

SOLAR INNOVATIONS.

SECTION 08433 (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 folding glass wall systems.
- D. Clear stacking 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 22 00 – Concrete 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 60 00 - Flashing and Sheet Metal.
- I. Section 07 90 00 - Joint Protection.
- J. Section 08 00 00 – Glazing.
- K. Section 08 70 00 – Hardware.

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 E90- Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 6. 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.
 7. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, 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.
 12. ASTM F588: Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- 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. Florida Building Code (FBC):
1. TAS 201: Impact Test Procedures.
 2. TAS 202: Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressures.
 3. TAS 203: Criteria for Testing Products Subjected to Cyclic Pressure Loading.
- E. Texas Department of Insurance (TDI): Product Evaluations.
- F. Glass Association of North America (GANA): Glazing manual.
- G. National Fenestration Rating Council (NFRC):
1. NFRC 100: Procedure for Determining Fenestration Product U-factors.
 2. NFRC 102: Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
 3. NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence.
 4. NFRC 400: Procedure for Determining Fenestration Product Air Leakage.
 5. NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values.
- H. Window and Door Manufacturer's Association (WDMA): AAMA/WDMA/CSA 101/I.S.2/A440 - Windows, Skylights and Glass Doors.

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 five (25) 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 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 design team.
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. 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 to 120 degrees F (4 to 49 degrees C) is ideal.

1.9 WARRANTY

- A. Provide manufacturer's standard limited warranty against defects in materials and workmanship.
 1. Warranty Period for Glass Wall Systems: Ten (10) years for cases of normal use.
 2. Warranty Period for Trolley and Hinge Assemblies: Free from defect for a period of Ten (10) years.
 3. Frame Finish:
 - a. Anodized Finishes: Warranty of ten (10) years.
 - b. Stock Color AAMA 2605 Finishes: 2 to 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 to 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. Custom Warranty Period: ____ years, to be approved and accepted in writing by manufacturer based on project's scope and application.
 4. Flat Glazing: Glazing manufacturer's standard warranty against defective materials, delamination, seal failure, and defects in manufacturing for up to Ten (10) years.

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 75 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.
- C. Thermal Performance: Tested values, certifications, and simulation protocols.
 - 1. Thermal Characteristics:
 - a. U-Value: ____.
 - b. SHGC: ____.
 - c. VLT: ____.
 - d. 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.
 - 4. Visible Light Transmittance: Unit complies with Visible Light Transmittance, NFRC rating, or simulation in accordance with NFRC 200 protocol, shown in manufacturer's published data for glazing and sill specified.
 - 5. Condensation Resistance Factor: Unit to comply with the Condensation Resistance Factor, NFRC rated, or simulation in accordance with NFRC 500 protocol, shown in manufacturers published data for the glazing and sill specified.
- D. Compliance for Framed Systems:
 - 1. G2 Folding Wall Sytems:
 - a. Folding Wall System: SI3000 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 2553 mm). (NCTL-110-15005-1, NCTL-110-15135-1, & NCTL-110-15540).

- 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Outfold Standard Sill: 0.02 cfm/sqft.
 - b) Infold Standard Sill: 0.07 cfm/sqft.
 - c) Outfold/Infold Flush Sill: 0.09 cfm/sqft.
 - 2) Water Penetration Test per ASTM E331:
 - a) Outfold Standard Sill: 12 psf.
 - b) Infold Standard Sill: 9 psf.
 - c) Outfold/Infold Flush Sill: 9 psf.
 - 3) Uniform Structural Load Test per ASTM E330 (Standard hardware):
 - a) Design Pressure: Positive or negative 80 psf.
 - 4) Uniform Structural Load Test per ASTM E330; Panic hardware outfold only:
 - a) Design Pressure: Positive or negative 65 psf.
 - 5) Force Entry Resistance ASTM F588 (Standard Hardware):
 - a) Passed: Grade 10.
 - 6) Florida Product Approvals Impact & Texas Department of Insurance:
 - a) Large Missile Impact in accordance with TAS 201-94.
 - 1) FL No. 12278.2 - Outfold All Wall (HVHZ).
 - 2) FL No. 12278.3 - Outfold Reinforced (W & W/O Panic Hardware) (HVHZ) (TDI).
 - 3) FL No. 12278.4- Infold Reinforced (HVHZ) (TDI).
 - 7) Florida Product Approval Non-Impact:
 - a) FL No. 12279.3 - Infold Reinforced.
 - b) FL No. 12279.4 - Outfold All Wall.
 - c) FL No. 12279.5 - Outfold Reinforced; W & W/O Panic Hardware.
- b. Folding Wall System: SI3000 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) 220.875 x 93 inches (5610 x 2362 mm); panel size of (W x H) 36 x 90 inches (914 x 2286 mm). (NCTL-110-17071, NCTL-110-15135-1, & NCTL-110-15540).
- 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Outfold Standard Sill: 0.02 cfm/sqft.
 - b) Outfold Flush Sill: 0.09 cfm/sqft.
 - 2) Water Penetration Test per ASTM E331:
 - a) Outfold Standard Sill: 12 psf.
 - b) Infold Flush Sill: 9 psf.
 - 3) Uniform Structural Load Test per ASTM E330.
 - a) Structural Test Pressure: Positive or negative 55.14 psf.
 - 4) Florida Product Approvals Impact & Texas Department of Insurance:
 - a) FL No. 12278.5 (TDI).
 - 5) Florida Product Approval Non-Impact:
 - a) FL No. 12279.6 - Infold Reinforced.
- c. Folding Wall System: SI3000 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) 78 x 101 inches (1988 x 2553 mm) (NCTL-110-19436-1).
- 1) Manufacturer's certificate showing door system meets or exceeds AW-45 Product Designated conforming to AAMA/WDMA/CSA 101.11.S.2/A440 and/or testing indicated.
 - 2) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:

- a) Outfold Standard Sill:
 - 1) Prior to Cycling: 0.07 cfm/sqft (.4 L per sec per sq m).
 - 2) After Cycling: 0.06 cfm/sqft (.3 L per sec per sq m).
 - 3) Water Penetration Test per ASTM E331 prior to and after cycling: 9 psf (440 Pa) (outfold standard sill).
 - 4) Uniform Structural Load Test per ASTM E330:
 - a) Design Pressure: Positive or negative 45 psf (2160 Pa).
 - 5) Life Cycle Testing per AAMA 910:
 - a) Tested and passed 1250 total cycles.
 - d. Folding Wall System: SI3000 Infold 90 no post 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) per side 118.59375 x 100.5 inches (3012 x 2553 mm); panel size of (W x H) 39 x 96 inches (914 x 2553 mm). (NCTL-110-14992-1 & NCTL-110-15540).
 - 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Infold Standard Sill: 0.05 cfm/sqft.
 - b) Infold Flush Sill: 0.09 cfm/sqft.
 - 2) Water Penetration Test per ASTM E331:
 - a) Infold Standard Sill: 9 psf.
 - b) Infold Flush Sill: 9 psf.
 - 3) Uniform Structural Load Test per ASTM E330:
 - a) Design Pressure: Positive or negative 80 psf.
 - 4) Force Entry Resistance ASTM F588:
 - a) Passed: Grade 10.
 - 5) Florida Product Approvals Impact & Texas Department of Insurance:
 - a) Large Missile Impact in accordance with TAS 201-94.
 - 1) FL No. 12278.1 (HVHZ) (TDI).
 - 6) Florida Product Approval Non-Impact:
 - a) FL No. 12279.2.
 - e. Folding Wall System: SI3000 Infold Segmented Radius 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) per side 216.15625 x 100.5 inches (5490 x 2553 mm); panel size of (W x H) 36 x 96 inches (914 x 2553 mm). (NCTL-110-15540-1).
 - 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Infold Standard Sill: 0.08 cfm/sqft.
 - b) Infold Flush Sill: 0.09 cfm/sqft.
 - 2) Water Penetration Test per ASTM E331:
 - a) Infold Standard Sill: 9 psf.
 - b) Infold Flush Sill: 9 psf.
 - 3) Uniform Structural Load Test per ASTM E330 (Standard Sill):
 - a) Design Pressure: Positive or negative 70 psf.
 - 4) Uniform Structural Load Test per ASTM E330 (Flush Sill):
 - a) Design Pressure: Positive or negative 70 psf.
 - 5) Force Entry Resistance ASTM F588:
 - a) Passed: Grade 10.
 - 6) Florida Product Approvals Impact & Texas Department of Insurance:
 - a) Large Missile Impact in accordance with TAS 201-94.
 - 1) FL No. 12278.7 (HVHZ) (TDI).
 - 7) Florida Product Approval Non-Impact:
 - a) FL No. 12279.7.
 - f. Folding Glass Wall ASTM E90 Testing:
 - 1) Standard Sill (F3179.01).
 - a) Glass: 1 1/8 inch IG (1/4 inch Laminated exterior, 1/2 inch air

- space, 3/8 inch Laminated interior).
 - 1) STC: 39.
 - 2) OITC: 32.
 - 2) Flush or Recessed Ramps Sills (F3179.02):
 - a) Glass: 1 1/8 inch IG (1/4 inch Laminated exterior, 1/2 inch air space, 3/8 inch Laminated interior).
 - 1) STC: 34.
 - 2) OITC: 29.
- 2. G3 Folding Wall:
 - a. Folding Wall System: SI3000 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) 260.6875 x 118.5 inches (6621.4625 x 3010 mm); panel size of (W x H) 42 x 114 inches (1067 x 2896 mm). (NCTL-110-15327-1 & NCTL-110-15501-1).
 - 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Outfold Standard Sill (Reg Thermal Rail): 0.18 cfm/sqft.
 - b) Outfold Standard Sill (LT Thermal Rail): 0.07 cfm/sqft.
 - c) Infold Standard Sill: 0.02 cfm/sqft.
 - d) Outfold/Infold Flush Sill: 0.09 cfm/sqft.
 - 2) Water Penetration Test per ASTM E331:
 - a) Outfold Standard Sill: 12 psf.
 - b) Infold Standard Sill: 9 psf.
 - c) Outfold/Infold Flush Sill: 9 psf.
 - 3) Uniform Structural Load Test per ASTM E330:
 - a) Outfold/Infold (Reg Thermal).
 - 1) Design Pressure: Positive or negative 70 psf.
 - b) Outfold (LT Thermal):
 - 1) Design Pressure: Positive or negative 50 psf.
 - 4) Force Entry Resistance ASTM F588 in accordance with TAS 202.
 - a) Passed: Grade 10.
 - 5) Florida Product Approvals Impact & Texas Department of Insurance:
 - a) Large Missile Impact in accordance with TAS 201-94 & 203-94.
 - 1) FL No. 13407.5 - Infold (Reg Thermal) (HVHZ) (TDI).
 - 2) FL No. 13407.6 - Outfold (Reg Thermal) (HVHZ) (TDI).
 - 3) FL No. 13407.7- Outfold (LT Thermal) (HVHZ) (TDI).
 - 6) Florida Product Approval Non-Impact:
 - a) FL No. 14399.3 – Infold /Outfold (LT Thermal).
 - b) FL No. 14399.4 – Infold (Reg Thermal).
 - c) FL No. 14399.5 – Infold/Outfold (Reg Thermal).
 - b. Folding Wall System: SI3000 Reg Thermal 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) 225 x 124 inches (5722x 3162 mm); panel size of (W x H) 36 x 120 inches (914 x 3048 mm). (NCTL-110-19166-1& NCTL-110-15501-1).
 - 1) Manufacturer's certificates showing door system meets or exceeds PG-70 Product Designation conforming to AAMA/WDMA/CSA 101.I.S.2/A440 and/or testing indicated.
 - 2) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Outfold Standard Sill:
 - 1) Air Infiltration: 0.13 cfm/sqft (.7 L per sec per sq m).
 - 2) Air Exfiltration: 0.14 cfm/sqft (.7 L per sec per sq m).
 - 3) Water Penetration Test per ASTM E331 prior to and after cycling: 9 psf (440 Pa) (outfold standard sill).
 - 4) Uniform Structural Load Test per ASTM E330:

- a) Design Pressure: Positive or negative 70 psf (3360 Pa).
 - 5) Florida Product Approvals Impact & Texas Department of Insurance:
 - 1) FL No. 13407.1 - Outfold (TDI).
- c. Folding Wall System: SI3000 LT Thermal 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) 225 x 101 inches (5722 x 2556 mm); panel size of (W x H) 36 x 101 inches (914 x 2556 mm). (NCTL-110-19828-1).
 - 1) Manufacturer's certificates showing door system meets or exceeds CW-PG80 Product Designation conforming to AAMA/WDMA/CSA 101.I.S.2/A440 and/or testing indicated.
 - 2) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Outfold Standard Sill:
 - 1) Air Infiltration: 0.07 cfm/sqft.
 - 3) Canada Air Infiltration/Exfiltration: A3 Level.
 - 4) Water Penetration Test per ASTM E331: 12 psf (outfold standard sill).
 - 5) Uniform Structural Load Test per ASTM E330:
 - a) Design Pressure: Positive or negative 80 psf.
- d. Folding Wall System: SI3000 Infold Reg Thermal 90 no post 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) per side 137 x 118.5 inches (3480 x 3010 mm); panel size of (W x H) 42 x 114 inches (1067 x 2896 mm). (NCTL-110-15505-1).
 - 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Infold Standard Sill: 0.16 cfm/sqft.
 - b) Flush Sill: 0.09 cfm/sqft.
 - 2) Water Penetration Test per ASTM E331:
 - a) Infold Standard Sill: 9 psf.
 - b) Infold Flush Sill: 9 psf.
 - 3) Uniform Structural Load Test per ASTM E330 (Standard Sill):
 - a) Design Pressure: Positive 90 or negative 80 psf.
 - 4) Uniform Structural Load Test per ASTM E330 (Flush Sill):
 - a) Design Pressure: Positive Positive or negative 55 psf.
 - 5) Force Entry Resistance ASTM F588 in accordance with TAS 201 & 203:
 - a) Passed: Grade 10.
 - 6) Florida Product Approvals Impact & Texas Department of Insurance:
 - a) Large Missile Impact in accordance with TAS 201 & 203.
 - b) FL No. 13407.2 Infold Flush Sill (HVHZ) (TDI).
 - c) FL No. 13407.3 Infold Standard Sill (HVHZ) (TDI).
 - d) FL No. 13407.4 Outfold (HHVZ) (TDI).
 - 7) Florida Product Approval Non-Impact:
 - a) FL No. 14399.2 Infold Flush Sill.
 - b) FL No. 14399.2 Infold Standard Sill.
- e. Folding Glass Wall ASTM E90 Testing:
 - 1) G3 LT Thermal Rail:
 - a) Standard Sill (F3184.01).
 - 1) Glass: 1 1/8 inch IG (1/4 inch Laminated exterior, 1/2 inch air space, 3/8" Laminated interior).
 - a) STC: 39.
 - b) OICT: 32.
 - b) Flush or Recessed Ramp Sills (F3179.02):
 - 1) Glass: 1 1/8 inch IG (1/4 inch Laminated exterior, 1/2 inch air space, 3/8 inch Laminated interior).
 - a) STC: 38.

- b) OITC: 31.
 - 2) G3 Narrow LT Thermal Rail:
 - a) Standard Sill (L2446.01B).
 - 1) Glass: 1 9/16 inch IG (3/8 inch Laminated exterior, 3/4 inch air space, 3/8 inch Laminated interior).
 - a) STC: 45.
 - b) OITC: 35.
 - b) Flush Sills (L2446.01A):
 - 1) Glass: 1 9/16 inch IG (3/8 inch Laminated exterior, 3/4 inch air space, 3/8 inch Laminated interior).
 - a) STC: 44.
 - b) OITC: 35.
- 3. Stack Wall:
 - a. Stacking Wall System: SI3200 G2 Reg Thermal 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) per side 144 x 96 inches (3658 x 2438 mm); panel size of (W x H) 34.06 x 90.44 inches (865 x 2297 mm). (NCTL-110-15505-1).
 - 1) Air Infiltration Test Per ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential:
 - a) Tank Sill: 0.25 cfm/sqft.
 - 2) Uniform Structural Load Test per ASTM E330:
 - a) Design Pressure: Positive or negative 40 psf.
 - 3) Florida Product Approval Non-Impact:
 - a) FL No. 12279.7.
 - b. Stack Wall ASTM E90 Testing:
 - 1) G3 Narrow LT Thermal Rail:
 - a) Tank Sill (F3348.01).
 - 1) Glass: 1 5/16 inch IG (1/4 inch Laminated exterior, 3/4 inch air space, 1/4 inch Laminated interior).
 - a) STC: 32.
 - b) OITC: 28.
 - b) Tank Sill with Exposed head (L2446.01C).
 - 1) Glass: 1 9/16 inch IG (3/8 inch Laminated exterior, 3/4 inch air space, 3/8 inch laminated interior).
 - a) STC: 36.
 - b) OITC: 30.
 - c) Tank Sill with Covered head (L2446.01C2).
 - 1) Glass: 1 9/16 inch IG (3/8 inch Laminated exterior, 3/4 inch air space, 3/8 inch laminated interior).
 - a) STC: 36.
 - b) OITC: 31.
 - d) Dust Proof Strikes with Exposed head (L2446.01D).
 - 1) Glass: 1 9/16 inch IG (3/8 inch Laminated exterior, 3/4 inch air space, 3/8 inch laminated interior).
 - a) STC: 41.
 - b) OITC: 32.
 - e) Dust Proof Stikes with Covered head (L2446.01D1).
 - 1) Glass: 1 9/16 inch IG (3/8 inch Laminated exterior, 3/4 inch air space, 3/8 inch laminated interior).
 - a) STC: 40.
 - b) OITC: 32.

2.3 GLASS WALL SYSTEMS

A. Glass Wall Systems:

1. Basis of Design: SI3000 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.
2. Basis of Design: SI3000 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.
3. Basis of Design: SI3000 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.
4. Basis of Design: SI3000 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.
5. Basis of Design: SI3000 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.
6. Basis of Design: SI3000 G3 light folding glass wall system as manufactured by Solar Innovations Architectural Glazing Systems, light thermal extruded aluminum frame with a thermal isolation separation, 2.75 inches (69.85 mm) width.
7. Basis of Design: SI3200 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.
8. Basis of Design: SI3200 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.
9. Basis of Design: SI3200 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.
10. Basis of Design SI3000 G3Stacking wall system as manufactured by Solar Innovations Architectural Glazing System, narrow thermal extruded aluminum frame with a thermal isolation separation 1.81 inches (45.97 mm) width.
11. Basis of Design: SI3200 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.
12. Basis of Design SI3200 G3 light folding glass wall system as manufactured by Solar Innovations Architectural Glazing systems, light thermal extruded aluminum frame with a thermal isolation separation 2.75 inches (69.85 mm) width.
13. 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.
14. Basis of Design: SI3000C clear wall system as manufactured by Solar Innovations Architectural Glazing Systems; folding glass wall with non-thermal extruded aluminum frame 1.5 inches (38.10 mm) width.
15. Framing Members Thickness: As indicated on Drawings.
16. Framing Members Thickness: Minimum .125 inch (3.2 mm) wall thickness for structural members.
17. Framing Members Thickness: Thickness as determined by manufacturer based on design loading, cross sectional configuration, and fabrication requirements.
18. Load Bearing: As indicated on Drawings.
19. Load Bearing: Top load bearing system.
20. Load Bearing: Bottom load bearing system.
21. Operation: Out-folding system.
22. Operation: In-folding system.
23. Operation: Slide and stack.
24. Operation: As indicated on Drawings.
25. Configuration: As indicated on Drawings.
26. Configuration: Custom, _____.

27. Configuration: For folding wall systems, all wall.
28. Configuration: For folding wall systems, center pivot.
29. Configuration: For folding wall systems, double door.
30. Configuration: For folding wall systems, split wall.
31. Configuration: For folding wall systems, single door.
32. Configuration: For folding wall systems, 135 degrees no post.
33. Configuration: For folding wall systems, 90 degrees no post.
34. Configuration: For folding wall systems, segmented radius.
35. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, straight wall 60 degrees parallel stack.
36. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, straight wall 60 degrees parallel stack with integrated door panel.
37. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, straight wall 60 degrees parallel stack with fixed door panel.
38. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, split wall 60 degrees parallel stack.
39. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, segmented radius 60 degrees perpendicular stack.
40. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, segmented radius 60 degrees parallel stack.
41. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, no post corner 60 degrees perpendicular stack.
42. Configuration: For slide and stack wall systems, 60 degrees offset stack individual panel, no post corner 60 degrees parallel stack.
43. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall parallel stack.
44. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall perpendicular stack.
45. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall parallel stack with fixed door panel.
46. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall perpendicular stack with fixed door panel.
47. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall parallel stack with integrated door panel.
48. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall perpendicular stack with integrated door panel.
49. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall remote stack perpendicular stack with integrated door panel.
50. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, segmented radius wall parallel stack.
51. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, segmented radius wall perpendicular stack.
52. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, straight wall parallel remote stack.
53. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, offset wall parallel remote multiple stack.
54. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, corner wall perpendicular remote stack.
55. Configuration: For slide and stack wall systems, 90 degrees offset stack individual panels, corner wall perpendicular stack.
56. Configuration: For slide and stack wall systems, 90 degrees center hung hinged pairs, straight wall perpendicular stack.
57. Configuration: For slide and stack wall systems, 90 degrees center hung hinged pairs, offset wall perpendicular stack.
58. Configuration: For slide and stack wall systems, 90 degrees center hung hinged pairs, segmented radius wall perpendicular stack.

59. Panel Size: As indicated on Drawings.
60. Panel Size:
 - a. Width _____.
 - b. Height _____.
61. Mullions: Narrow mullion, 2-5/8 inches (67 mm) for G2 wall systems.
62. Mullions: Standard mullion, 3-1/2 inches (89 mm) for G2 wall systems.
63. Mullions: G3 Terrace Door mullion, 3-5/16 inches (84 mm) for G3 wall systems.
64. Mullions: G3 Terrace Door mullion, 3-5/16 inches (84 mm) for G3 wall systems.
65. Mullions: G3 Mullion 275, 4-1/4 inches (108 mm) for G3 wall systems.
66. Mullions: As indicated on Drawings.
67. 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) wide traditional grid.
 - h. Type: Applied grids, 7/8 inch (22 mm) ogee grid.
 - i. Type: Interior muntin grid on insulated glazing.
 - j. Type: Interior and exterior applied grids with simulated divided lites (SDL), low profile grid.
 - k. Type: Interior and exterior applied grids with simulated divided lites (SDL), Ogee grid.
 - l. Type: Interior and exterior applied grids with simulated divided lites (SDL), traditional grid.
 - m. Type: Interior and exterior applied grids with simulated divided lites (SDL), 1-1/4 inch (32 mm) wide traditional grid.
 - n. Type: Interior and exterior applied grids, arched grid.
 - o. Type: Interior and exterior applied grids, gothic grid.
 - p. Type: Interior and exterior applied grids, double gothic grid.
 - q. Type: Interior and exterior applied grids, English grid.
 - r. Type: Interior and exterior applied grids, traditional grid.
 - s. Type: Interior and exterior applied grids, cross grid.
 - t. Type: Decorative raised panels.
68. 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. Type: SI1000 G-Series Retractable Screens as manufactured by Solar Innovations Architectural Glazing Systems.
 - h. Type: SI1000 W-H & W-V Series Horizontally Retractable Screen System as manufactured by Solar Innovations Architectural Glazing Systems.
 - i. Framing: Aluminum, 1 x 1 inch (25 x 25 mm).
 - j. Screen Materials: As indicated on the Drawings.
 - k. Size: As indicated on the Drawings.
 - l. Size: _____.

- m. Mounting and Configuration: As indicated on Drawings.
- 69. Perimeter Weather Gaskets (Framed Systems): EPDM with solid strand cord.
- 70. Perimeter Weather Gaskets (Clear Walls): Translucent PVC.
- 71. Sill: Standard sill. (FGW only)
- 72. Sill: Standard recessed sill. (FGW only)
- 73. Sill: Flush sill. (FGW only)
- 74. Sill: Recessed Flush sill. (FGW only)
- 75. Sill: Recessed ramp sill (ADA). (FGW only)
- 76. Sill: Top load only, Thermal ADA. (Framed FGW Only)
- 77. Sill: Top load only, Recessed Thermal ADA. (FGW only)
- 78. Sill: Top load only, ADA surface mount sill.
- 79. Sill: Top load only, surface mount sill.
- 80. Sill: Top load only, recessed flush hat sill.
- 81. Sill: Top load only, ADA recessed flush hat sill.
- 82. Sill: Dust proof floor strikes, aluminum. (Stack Wall only)
- 83. Sill: Tank sill, with drain tube available. (Stack Wall only)
- 84. Sill: Tank sill with ADA ramps, with drain tube available. (Stack Wall only)
- 85. Sill: Sill fillers, in locations as approved by manufacturer.
- 86. Sill: As indicated on Drawings.
- 87. Drain Tubes: Factory fabricated. top load only. Field fabricated drain tubes are not acceptable.

B. Hardware:

- 1. For Framed 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: Satin Nickel.
 - 4) Finish: Polished Brass.
 - 5) Finish: Brushed Chrome.
 - 6) Finish: Rustic Umber.
 - 7) Finish: Oil Rubbed Brass
 - c. Handles: Standard Allegro style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Black.
 - 3) Finish: White.
 - 4) Finish: Satin Chrome.
 - 5) Finish: Polished Chrome.
 - 6) Finish: Polished Brass.
 - 7) Finish Antique Brass.
 - 8) Finish: Dark Bronze.
 - 9) Finish: Satin Nickel.
 - 10) Finish: Pewter.
 - 11) Finish: Oil Rubbed Bronze.
 - d. Handles: Aluminum, Frankfurt style, for inland applications.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Painted Silver.
 - 3) Finish: Pure White.
 - 4) Finish: Chestnut.
 - e. Handles: Aluminum, London style, for inland applications.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Painted Silver.
 - f. Handles: Zamac/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: Oil Rubbed Bronze.
- 7) Finish: Dark Bronze.
- 8) Finish: Pewter.
- 9) Finish: Black.
- 10) Finish: White.
- 11) Finish: Stain Nickel.
- g. Handles: Solid brass, Rodos style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Oil Rubbed Brass.
 - 3) Finish: Brushed Chrome.
 - 4) Finish: Rustic Umber.
 - 5) Finish: White.
 - 6) Finish: Matte Black.
 - 7) Finish: Satin Nickel.
 - 8) Finish: Antique Brass.
- h. 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: Antique Brass.
 - 10) Finish: Polished Brass.
- i. 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: Matte Black.
 - 7) Finish: Satin Nickel.
 - 8) Finish: Antique Brass.
 - 9) Finish: Polished Brass.
 - 10) Finish: Dark Bronze Metallic.
- j. Handles: Solid brass, Dallas style.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Rustic Umber.
 - 3) Finish: Matte Black.
 - 4) Finish: Satin Nickel.
 - 5) Finish: Polished Brass.
 - 6) Finish: Dark Bronze Metallic.
- k. Handles: AR2190.
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Bright Brass.
 - 3) Finish: Satin Brass.
 - 4) Finish: Dark Bronze.
 - 5) Finish: Bright Stainless.
 - 6) Finish: Satin Stainless.
- l. Pulls: Type and finish as scheduled and indicated on Drawings.
- m. 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.
- n. 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.
- o. Pulls: Extruded hinge 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.
- p. Hinges: As scheduled and indicated on Drawings.
- q. 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.
- r. 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.
- s. Hinges: Semi-concealed aluminum hinge with stainless steel bushings and security bolt end; 3-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 unkeyed 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 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.
- 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. Adjustable Door Catches:
 - 1) Finish: As scheduled and indicated on Drawings.
 - 2) Finish: Class 1 clear anodized.
 - 3) Finish: Dark bronze anodized.
- dd. Door Limiters: In locations as scheduled and indicated on Drawings.
- ee. Commercial Panic Hardware: As scheduled and indicated on Drawings.
- ff. Commercial Panic Hardware: None.
- gg. Commercial Panic Hardware: Exterior entry trim, square style.
- hh. Commercial Panic Hardware: Mortise panic.
- ii. Commercial Panic Hardware: Impact panic.
- jj. Commercial Panic Hardware: Push/pull.
- kk. Commercial Panic Hardware: Push only.
- ll. Passive Hardware: As scheduled and indicated on Drawings.
- mm. Passive Hardware: None.
- nn. Passive Hardware: Square style for commercial applications.
- oo. Passive Hardware: Toronto style.
- 2. Stainless Steel Bearings: With eight rollers which can be serviced without being removed from their track system.
- 3. Stainless Steel Bearings: With rollers which can be serviced without being removed

from their track system.

4. Fasteners: For applications in locations as approved by manufacturer.
5. Locking Rods: Concealed stainless steel locking rods; aluminum locking rods not acceptable.
6. Corners:
 - a. Corner Lugs: Extruded aluminum, with thermal break.
 - b. Corner Connectors: With thermal break.
7. End Caps: Do not breach thermal break.
8. Hardware for Clear Folding and Slide and Stack:
 - 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. Handles: As scheduled and indicated on Drawings.
 - f. Handle notch in glazing
 - g. Handle: 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.
 - h. Hinges: Clear FGW.
 - 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.
 - i. Bottom Locks: As scheduled and indicated on Drawings.
 - j. Bottom Locks: Thumbturn non keyed locks.
 - k. Bottom Lock: Thumbturn keyed locks.

C. Materials:

1. Aluminum Flashing and Closures:
 - a. Alloy and Temper: 6063-T5, 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: Framed Systems:
 - a. Glazing: Single pane, 3/16 inch (5 mm) float glass.
 - b. Glazing: Single pane, 1/4 inch (7 mm) float glass.
 - c. Glazing: Single pane, 1/2 inch (12 mm) float glass.
 - d. Glazing: Single pane, polycarbonate.
 - e. Glazing: Custom, Single pane, _____.
 - f. Glazing: Custom, Double pane, _____.
 - g. Glazing: Custom, Triple pane, _____.
 - h. Glazing: Double pane glazing, 1 inch (25 mm) insulated glass unit.
 - 1) Exterior and Interior Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 272 low-emissivity coating on surface two.
 - a) Visible Light Transmittance: 72 percent.
 - b) Solar Heat Gain Coefficient: 0.41.
 - c) U-Factor:0.26.
 - 2) Exterior and Interior Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 366 low-emissivity coating on surface two.
 - a) Visible Light Transmittance: 65 percent.
 - b) Solar Heat Gain Coefficient: 0.27.
 - c) U-Factor:0.25.
 - 3) Exterior and Interior Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 340 low-emissivity coating on surface two.
 - a) Visible Light Transmittance: 39 percent.
 - b) Solar Heat Gain Coefficient: 0.18.
 - c) U-Factor:0.26.
 - 4) Exterior and Interior Glazing Lites: 1/4 inch (7 mm) tempered clear glass with LoE 272 low-emissivity coating on surface two.
 - a) Visible Light Transmittance: 70 percent.
 - b) Solar Heat Gain Coefficient: 0.40.
 - c) U-Factor:0.25.
 - 5) Outboard Glazing Lites: As indicated on drawings.
 - 6) Air Spacers: Stainless steel spacer with dual seals of polyisobutylene/silicone and filled with argon gas.
 - i. Glazing: Specialty, thermochromic glass.
 - j. Glazing: Specialty, Solera light diffusion glazing system.
 - k. Glazing: Specialty, Lumira polycarbonate filled polycarbonate panels.
 - l. Glazing: Decorative, _____.
 - m. Glazing Decorative, Pattern 62.
 - n. Glazing Decorative, single glue chip.
 - o. Glazing Decorative, glue chip.
 - p. Glazing Decorative, English reeded.
 - q. Glazing Decorative, satin/acid etch.
10. 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.
11. Glazing: Clear Walls.
 - a. Glazing: Single pane, 1/2 inch (12 mm) float glass.
 - b. Glazing: Single pane, 5/8 inch (15 mm) float glass.
 - c. Glazing: Single pane, _____.

- d. Glazing: Single pane. As indicated on Drawings.
 - e. Gaskets: As indicated on Drawings.
 - f. Gaskets: H Clear wall seal, Translucent PVC, for folding glass wall or slide and stack systems.
 - g. Gaskets: 9/16 inch (14.3) clear wall gaskets, translucent silicone, for slide and stack systems
12. Setting Blocks, Edge Blocks, and Spacers: As recommended by manufacturer and compatible with insulated glass.
 13. Fasteners: Aluminum and stainless steel, not causing electrolytic action or corrosion.
 14. Fasteners: Zinc Cadmium-plated, acceptable in locations as approved by manufacturer.
 15. 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 clear anodized finish, Class I AAMA 611.
6. Aluminum Wall Frames: Manufacturer's standard dark bronze anodized, Class 1 AAMA 611.
7. Aluminum Wall Frames: Copper cladding.
8. Aluminum Wall Frames: 304 stainless steel cladding with No. 4 satin finish.
9. Aluminum Wall Frames: Bass cladding.
10. Aluminum Wall Frames: Bronze cladding.
11. Aluminum Wall Frames: Rheinzink Bright Rolled cladding.
12. Aluminum Wall Frames: Rheinzink Blue Gray cladding.
13. Aluminum Wall Frames: Rheinzink Graphite Gray cladding.
14. Aluminum Door Frames: Powder coating solids finish, white, AAMA 2605.
15. Aluminum Door Frames: Powder coating solids finish, black, AAMA 2605.
16. Aluminum Door Frames: Powder coating solids finish, sandstone, AAMA 2605.
17. Aluminum Door Frames: Powder coating solids finish, natural clay, AAMA 2605.
18. Aluminum Door Frames: Powder coating solids finish, bronze, AAMA 2605.
19. Aluminum Wall Frames: Powder coating solids finish, bone white, AAMA 2605.
20. Aluminum Wall Frames: Powder coating solids finish, fashion gray, AAMA 2605.
21. Aluminum Wall Frames: Powder coating solids finish, colonial gray, AAMA 2605.
22. Aluminum Wall Frames: Powder coating solids finish, military light blue, AAMA 2605.
23. Aluminum Wall Frames: Powder coating solids finish, burgundy, AAMA 2605.
24. Aluminum Wall Frames: Powder coating solids finish, charcoal, AAMA 2605.
25. Aluminum Wall Frames: Powder coating solids finish, apollo white, AAMA 2605
26. Aluminum Wall Frames: Powder coating solids finish, ivory, AAMA 2605.
27. Aluminum Wall Frames: Powder coating solids finish, seawolf, AAMA 2605.
28. Aluminum Wall Frames: Powder coating solids finish, Antique Bronze, AAMA 2605.
29. Aluminum Wall Frames: Acacia 1001, Light DS 716 textured faux wood finish.
30. Aluminum Wall Frames: Acacia 1001, Light DS 402 smooth faux wood finish.
31. Aluminum Wall Frames: Acacia 1001, Dark DS 733 textured faux wood finish.
32. Aluminum Wall Frames: Acacia 1001, Dark DS 403 smooth faux wood finish.
33. Aluminum Wall Frames: Douglas fir 1501 DS 716 textured faux wood finish.
34. Aluminum Wall Frames: Douglas fir 1501 DS 402 smooth faux wood finish.
35. Aluminum Wall Frames: Cherry 1402 DS 716 textured faux wood finish.
36. Aluminum Wall Frames: Cherry 1402 DS 402 smooth faux wood finish.
37. Aluminum Wall Frames: Knotty pine 2103 DS 716 textured faux wood finish.
38. Aluminum Wall Frames: Knotty pine 2103 DS 402 smooth faux wood finish.
39. Aluminum Wall Frames: Cherry 1402 DS 733 textured faux wood finish.
40. Aluminum Wall Frames: Cherry 1402 DS 403 smooth faux wood finish.

41. Aluminum Wall Frames: Oak assi 2501 DS 733 textured faux wood finish.
42. Aluminum Wall Frames: Oak assi 2501 DS 403 smooth faux wood finish.
43. Aluminum Wall Frames: Dark walnut 1802 DS 733 textured faux wood finish.
44. Aluminum Wall Frames: Dark walnut 1802 DS 403 smooth faux wood finish.
45. Aluminum Wall Frames: Teak 2601 DS 706 textured mahogany faux wood finish.
46. Aluminum Wall Frames: National walnut 1806 DS 706 textured mahogany faux wood finish.
47. Aluminum Wall Frames: White oak wood veneering.
48. Aluminum Wall Frames: Cherry wood veneering.
49. Aluminum Wall Frames: Walnut wood veneering.
50. Aluminum Wall Frames: Douglas fir wood veneering.
51. Aluminum Wall Frames: Mahogany wood veneering.
52. Aluminum Wall Frames: Pecan Pine wood veneering.
53. Aluminum Screen Frames: Finish as indicated on Drawings.
 - a. Folding and Stacking:
 - 1) Manufacturer's standard clear anodized, Class 1 AAMA 611.
 - 2) Manufacturer's standard dark bronze anodized, AAMA 611.
 - 3) Manufacturer's designer black finish, 2605.
 - 4) Manufacturer's designer white finish, 2605.
 - 5) Manufacturer's designer sandstone finish, 2605.
 - 6) Manufacturer's designer natural clay finish, 2605.
 - 7) Manufacturer's designer bronze finish, 2605.
 - 8) Manufacturer's designer Hartford green finish, 2605.
 - 9) Powder coating solids black finish, AAMA 2605.
 - 10) Powder coating solids apollo white finish, AAMA 2605.
 - 11) Powder coating solids bone white finish, AAMA 2605.
 - 12) Powder coating solids ivory finish, AAMA 2605.
 - 13) Powder coating solids sandstone finish, AAMA 2605.
 - 14) Powder coating solids seawolf finish, AAMA 2605.
 - 15) Powder coating solids fashion gray finish, AAMA 2605.
 - 16) Powder coating solids colonial gray finish, AAMA 2605.
 - 17) Powder coating solids charcoal finish, AAMA 2605.
 - 18) Powder coating solids military light blue finish, AAMA 2605.
 - 19) Powder coating solids burgundy finish, AAMA 2605.
 - 20) Powder coating solids Hartford green finish, AAMA 2605.
 - 21) Powder coating solids antique bronze finish, AAMA 2605.
 - 22) Decoral finishes, powder coat, Knotty Pine 1501, DS 716 Textured.
 - 23) Decoral finishes, powder coat, Knotty Pine 1501, DS 402 Smooth.
 - 24) Decoral finishes, powder coat, Douglas Fir 1501, DS 716 Textured.
 - 25) Decoral finishes, powder coat, Douglas Fir 1501, DS 402 Smooth.
 - 26) Decoral finishes, powder coat, Acacia 1001, DS 716 Textured.
 - 27) Decoral finishes, powder coat, Acacia 1001, DS 402 Smooth.
 - 28) Decoral finishes, powder coat, Cherry 1402, DS 716 Textured.
 - 29) Decoral finishes, powder coat, Cherry 1402, DS 402 Smooth.
 - 30) Decoral finishes, powder coat, Acacia 1001, DS 733 Textured.
 - 31) Decoral finishes, powder coat, Acacia 1001, DS 403 Smooth.
 - 32) Decoral finishes, powder coat, Oak Assi 2501, DS 733 Textured.
 - 33) Decoral finishes, powder coat, Oak Assi 2501, DS 403 Smooth.
 - 34) Decoral finishes, powder coat, Cherry 1402, DS 733 Textured.
 - 35) Decoral finishes, powder coat, Cherry 1402, DS 403 Smooth.
 - 36) Decoral finishes, powder coat, Dark Walnut 1802, DS 733 Textured.
 - 37) Decoral finishes, powder coat, Dark Walnut 1802, DS 403 Smooth.
 - 38) Decoral finishes, powder coat, Teak 2601, DS 706 Textured Mahogany finish.
 - 39) Decoral finishes, powder coat, National Walnut 1806, DS 706 Textured Mahogany finish.

- 40) Standard wood veneering, Douglas Fir, unfinished.
 - 41) Standard wood veneering, White Oak, unfinished.
 - 42) Standard wood veneering, Walnut, unfinished.
 - 43) Standard wood veneering, Honduran Mahogany, unfinished.
 - 44) Designer wood veneering, Ponderosa White Pine, unfinished.
 - 45) Designer wood veneering, Pecan Pine, unfinished.
 - 46) Designer wood veneering, Cherry, unfinished.
- b. B-Series Retractable:
 - 1) Black.
 - 2) Grey.
 - 3) White.
 - c. C-Series Eco Screen:
 - 1) White.
 - 2) Bronze.
 - 3) Clear Anodized.
 - d. G-Series Retractable - Sheer:
 - 1) White.
 - 2) Black.
 - 3) Adobe.
 - 4) Brown.
 - 5) Tan.
 - e. G-Series Retractable - Milano:
 - 1) White.
 - 2) Brownstone.
 - 3) Desert Tan.
 - 4) Adobe.
 - f. S-Series Retractable:
 - 1) Mocha.
 - 2) Brown.
 - 3) Ivory.
 - 4) Bronze.
 - 5) White.
 - 6) Black.
 - 7) Grey.
 - 8) Taupe.
 - 9) Green.
 - g. W-V & W-H Series Retractable:
 - 1) White.
 - 2) Black.
 - 3) Bronze.
 - 4) Clear Anodized.Sandalwood (W-H Series Only).
54. Aluminum Screen Frames: Finish as indicated on Drawings.
55. Aluminum Screen Frames: _____.
56. Aluminum Screen Frames: Finish to match frames.

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