per ASTM E331: Water pressure of 12.0 psf (574.5 Pa) at 5.0 gal per hour per sq ft (204 L per hour per sq m), no leakage.
 - c) Structural testing per ASTM E330:
 - 1) Design Pressure: Positive or negative 70 psf (3352 Pa).
- 5. Stacking Wall System: SI3350S Wall System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical four panel folding wall unit size of (W x H) 144 x 96 inches (3658 x 2438 mm); panel size of (W x H) 34.06 x 90.44 inches (865 x 2297 mm).
 - a. Testing Results for Wall System: Stacking Glass Wall; Non-Impact FL Approval No. 12279.9
 - 1) Air Infiltration Test per ASTM E283: Force of 1.6 psf (75 Pa), 0.25 cfm per sq ft (76.2 L per min per sq m) infiltration.
 - 2) Uniform Structural Load Test per ASTM E330
 - a) Positive design pressure: 40 psf (1915 Pa)
 - b) Negative design pressure: 40 psf (1915 Pa)

2.3 GLASS WALL SYSTEMS

A. Glass Wall Systems:

1. Basis of Design: SI3250N G2 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, narrow non-thermal extruded aluminum frame 1.813 inches (46.08 mm) width.
2. Basis of Design: SI3250 G2 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, narrow thermal extruded aluminum frame with a thermal isolation separation 1.813 inches (46.08 mm) width.
3. Basis of Design: SI3350N G2 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, standard non-thermal extruded aluminum frame 2.75 inches (69.85 mm) width.
4. Basis of Design: SI3350 G2 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, standard thermal extruded aluminum frame with a thermal isolation separation 2.75 inches (69.85 mm) width.
5. Basis of Design: SI3600 G2 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, heavy thermal extruded aluminum frame with a thermal isolation separation 5.5 inches (139.7 mm) width.
6. Basis of Design: SI32350F G3 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, narrow thermal extruded aluminum frame with a thermal isolation separation 1.81 inches (45.97 mm) width.
7. Basis of Design: SI33350NF G3 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, regular non-thermal extruded aluminum frame 2.75 inches (69.85 mm) width.
8. Basis of Design: SI33350F G3 folding wall system as manufactured by Solar Innovations Architectural Glazing Systems, regular thermal extruded aluminum frame with a thermal isolation separation 2.75 inches (69.85 mm) width.
9. Basis of Design: SI33350NF G3 light folding glass wall system as manufactured by Solar Innovations Architectural Glazing Systems, regular non-thermal extruded

- aluminum frame with a thermal isolation separation, 2.75 inches (69.85 mm) width.
10. Basis of Design: SI33350F G3 light folding glass wall system as manufactured by Solar Innovations Architectural Glazing Systems, regular thermal extruded aluminum frame with a thermal isolation separation, 2.75 inches (69.85 mm) width.
 11. Basis of Design: SI3250NS G2 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, narrow non-thermal extruded aluminum frame 1.813 inches (46.08 mm) width.
 12. Basis of Design: SI3250S G2 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, narrow thermal extruded aluminum frame with a thermal isolation separation 1.813 inches (46.08 mm) width.
 13. Basis of Design: SI3350NS G2 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, standard non-thermal extruded aluminum frame 2.75 inches (69.85 mm) width.
 14. Basis of Design: SI3350S G2 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, standard thermal extruded aluminum frame with a thermal isolation separation 2.75 inches (69.85 mm) width.
 15. Basis of Design: SI3600S G2 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, heavy thermal extruded aluminum frame with a thermal isolation separation 5.5 inches (139.7 mm) width.
 16. Basis of Design: SI32350ST G3 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, narrow non- thermal extruded aluminum frame with a thermal isolation separation 1.81 inches (45.97 mm) width.
 17. Basis of Design: SI33350NST G3 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, regular non-thermal extruded aluminum frame 2.75 inches (69.85 mm) width.
 18. Basis of Design: SI33350ST G3 stacking wall system as manufactured by Solar Innovations Architectural Glazing Systems, regular thermal extruded aluminum frame with a thermal isolation separation 2.75 inches (69.85 mm) width.
 19. Basis of Design: SI3000C clear wall system as manufactured by Solar Innovations Architectural Glazing Systems; stack and sliding with non-thermal extruded aluminum frame 1.5 inches (38.10 mm) width.
 20. Basis of Design: As scheduled and indicated on Drawings.
 21. Framing Members Thickness: As indicated on Drawings.
 22. Framing Members Thickness: Minimum .125 inch (3.2 mm) wall thickness for structural members.
 23. Framing Members Thickness: Thickness as determined by manufacturer based on design loading, cross sectional configuration, and fabrication requirements.
 24. Load Bearing: As indicated on Drawings.
 25. Load Bearing: Top load bearing system.
 26. Load Bearing: Bottom load bearing system.
 27. Operation: Out-folding system.
 28. Operation: In-folding system.
 29. Operation: Slide and stack.
 30. Operation: As indicated on Drawings.
 31. Configuration: As indicated on Drawings.
 32. Configuration: Custom, _____.
 33. Configuration: For folding wall systems, all wall.
 34. Configuration: For folding wall systems, center pivot.
 35. Configuration: For folding wall systems, double door.
 36. Configuration: For folding wall systems, split wall.
 37. Configuration: For folding wall systems, single door.
 38. Configuration: For folding wall systems, 135 degrees no post.
 39. Configuration: For folding wall systems, 90 degrees no post.
 40. Configuration: For folding wall systems, segmented radius.
 41. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, straight wall 60 degrees parallel stack.

42. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, straight wall 60 degrees parallel stack with integrated door panel.
43. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, straight wall 60 degrees parallel stack with fixed door panel.
44. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, split wall 60 degrees parallel stack.
45. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, segmented radius 60 degrees perpendicular stack.
46. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, segmented radius 60 degrees parallel stack.
47. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, no post corner 60 degrees perpendicular stack.
48. Configuration: For slide and stack wall systems and clear glass wall systems, 60 degrees offset stack individual panel, no post corner 60 degrees parallel stack.
49. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall parallel stack.
50. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall perpendicular stack.
51. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall parallel stack with fixed door panel.
52. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall perpendicular stack with fixed door panel.
53. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall parallel stack with integrated door panel.
54. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall perpendicular stack with integrated door panel.
55. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall remote stack perpendicular stack with integrated door panel.
56. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, segmented radius wall parallel stack.
57. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, segmented radius wall perpendicular stack.
58. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, straight wall parallel remote stack.
59. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, offset wall parallel remote multiple stack.
60. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, corner wall perpendicular remote stack.
61. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees offset stack individual panels, corner wall perpendicular stack.
62. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees center hung hinged pairs, straight wall perpendicular stack.
63. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees center hung hinged pairs, offset wall perpendicular stack.
64. Configuration: For slide and stack wall systems and clear glass wall systems, 90 degrees center hung hinged pairs, segmented radius wall perpendicular stack.
65. Panel Size: As indicated on Drawings.
66. Panel Size:

- a. Width _____.
 - b. Height _____.
67. Mullions: Narrow mullion, 2-5/8 inches (67 mm) for G2 wall systems.
 68. Mullions: Standard mullion, 3-1/2 inches (89 mm) for G2 wall systems.
 69. Mullions: Wide mullion, 6 inches (152 mm) for G2 wall systems.
 70. Mullions: Xtra Narrow mullion, 3-1/8 inches (79 mm) for G3 folding glass walls.
 71. Mullions: G3 Terrace Door mullion, 3-5/16 inches (84 mm) for G3 wall systems.
 72. Mullions: G3 Mullion 275, 4-1/4 inches (108 mm) for G3 wall systems.
 73. Mullions: As indicated on Drawings.
 74. Glazing Accessories:
 - a. Type: As indicated on Drawings.
 - b. Type: Decorative mullions.
 - c. Type: Interior grids, 3/16 inch x 5/8 inch (4.76 mm x 15.87 mm).
 - d. Type: Simulated divided lites, 3/8 inch x 5/8 inch (9.52 mm x 15.87 mm).
 - e. Type: Applied grids, 3/4 inch (19 mm) low profile grid.
 - f. Type: Applied grids, 3/4 inch (19 mm) traditional grid.
 - g. Type: Applied grids, 1-1/4 inch (32 mm) traditional grid.
 - h. Type: Applied grids, 7/8 inch (22 mm) colonial grid.
 - i. Type: Applied grids, 7/8 inch (22 mm) ogee grid.
 - j. Type: Interior muntin grid on insulated glazing.
 - k. Type: Interior and exterior applied grids with simulated divided lites (SDL), low profile grid.
 - l. Type: Interior and exterior applied grids with simulated divided lites (SDL), Ogee grid.
 - m. Type: Interior and exterior applied grids with simulated divided lites (SDL), traditional grid.
 - n. Type: Interior and exterior applied grids with simulated divided lites (SDL), 1-1/4 inch (32 mm) traditional grid.
 - o. Type: Interior and exterior applied grids, arched grid.
 - p. Type: Interior and exterior applied grids, gothic grid.
 - q. Type: Interior and exterior applied grids, double gothic grid.
 - r. Type: Interior and exterior applied grids, English grid.
 - s. Type: Interior and exterior applied grids, traditional grid.
 - t. Type: Interior and exterior applied grids, cross grid.
 - u. Type: Decorative raised panels.
 75. Screens:
 - a. Type: As indicated on Drawings.
 - b. Type: SI1000 Fixed screens as manufactured by Solar Innovations Architectural Glazing Systems.
 - c. Type: SI1000 Operable screens as manufactured by Solar Innovations Architectural Glazing Systems.
 - d. Type: SI1000 B-Series Horizontally Retractable Screen System as manufactured by Solar Innovations Architectural Glazing Systems.
 - e. Type: SI1000 C-Series Centor SIE Horizontally Retractable Eco-Screen System as manufactured by Solar Innovations Architectural Glazing Systems.
 - f. Type: SI1000 S-Series Motorized SC4500 Mastershade Vertically Retractable Screen System as manufactured by Solar Innovations Architectural Glazing Systems.
 - g. Framing: Aluminum, 1 x 1 inch (25 x 25 mm).
 - h. Screen Materials: As indicated on the Drawings.
 - i. Screen Materials: Standard gray colored charcoal.
 - j. Screen Materials: Fiberglass.
 - k. Screen Materials: Aluminum.
 - l. Screen Materials: Custom pet screens.
 - m. Screen Materials: Black Tuffscreen mesh.
 - n. Size: As indicated on the Drawings.

- o. Size: _____.
- p. Mounting and Configuration: As indicated on Drawings.
- 76. Perimeter Weather Gaskets: EPDM with solid strand cord.
- 77. Sills: Standard sill.
- 78. Sills: Standard recessed sill.
- 79. Sills: Standard flush recessed sill.
- 80. Sills: Recessed ramp sill (ADA).
- 81. Sills: Top load only, ADA surface mount sill.
- 82. Sills: Top load only, surface mount sill.
- 83. Sills: Top load only, recessed flush hat sill.
- 84. Sills: Top load only, ADA recessed flush hat sill.
- 85. Sills: Dust proof floor strikes, aluminum.
- 86. Sills: Tank sill, with drain tube available.
- 87. Sills: Tank sill with ADA ramps, with drain tube available.
- 88. Sills: ADA surface mount sill.
- 89. Sills: Surface mount sill.
- 90. Sills: Recessed flush hat sill.
- 91. Sills: Sill fillers, in locations as approved by manufacturer.
- 92. Sills: Top load only, ADA recessed flush hat sill.
- 93. Sills: As indicated on Drawings.
- 94. Drain Tubes: Factory fabricated. top load only. Field fabricated drain tubes are not acceptable.

B. Hardware:

- 1. For Folding or Slide and Stack Glass Wall Systems:
 - a. Handles: As scheduled and indicated on Drawings.
 - b. Handles: Standard Toronto style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Matte black.
 - 3) Finish: White.
 - 4) Finish: Satin Nickel.
 - c. Handles: Standard Allegro style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Black.
 - 3) Finish: White.
 - 4) Finish: Satin chrome.
 - d. Handles: Aluminum, Frankfurt style, for inland applications.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Pure Silver.
 - 3) Finish: Pure white.
 - e. Handles: Aluminum, London style, for inland applications.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Pure Silver.
 - 3) Finish: Pure white.
 - f. Handles: Brass, Capri style, for inland applications.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Satin chrome.
 - 3) Finish: Polished chrome.
 - 4) Finish: Polished brass.
 - 5) Finish: Antique brass.
 - 6) Finish: Dark bronze.
 - 7) Finish: Pewter.
 - 8) Finish: White.
 - 9) Finish: Black.
 - g. Handles: Brass, Venice style, for inland applications.
 - 1) Finish: As scheduled and indicated on Drawings.

- 2) Finish: Satin chrome.
- 3) Finish: Polished chrome.
- 4) Finish: Polished brass.
- 5) Finish: Antique brass.
- 6) Finish: Dark bronze.
- 7) Finish: Pewter.
- 8) Finish: White.
- 9) Finish: Black.
- h. Handles: Solid brass, Rodos style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Polished chrome.
 - 3) Finish: Oil rubbed brass.
 - 4) Finish: Brushed chrome.
 - 5) Finish: Rustic umber.
 - 6) Finish: White.
 - 7) Finish: Matte black.
 - 8) Finish: Satin Nickel.
 - 9) Finish: Brass.
 - 10) Finish: Antique Nickel.
- i. Handles: Solid brass, Verona style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Polished chrome.
 - 3) Finish: Oil rubbed brass.
 - 4) Finish: Brushed chrome.
 - 5) Finish: Rustic umber.
 - 6) Finish: White.
 - 7) Finish: Matte black.
 - 8) Finish: Satin Nickel.
 - 9) Finish: Brass.
 - 10) Finish: Antique Nickel.
- j. Handles: Solid brass, Munchen style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Polished chrome.
 - 3) Finish: Oil rubbed brass.
 - 4) Finish: Brushed chrome.
 - 5) Finish: Rustic umber.
 - 6) Finish: White.
 - 7) Finish: Matte black.
 - 8) Finish: Satin Nickel.
 - 9) Finish: Brass.
 - 10) Finish: Antique Nickel.
- k. Handles: Solid brass, New Orleans style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Polished chrome.
 - 3) Finish: Oil rubbed brass.
 - 4) Finish: Brushed chrome.
 - 5) Finish: Rustic umber.
 - 6) Finish: White.
 - 7) Finish: Matte black.
 - 8) Finish: Satin Nickel.
 - 9) Finish: Brass.
 - 10) Finish: Antique Nickel.
- l. Handles: Solid brass, Dallas style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Polished chrome.
 - 3) Finish: Oil rubbed brass.

- 4) Finish: Brushed chrome.
- 5) Finish: Rustic umber.
- 6) Finish: White.
- 7) Finish: Matte black.
- 8) Finish: Satin Nickel.
- 9) Finish: Brass.
- 10) Finish: Antique Nickel.
- m. Pulls: Type and finish as scheduled and indicated on Drawings.
- n. Pulls: Low profile handle.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- o. Pulls: Recessed pulls for in-fold operation.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- p. Pulls: Wire pulls for out-fold operation.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- q. Hinges: As scheduled and indicated on Drawings.
- r. Hinges: Surface mount aluminum hinge with stainless steel bushings and security bolt end; 7-knuckle, aluminum and stainless steel, corrosion proof, Zinc-die-cast hinges not acceptable.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- s. Hinges: Semi-concealed aluminum hinge with stainless steel bushings and security bolt end; 7-knuckle, aluminum and stainless steel, corrosion proof, Zinc-die-cast hinges not acceptable.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- t. Locks: Type and finish as scheduled and indicated on Drawings.
- u. Locks: Two point locking handle.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.

- v. Locks: Two point keyed lock.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- w. Locks: Thumb turn lock.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- x. Locks: Flush bolt.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- y. Closers: As scheduled and indicated on Drawings.
- z. Closers: D Series 7414 top mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
- aa. Closers: D Series TS93 top mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
- bb. Closers: C Series PR82 top mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
- cc. Closers: D Series BTS80 floor mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
- dd. Closers: R Series H28S floor mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
- ee. Adjustable Door Catches:
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: White.
 - 3) Finish: Bronze.
 - 4) Finish: Class 1 clear anodized.
 - 5) Finish: Dark bronze anodized.
- ff. Door Limiters: In locations as scheduled and indicated on Drawings.
- gg. Commercial Panic Hardware: As scheduled and indicated on Drawings.
- hh. Commercial Panic Hardware: None.

- ii. Commercial Panic Hardware: Exterior entry trim, square style.
 - jj. Commercial Panic Hardware: Mortise panic.
 - kk. Commercial Panic Hardware: Impact panic.
 - ll. Commercial Panic Hardware: Push/pull.
 - mm. Commercial Panic Hardware: Push only.
 - nn. Passive Hardware: As scheduled and indicated on Drawings.
 - oo. Passive Hardware: None.
 - pp. Passive Hardware: Square style for commercial applications.
 - qq. Passive Hardware: Toronto style.
2. For Clear Glass Wall Systems:
- a. Closers: As scheduled and indicated on Drawings.
 - b. Closers: D Series 7414 top mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
 - c. Closers: D Series TS93 top mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
 - d. Closers: C Series PR82 top mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
 - e. Closers: D Series BTS80 floor mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
 - f. Closers: R Series H28S floor mounted door closer.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Mill finish aluminum.
 - 3) Finish: Painted black.
 - 4) Finish: Painted bronze.
 - g. Adjustable Door Catches:
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: White.
 - 3) Finish: Bronze.
 - 4) Finish: Class 1 clear anodized.
 - 5) Finish: Dark bronze anodized.
 - h. Door Limiters: In locations as scheduled and indicated on Drawings.
 - i. Handles: As scheduled and indicated on Drawings.
 - j. Handles: Handle notch in glazing.
 - k. Handles: Swing door handles for integrated doors in slide and stack systems.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: Natural aluminum.
 - 4) Finish: Satin stainless steel.
 - l. Handles: Glass mounted pull handles for sliding systems.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: Black.
 - 4) Finish: White.
 - 5) Finish: Satin chrome.

- m. Hinges: As scheduled and indicated on Drawings.
- n. Hinges: Clear FGW hinges.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Custom, _____.
 - 3) Finish: White.
 - 4) Finish: Bronze.
 - 5) Finish: Class 1 clear anodized.
 - 6) Finish: Dark bronze anodized.
- o. Bottom Locks: As scheduled and indicated on Drawings.
- p. Bottom Locks: Thumbturn locks.
- q. Bottom Locks: Keyed locks.
- 3. Stainless Steel Bearings: With eight rollers which can be serviced without being removed from their track system.
- 4. Stainless Steel Bearings: With rollers which can be serviced without being removed from their track system.
- 5. Fasteners: For applications in locations as approved by manufacturer.
- 6. Locking Rods: Concealed stainless steel locking rods; aluminum locking rods not acceptable.
- 7. Corners:
 - a. Corner Lugs: Extruded aluminum, with thermal break.
 - b. Corner Connectors: With thermal break.
- 8. End Caps: Do not breach thermal break.

C. Materials:

- 1. Aluminum Flashing and Closures:
 - a. Alloy and Temper: 6063-T52, 6063-T6, or 6061-T6.
 - b. Sheet Aluminum Finish: Matching system components.
 - c. Thickness: Minimum 0.040 inch (1 mm) thick.
 - d. Attachment: Secured with concealed fastening method or fastener with head finished to match system components.
 - e. Snap-on Covers and Miscellaneous Non-Structural Trim: Minimum thickness as recommended by manufacturer.
- 2. Insulation: Expanded polystyrene insulation at filler panels and sheet metal members.
- 3. Thermal Breaks: Thermal Insulbar Separation, manufacturer's standard system to provide thermal separation between exterior and interior components.
- 4. Internal Reinforcing: Structural aluminum complying with ASTM B221 and ASTM B241.
- 5. Structural Glazing Sealant: Manufacturer's standard, black.
- 6. Perimeter Sealant: As indicated on Drawings.
- 7. Perimeter Sealant: Manufacturer's standard, color to match framing finish.
- 8. Perimeter Sealant: Manufacturer's standard, color as selected from manufacturer's standard range.
- 9. Glazing: Single pane, 3/16 inch (5 mm) float glass.
- 10. Glazing: Single pane, 1/4 inch (7 mm) float glass.
- 11. Glazing: Single pane, 1/2 inch (12 mm) float glass.
- 12. Glazing: Single pane, polycarbonate.
- 13. Glazing: Single pane, _____.
- 14. Glazing: Single pane. As indicated on Drawings.
- 15. Glazing: Double pane glazing, 1 inch (25 mm) insulated glass unit.
 - a. Outboard Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 272 low-emissivity coating on surface two.
 - 1) Visible Light Transmittance: 72 percent.
 - 2) Solar Heat Gain Coefficient: 0.41.
 - b. Outboard Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 366 low-emissivity coating on surface two.
 - 1) Visible Light Transmittance: 65 percent.

- 2) Solar Heat Gain Coefficient: 0.27.
- c. Outboard Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 340 low-emissivity coating on surface two.
 - 1) Visible Light Transmittance: 39 percent.
 - 2) Solar Heat Gain Coefficient: 0.18.
- d. Outboard Glazing Lites: As indicated on Drawings.
- e. Vertical Inboard Glazing Lites: 3/16 inch (5 mm) tempered clear glass.
- f. Air Spacers: Stainless steel spacer with dual seals of polyisobutylene/silicone and filled with argon gas.
- 16. Glazing: Specialty, thermochromic glass.
- 17. Glazing: Specialty, Solera light diffusion glazing system.
- 18. Glazing: Specialty, Lumira polycarbonate filled polycarbonate panels.
- 19. Glazing: Decorative, _____.
- 20. Glazing: Decorative, Pattern 62.
- 21. Glazing: Decorative, single glue chip.
- 22. Glazing: Decorative, glue chip.
- 23. Glazing: Decorative, English reeded.
- 24. Glazing: Decorative, satin/acid etch.
- 25. Glazing Gaskets: Compatible with glazing sealant.
 - a. Compliance: ASTM C864.
 - b. Design Compression type, replaceable, EPDM gaskets; with and without solid strand cord to prevent shrinkage.
 - c. Color: Manufacturer's standard, black.
 - d. Corners: Factory molded corners required at interior.
- 26. Setting Blocks, Edge Blocks, and Spacers: As recommended by manufacturer and compatible with insulated glass.
- 27. Gaskets: As indicated on Drawings.
- 28. Gaskets: Clear wall slider gasket, translucent silicone, for sliding clear glass wall systems.
- 29. Gaskets: U with 90 degrees vinyl finseal, translucent PVC, for sliding clear glass wall systems.
- 30. Gaskets: H Clear wall seal, translucent PVC, for folding clear glass wall systems.
- 31. Gaskets: 0.5 Glazing clear wall gasket track, black PVC, for folding clear glass wall systems and slide and stack clear glass wall systems.
- 32. Gaskets: 0.5 Glazing clear wall gasket track, gray PVC, for folding clear glass wall systems and slide and stack clear glass wall systems.
- 33. Gaskets: 9/16 inch (14.3 mm) clear wall gasket, translucent silicone, for slide and stack clear glass wall systems.
- 34. Gaskets: H Clear wall seal, translucent PVC, for slide and stack clear glass wall systems
- 35. Fasteners: Aluminum and stainless steel, not causing electrolytic action or corrosion.
- 36. Fasteners: Zinc Cadmium-plated, acceptable in locations as approved by manufacturer.
- 37. Finish for Exposed Fasteners: To match finish of aluminum frame.

D. Finishes:

- 1. Aluminum Wall Frames: As scheduled and indicated on Drawings.
- 2. Aluminum Wall Frames: Dual color, as indicated on Drawings.
- 3. Aluminum Wall Frames: Dual finish, as indicated on Drawings.
- 4. Aluminum Wall Frames: Mill finish, unfinished.
- 5. Aluminum Wall Frames: Manufacturer's standard white stock finish, AAMA 2603.
- 6. Aluminum Wall Frames: Manufacturer's standard bronze stock finish, AAMA 2603.
- 7. Aluminum Wall Frames: Manufacturer's standard clear anodized finish, Class I AAMA 611.
- 8. Aluminum Wall Frames: Manufacturer's standard dark bronze anodized, Class 1 AAMA 611.

9. Aluminum Wall Frames: Manufacturer's Designer black finish, AAMA 2603.
10. Aluminum Wall Frames: Manufacturer's Designer sandstone finish, AAMA 2603.
11. Aluminum Wall Frames: Manufacturer's Designer natural clay finish, AAMA 2603.
12. Aluminum Wall Frames: Manufacturer's Designer Hartford green finish, AAMA 2603.
13. Aluminum Wall Frames: Copper cladding.
14. Aluminum Wall Frames: Lead coated copper cladding.
15. Aluminum Wall Frames: 304 stainless steel cladding with No. 4 satin finish.
16. Aluminum Wall Frames: 304 stainless steel cladding with No. 8 mirror finish.
17. Aluminum Wall Frames: Powder coating solids finish, bone white, AAMA 2604.
18. Aluminum Wall Frames: Powder coating solids finish, fashion gray, AAMA 2604.
19. Aluminum Wall Frames: Powder coating solids finish, colonial gray, AAMA 2604.
20. Aluminum Wall Frames: Powder coating solids finish, military light blue, AAMA 2604.
21. Aluminum Wall Frames: Powder coating solids finish, burgundy, AAMA 2604.
22. Aluminum Wall Frames: Powder coating solids finish, charcoal, AAMA 2604.
23. Aluminum Wall Frames: Powder coating solids finish, bone white, AAMA 2605.
24. Aluminum Wall Frames: Powder coating solids finish, fashion gray, AAMA 2605.
25. Aluminum Wall Frames: Powder coating solids finish, colonial gray, AAMA 2605.
26. Aluminum Wall Frames: Powder coating solids finish, military light blue, AAMA 2605.
27. Aluminum Wall Frames: Powder coating solids finish, burgundy, AAMA 2605.
28. Aluminum Wall Frames: Powder coating solids finish, charcoal, AAMA 2605.
29. Aluminum Wall Frames: Powder coating metallics finish, champagne, AAMA 2604.
30. Aluminum Wall Frames: Powder coating metallics finish, cosmic gray, AAMA 2604.
31. Aluminum Wall Frames: Powder coating metallics finish, light bronze, AAMA 2604.
32. Aluminum Wall Frames: Powder coating metallics finish, copper, AAMA 2604.
33. Aluminum Wall Frames: Powder coating metallics finish, champagne, AAMA 2605.
34. Aluminum Wall Frames: Powder coating metallics finish, cosmic gray, AAMA 2605.
35. Aluminum Wall Frames: Powder coating metallics finish, light bronze, AAMA 2605.
36. Aluminum Wall Frames: Powder coating metallics finish, copper, AAMA 2605.
37. Aluminum Wall Frames: Acacia 1001, Light DS 716 textured faux wood finish.
38. Aluminum Wall Frames: Acacia 1001, Light DS 402 smooth faux wood finish.
39. Aluminum Wall Frames: Acacia 1001, Dark DS 733 textured faux wood finish.
40. Aluminum Wall Frames: Acacia 1001, Dark DS 403 smooth faux wood finish.
41. Aluminum Wall Frames: Douglas fir 1501 DS 716 textured faux wood finish.
42. Aluminum Wall Frames: Douglas fir 1501 DS 402 smooth faux wood finish.
43. Aluminum Wall Frames: Cherry 1402 DS 716 textured faux wood finish.
44. Aluminum Wall Frames: Cherry 1402 DS 402 smooth faux wood finish.
45. Aluminum Wall Frames: Knotty pine 2103 DS 716 textured faux wood finish.
46. Aluminum Wall Frames: Knotty pine 2103 DS 402 smooth faux wood finish.
47. Aluminum Wall Frames: Cherry 1402 DS 733 textured faux wood finish.
48. Aluminum Wall Frames: Cherry 1402 DS 403 smooth faux wood finish.
49. Aluminum Wall Frames: Oak assi 2501 DS 733 textured faux wood finish.
50. Aluminum Wall Frames: Oak assi 2501 DS 403 smooth faux wood finish.
51. Aluminum Wall Frames: Dark walnut 1802 DS 733 textured faux wood finish.
52. Aluminum Wall Frames: Dark walnut 1802 DS 403 smooth faux wood finish.
53. Aluminum Wall Frames: Teak 2601 DS 706 textured mahogany faux wood finish.
54. Aluminum Wall Frames: National walnut 1806 DS 706 textured mahogany faux wood finish.
55. Aluminum Wall Frames: White oak wood veneering.
56. Aluminum Wall Frames: Red oak wood veneering.
57. Aluminum Wall Frames: Birch wood veneering.
58. Aluminum Wall Frames: Hard maple wood veneering.
59. Aluminum Wall Frames: White ash wood veneering.
60. Aluminum Wall Frames: Cherry wood veneering.
61. Aluminum Wall Frames: Walnut wood veneering.
62. Aluminum Wall Frames: Sapele Mahogany wood veneering.
63. Aluminum Wall Frames: Southern yellow pine wood veneering.

64. Aluminum Wall Frames: Northern white pine wood veneering.
65. Aluminum Wall Frames: Spanish cedar wood veneering.
66. Aluminum Wall Frames: Western red cedar wood veneering.
67. Aluminum Wall Frames: Douglas fir wood veneering.
68. Aluminum Wall Frames: White maple wood veneering.
69. Aluminum Screen Frames: Finish as indicated on Drawings.
70. Aluminum Screen Frames: _____.
71. Aluminum Screen Frames: Finish to match frames.
72. Wood Veneer Finish: As indicated on Drawings.
73. Wood Veneer Finish: Unfinished.
74. Wood Veneer Finish: Manufacturer's standard water based sealer, ICA 3-coat clear, consisting of impregnating agent, base coat, and top coat.

E. Fabrication:

1. Fabricate components in accordance with approved Shop Drawings.
2. Major fabrication must done at the manufacturing location.
3. Install gaskets and tapes at factory.
4. Disassemble only to the extent necessary for shipping and handling limitations.
5. Manufacturer is to be notified of any field modification prior to the activity commencing.
6. Welding is to comply with standards set forth by the American Welding Society.
7. Factory-grind exposed welds smooth and flush with adjacent surfaces prior to finish application; restore mechanical finish.
8. Isolation membrane materials to be used to separate dissimilar metals to prevent galvanic corrosion/action between materials.
9. Fabricate components to allow for accurate and rigid fit of joints and corners. Match components carefully ensuring continuity of line and design. Ensure joints and connections will be flush and weather tight. Ensure slip joints make full, tight contact and are weathertight.
10. Fabricate components true to detail and free from defects impairing appearance, strength or durability.
11. Provide contoured exterior horizontal or purlin glazing retainers to minimize water, ice, and snow buildup.
12. Fabricate with removable sill and head stop.
13. Reinforce components at anchorage and support points, joints, and attachment points for interfacing work.
14. Accurately size glazing to fit openings allowing for clearances as set forth by the "Glazing Manual" published by the Glass Association of North America (GANA).
15. Cut glass clean and carefully. Nicks and damaged edges will not be accepted. Replace glass with damaged edges.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare substrates in strict accordance with the approved Shop Drawings, using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Thoroughly clean surfaces and substrates prior to installation.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. Verify the structural integrity of the header such that the maximum deflection with both the live and dead loads is limited to be less than 1/8 inch (3 mm). Provide structural support for lateral wind loading. A maximum vertical deflection of greater than 1/8 inch (3 mm) per

request may be allowable if accepted by manufacturer. Any deflections larger than 1/8 inch (3 mm) that is requested must be reevaluated and analyzed for engineering approval.

- D. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
 - 1. Separate dissimilar materials using nonconductive tape, paint, or other material not visible in finished work.
 - 2. Provide attachments and shims to permanently fasten system to building structure.
 - 3. Maintain dimensional tolerances and alignment with adjacent work.
 - 4. Anchor securely in place, allowing for required movement, including but limited to expansion and contraction.
 - 5. Install glazing sealants in accordance with manufacturer's instructions, including but not limited to surface preparations.
 - 6. Set sill members in bed of sealant. Set other members with internal sealants to provide weather tight construction.
 - 7. Install flashings, bent metal closures, corners, gutters, and other accessories as detailed on Shop Drawings and required for complete installation.
 - 8. Clean surfaces and install sealant in accordance with sealant manufacturer's instructions and guidelines.

3.3 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
- B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.4 TESTING AND ADJUSTING

- A. Adjust hinge set, locksets, and other hardware for proper operation.
- B. Lubricate using a manufacturer approved lubricant compatible with frame coatings.

3.5 CLEANING AND PROTECTION

- A. Clean and protect products in accordance with the manufacturer's recommendations.
 - 1. Remove temporary coverings and protection of adjacent work areas.
 - 2. Clean and dress sealant prior to installation completion.
 - 3. Clean glass prior to installation completion.
 - 4. Clean the entire enclosure one time at the completion of the installation. Cleaning to include surface cleaning of aluminum framing and glass and cleanup of construction debris.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
 - 1. Areas with Abraded Surface Finish: Clean and touch-up with air dry paint, as approved and furnished by window manufacturer, color to match factory applied finish.

END OF SECTION