

SECTION 08495
FOLDING GLASS WALL SYSTEM
BY SOLAR INNOVATIONS™

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Folding Glass Wall System.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Openings in cast-in-place concrete.
- B. Section 03450 - Precast Concrete Wall Panels: Openings in precast concrete wall panels.
- C. Section 04810 - Unit Masonry Assemblies: Openings in masonry.
- D. Section 05400 - Cold Formed Metal Framing: Framed Openings.
- E. Section 06100 - Rough Carpentry: Framed openings.
- F. Section 06200 - Finish Carpentry: Interior wood casing.
- G. Section 07210 - Building Insulation: Batt insulation at window perimeter.
- H. Section 07460 - Siding and trim.
- I. Section 07620 - Flashing and Sheet Metal: Flashing associated with windows and doors.
- J. Section 07900 - Joint Sealers: Perimeter joint sealant and backer rod.

1.3 REFERENCES

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
- B. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- C. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
- D. ASTM B 221 / B221M – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- E. ASTM B 241 / B 241M – Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Tube.
- F. ASTM C 1115 – Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories.
- G. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- H. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

- I. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
- J. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
- K. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls, and Doors.
- L. AWS D1 - Structural Welding Code.
- M. FGMA - Flat Glass Marketing Association, Glazing Manual

1.4 PERFORMANCE REQUIREMENTS

- A. System Design: Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of folding glass wall as calculated in accordance with applicable code.
- B. Wall system when tested on a typical four panel folding wall unit, 126.75 inches (3219 mm) in width and 84.5 inches (2146 mm) in height shall meet or exceed the following performance tests.
 - 1. Air Infiltration Test: ASTM E 283:
 - a. Force of 1.57 psf (25 mph) = 0.03 cfm/ft² infiltration.
 - b. Force of 6.24 psf (50 mph) = 0.06 cfm/ft² infiltration.
 - 2. Water Penetration Test: ASTM E 331 and ASTM E 547:
 - a. Water pressure of 9.75 psf and 5.0 gph/ft² = no leakage.
 - 3. Uniform Structural Load Test: ASTM E 330:
 - a. Force of 120.0 psf exterior = 0.008 inch permanent set (overload).
 - b. Force of 120.0 psf interior = 0.004 inch permanent set (overload).
 - c. Approximately 215 mph wind load.
 - 4. Thermal Penetration Test: AAMA 1503-9:
 - a. Thermal Transmittance (U Value) = 0.47 btu/hr/ ft² / Degrees F.
 - b. Condensation Resistance Factor (CRF) = 54.
 - 5. Florida Product Approval
 - a. Non-Impact FL# 12279.3
- C. Wall system when tested on a typical six panel folding wall unit, 223.75 inches (5683mm) in width and 96 inches (2553mm) in height shall meet or exceed the following performance tests.
 - 1. High Velocity Hurricane Zone : Air Infiltration test, ASTM E 331 in accordance with TAS 202-94:
 - a. Force of 1.57 psf (25 mph) = 0.03cfm/ft² infiltration.
 - b. Force of 6.24 psf (50 mph) = 0.06 cfm'ft² infiltration.
 - 2. High Velocity Hurricane Zone : Water Infiltration test, ASTM E 331 in accordance with TAS 202-94:
 - a. Water pressure of 9.75 psf and 5.0gph/ft² = no leakage.
 - 3. High Velocity Hurricane Zone: Static Test, ASTM E 330 in accordance with TAS 202-94:
 - a. Force of 120.0 psf exterior = 0.008 inch permanent set (overload).
 - b. Force of 120.0 psf internal = 0.004 inch permanent set (overload).
 - 4. Large Missile Impact: ASTM E 1886 and ASTM E 1996 for large missile impact in accordance with TAS 201-94:
 - a. Speed of 50ft/sec = No Penetration.
 - 5. Cycle Pressure Loading: ASTM E 1886 and ASTM E. 1996 for cycling pressure in accordance with TAS 203-94:
 - a. Design Pressure of plus 60 psf – 1.5 Seconds/Passed 40/Min.
 - b. Design Pressure of minus 60 psf – 1.5 Seconds/Passed 40/Min.
 - 6. Florida Product Approval:
 - a. Impact Approved (Infold) FL# 12279.1
 - b. Impact Approved (Outfold) FL# 12279.2

7. Miami Dade Certification:
 - a. Notice of Acceptance (NOA) (Outfold) # 07-0326.07.
 - b. Notice of Acceptance (NOA) (Infold) # 07-1012.06.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings: Detailed drawings prepared specifically for the project by manufacturer. Show opening dimensions, framed opening tolerances, profiles, product components, anchorages, accessories.
 1. Indicate material thickness, fastener locations, glazing and hardware arrangements.
 2. Include schedule identifying each unit, with marks or numbers referencing drawings.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples:
 1. Aluminum Finish: Two samples, minimum size 2 by 3 inches (50 by 75 mm), representing actual product and color.
 2. Glass: Two samples, minimum size 12 inches (300 mm) square, of specified glass, including coatings or frit pattern.
 3. Assembly Sample: 24 by 36 inch (600 by 900 mm) assembly complete with glazing, gaskets, fasteners, anchors, and finish; do not proceed with fabrication until workmanship and color are approved by Architect.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section with minimum 5 years experience in fabrication and erection of glazed window wall systems for projects of similar scope.
- B. Installer Qualifications: Experienced in performing work of this section that has specialized in installation of work similar to that required for this project.
- C. Mock-Up: Provide a full size mock-up for evaluation of surface preparation techniques and application workmanship.
 1. Finish areas designated by Architect.
 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 3. Refinish mock-up area as required to produce acceptable work.
 4. Incorporate accepted mock-up as part of the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect factory finishes from damage, precipitation and construction materials until ready for installation.

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 absolute limits.

1.9 WARRANTY

- A. Provide glazed structure manufacturer's warranty that properly installed structure will be free from significant defects in material, workmanship, and uncontrolled water leakage for five years from date of Substantial Completion.
- B. Warranty anodized aluminum finish for five years.
- C. For stock color PPG Duranar 70 percent fluoropolymer finishes, provide paint manufacturer's warranty for color and film integrity for at least 10 years from date of application.
- D. For custom color PPG Duranar 70 percent fluoropolymer finishes, provide paint manufacturer's warranty for color and film integrity for at least ten years from date of application.
- E. For stock color PPG Acrynar 50 percent fluoropolymer finishes, provide warranty for color and film integrity for ten years from date of application.
- F. For custom color PPG Acrynar 50 percent fluoropolymer finishes, provide paint manufacturer's warranty for color and film integrity for at least ten years from date of application.
- G. For stock color PPG Duracron, thermosetting acrylic resin finishes, provide warranty for cracking and pulling integrity for five years from date of application.
- H. For custom color PPG Duracron, thermosetting acrylic resin finishes, provide paint manufacturer's warranty for cracking and pulling integrity for at least five years from date of application.
- I. For glazing, provide glazing manufacturer's standard warranty against defective materials, delamination, seal failure, and defects in manufacturing for at least five years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solar Innovations; 31 Roberts Road, Pine Grove, PA 17963. ASD. Tel. Toll Free: (800) 618-0669. Tel: (570)915-1500. Fax: (570) 915-6083. Email: skylight@solarinnovations.com. www.solarinnovations.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 FOLDING GLASS WALL

- A. Provide folding glass walls factory assembled and glazed, complete with weatherstripping, glazing, operating hardware and specified accessories. Wall system shall be provided to fit the openings indicated on the Drawings and as follows:
 - 1. Panel Size:
 - a. _____.
 - b. As indicated on the Drawings.
 - 2. Operation:
 - a. Out-folding system.
 - b. In-folding system.
 - c. Top load suspension system.
 - d. Bottom load system.
 - 3. Panels:
 - a. Glazing: 1 inch (25 mm) sealed insulating glass.

- b. Glazing: 1/4 inch (6.35 mm) tempered glass.
- c. Glazing: 7/16 inch (11.11 mm) high strength laminated glass.
- d. Decorative mullions.
- e. Interior Grids, 3/16 inch (4.76 mm) by 5/8 inch (15.87 mm).
- f. Simulated Divided Lites, 3/8 inch (9.52 mm) by 5/8 inch (15.87 mm).
- g. Decorative Raised Panels.
- 4. Framing:
 - a. Extruded aluminum.
 - b. Extruded aluminum frame with thermo break separation.
- 5. Accessories:
 - a. Moldings.
 - b. Sill Cover.
 - c. Perimeter Weather Gaskets: EPDM with solid strand cord.
- 6. Hardware:
 - a. Triple knuckle aluminum and stainless corrosion proof hinges.
 - b. Stainless steel bearings.
 - c. Flushbolts on folding doors.
 - d. 3 point locks on swing doors.

2.3 MATERIALS

- A. Aluminum: 6063-T6, 6063-T5, or 6105-T5 alloy and temper. Other alloys and tempers may be used for non-structural members provided they do not void the required warranties. Indicate alloys and tempers clearly on shop drawings and in structural calculations.
 - 1. Framing Members: Thickness based on the design loading, cross sectional configuration, and fabrication requirement.
 - 2. Aluminum Flashing and Closures: Minimum of 0.040 inches (1.0 mm) thick.
 - 3. Snap-On Covers and Miscellaneous Non-Structural Trim: Minimum thickness recommended by the manufacturer.
- B. Glazing: Provide glazing type as recommended by the manufacturer for the project.
- C. Flashings: Sheet aluminum, same finish as for system components; secured with concealed fastening method or fastener with head finished to match; thickness as required for conditions encountered.
- D. Thermal Break: Manufacturer's standard system to provide thermal separation between exterior and interior components.
- E. Internal Reinforcing:
 - 1. ASTM A 36/A 36M for carbon steel; or ASTM B 221/B 221M and ASTM B 241/B 241M for structural aluminum.
 - 2. Shapes and sizes to suit installation.
 - 3. Shop coat steel components after fabrication with manufacturer recommended primer.
- F. Glazing Gaskets: Compression type design, replaceable; EPDM, complying with ASTM C 864, with solid strand cord to prevent shrinkage or; Elastomeric silicone with solid strand cord to prevent shrinkage, complying with ASTM C 1115, as recommended by the manufacturer.
 - 1. Completely compatible with glazing sealant to be used.
 - 2. Profile and hardness as necessary to maintain uniform pressure for watertight seal.
 - 3. Manufacturer's standard black color.
 - 4. Factory molded corners required at interior.
- G. Setting Blocks, Edge Blocks, and Spacers: As required by manufacturer and compatible with insulated glass where required.
- H. Structural Glazing Sealant: GE Silpruf; black.
- I. Perimeter Sealant: GE Silpruf; color to match framing finish if available; otherwise color as selected from manufacturer's standard range.

- J. Anchors and Fasteners:
 - 1. Aluminum and stainless steel of type which will not cause electrolytic action or corrosion.
 - 2. Zinc cadmium-plated fasteners may be used if acceptable to manufacturer.
 - 3. Finish exposed fasteners to match aluminum frame.
- K. Accessories: Provide accessories as scheduled to achieve design intent and environmental control.
- L. Aluminum Finish: Anodized complying with AAMA 611.
 - 1. Color: Clear.
 - 2. Color: Dark bronze.
- M. Aluminum Finish: PPG Duranar, two coat, 70 percent fluoropolymer finish.
 - 1. Color: Manufacturer's standard bronze color.
 - 2. Color: Manufacturer's standard Hartford green color.
 - 3. Color: Manufacturer's standard white color.
 - 4. Color: Manufacturer's standard sandstone color.
 - 5. Color: Manufacturer's standard black color.
 - 6. Color: Manufacturer's standard natural clay color.
- N. Aluminum Finish: PPG Acrynar, two coat. 50 percent fluoropolymer finish.
 - 1. Color: Manufacturer's standard bronze color.
 - 2. Color: Manufacturer's standard Hartford green color.
 - 3. Color: Manufacturer's standard white color.
 - 4. Color: Manufacturer's standard sandstone color.
 - 5. Color: Manufacturer's standard black color.
 - 6. Color: Manufacturer's standard natural clay color.
- O. Aluminum Finish: PPG Duracron, thermosetting acrylic resin finish.
 - 1. Color: Manufacturer's standard bronze color.
 - 2. Color: Manufacturer's standard Hartford green color.
 - 3. Color: Manufacturer's standard white color.
 - 4. Color: Manufacturer's standard sandstone color.
 - 5. Color: Manufacturer's standard black color.
 - 6. Color: Manufacturer's standard natural clay color.
- P. Aluminum Finish: _____.

2.4 FABRICATION

- A. Fabricate components in accordance with approved shop drawings. Remove burrs and rough edges. Shop fabricate to greatest extent practicable to minimize field cutting, splicing, and assembly. Disassemble only to extent necessary for shipping and handling limitations. Install gaskets and tapes in factory.
- B. Welding:
 - 1. Comply with recommendations of American Welding Society.
 - 2. Grind exposed welds smooth and flush with adjacent surfaces before finishing; restore mechanical finish.
- C. Steel Components:
 - 1. Clean surfaces after fabrication and immediately prior to application of primer in accord with manufacturer's recommendations.
 - 2. Apply specified shop coat primer in accord with manufacturer's instructions to provide 2.0 mil (0.05 mm) minimum dry film thickness.
- D. Fabricate components true to detail and free from defects impairing appearance, strength or durability. Contour outdoor horizontal glazing to minimize water ponding and ice or snow buildup.

- E. 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 weathertight. Ensure slip joints make full, tight contact and are weathertight.
- F. Reinforce components at anchorage and support points, at joints, and at attachment points for interfacing work.
- G. Glass: Accurately size glass to fit openings allowing clearances following recommendations of "Glazing Manual" published by Flat Glass Marketing Association.
- H. Cut glass clean and carefully. Nicks and damaged edges will not be accepted. Replace glass that has damaged edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify openings are ready to receive work and dimensions and clearances are as indicated on the approved shop drawings.
- C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install folding glass wall system in accordance with approved shop drawings and manufacturer's instructions.
- C. Separate dissimilar materials using nonconductive tape, paint, or other material not visible in finished work.
- D. Provide attachments and shims to permanently fasten system to building structure.
- E. Maintain dimensional tolerances and alignment with adjacent Work.
- F. Anchor securely in place, allowing for required movement, including expansion and contraction.
- G. Install glazing and sealants in accordance with manufacturer's instructions without exception, including surface preparations.
- H. Set sill members in bed of sealant. Set other members with internal sealants to provide weathertight construction.
- I. Install flashings, closures, corners, and other accessories as required or detailed.
- J. Clean surfaces and install sealant in accordance with sealant manufacturer's instructions and structure manufacturer's guidelines.

3.4 ADJUSTING AND CLEANING

- A. Adjust hinge sets, locksets, and other hardware for proper operation. Lubricate using a suitable lubricant compatible with door and frame coatings.
- B. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before owner's acceptance.
- C. Any abraded surface of the finish shall be cleaned and touched up with air dry paint, as approved and furnished by the window manufacturer, in a color to match factory applied finish.
- D. Remove from project site and legally dispose of construction debris associated with this work.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION