

## Section 08 39 19

### PERMANENT GLASS FLOOD BARRIERS

#### PART 1 GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

##### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Permanent glass flood barriers
  - 2. Exterior entrance systems.
  - 3. Exterior storefront systems.
- B. Related sections include the following:
  - 1. Division 7 Section "Building Insulation" for firesafing field installed in conjunction with glazed aluminum entrances and storefront system.
  - 2. Division 7 Section "Joint Sealants" for joint sealants installed as part of glazed aluminum entrances and storefront system.'
  - 3. Division 8 Section "Structural Glazed Aluminum Curtain Walls"
  - 4. Division 8 Section "Glazing"

##### 1.03 SYSTEM DESCRIPTION

- A. General: Provide (4) four sided structural glazed aluminum FLOOD PANEL system that has the following capabilities based on testing manufacturer's standard units in assemblies similar to those indicated for this project:
  - 1. Withstands loads, thermal and structural movement requirements indicated without failure.
    - a. Air infiltration and water penetration exceeding specified limits.
    - b. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.
- B. Flood Loads for flood barriers must meet those expressed by FEMA Technical Bulletin 3-93 for Non -Residential flood Protection and must be manufactured to US ARMY Corps Of Engineers 'Flood Proofing Regulations' to meet performance for Type 2 Closures as identified in Chapter 7, Section 701.1.1
- C. System must be able to be re-glazed from the exterior.
- D. Wind Loads: Provide glazed aluminum entrances and storefronts system, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of authorities having jurisdiction, and the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, " Analytical Procedure, " and the Florida Building Code 2000, whichever are more stringent.
  - 1. Design wind velocity at the project site is \_\_\_\_\_.
  - 2. Deflection of framing members in a direction normal to wall plain is limited to 1/175 of clear span or 3/4 inches, whichever is smaller, unless otherwise indicated.
  - 3. Deflection of framing members in a direction normal to wall plane is limited to 1/360 of clear span, 3/4 inches maximum, where plaster or gypsum board are subject to bending.
  - 4. Deflection of framing members overhanging an anchor point is limited to 2 times the length of the cantilevered member, divided by 175.

- E. Dead Loads: Provide glazed aluminum entrances and storefronts system members that do not deflect an amount, which will reduce glazing bite below 75 percent of design dimension when carrying full dead load. Provide a minimum 1/8-inch clearance between members and top of fixed panels, glazing or other fixed part immediately below. Provide a minimum 1/16-inch clearance between members and operable windows and doors.
- F. Live Loads: Provide structural glazed aluminum entrances and storefronts system, including anchorage, that accommodates supporting structure's deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.
- G. Air Infiltration: Provide glazed aluminum entrances and storefronts system with permanent resistance to air leakage through system of not more than 0.06 cfm/sq.ft. Have fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq.ft.
  - 1. Provide operable windows with permanent resistance air leakage complying with AAMA 101 requirements for types of windows indicated.
- H. Water Penetration: Provide glazed aluminum entrances and storefronts system that does not evidence water leakage when tested according to ASTM E 331 at minimum differential pressure of 25 percent of inward acting wind-load design pressure as defined by ASCE 7, "Minimum Design Loads for Buildings and other structures," but not less than 10 lbf/sq.ft.
- I. Thermal Movements: Provide glazed aluminum entrances and storefronts system, including anchorage, that accommodates thermal movements of system and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, noise or vibration and other detrimental effects.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- J. Structural Support Movement: Provide glazed aluminum entrances and storefronts system that accommodates structural movements including, but not limited to, sway, twist, column shortening, long-term creep, and deflection.
- K. Condensation Resistance Factor (CRF): Provide glazed aluminum entrances and storefront system with (CRF) of not less than 55 when tested according to AAMA 1503.1
- L. Average Thermal Conductance: Provide glazed aluminum entrances and storefronts system with an average U-value of not more than 0.66 Btu/sq.ft. x h x deg F when tested according to AAMA 1503.1
- M. Dimensional Tolerances: Provide glazed aluminum entrances and storefronts system, including anchorage that accommodates dimensional tolerances of building frame and other adjacent construction.

### **1.03.01 TESTING AND PERFORMANCE REQUIREMENTS**

- A. Provide Permanent Glass Flood Barrier System and application that is structurally sound, impact resistance and weather tight conforming to applicable testing and performance requirements described herein.
- B. Flood Loads for flood barriers must meet those expressed by FEMA Technical Bulletin 3-93 for Non -Residential flood Protection and must be manufactured to US ARMY Corps Of Engineers 'Flood Proofing Regulations' to meet performance for Type 2 Closures as identified in Chapter 7, Section 701.1.1
- C. Provide certified independent laboratory impact test reports from an accredited laboratory.
- D. Provide certification for compliance with Florida Building Code 2001 and Miami-Dade NOA
- E. Test Units: All tests, unless otherwise noted, shall conform to the **impact**, static, cyclic, air and water testes as set forth by FM (Factory Mutual)R Flood Mitigation Test Class Number 2510, and the Miami-Dade County Building Code Compliance. Test size shall exceed the maximum size used on the project in total square foot.(minimum size 60 X 84.

- F. Test Procedure and performance:
1. Storefront system shall conform to, and pass all tests performed by an independent testing laboratory accredited by Factory Mutual for conducting **impact**, static, cyclic air and water tests set forth by the Factory Mutual (FM) Flood Barrier Impact and Water Penetration test Class Number 2510 and the Miami-Dade County Building Code Compliance Office.
  2. Impact Test – PA 201-94 and 1-3023.2
    - a. Missile Impact storefront system with a solid S4S nominal 2 x 4, #2 surface dry, Southern Pine of not less than 8’-6’ in length and 9 lbs in weight at a velocity between 50 and 52 ft/sec. Without defined specimen failure.
  3. Cycle Wind Pressure Loading Test – PA203-94 and 302.4 – 302.7.3
    - a. Apply loads to the specimen using the cycles specified in The South Florida Building Code and as in Table 1 of SSTD 12-97 without failure.
    - b. Specified Design Pressure (DP) should not be less than 90 psf.

#### 1.04 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Site Specific Engineering, per FEMA Bulletin 3-93, signed and sealed by a Professional Engineer licensed in the state in which the work is being performed.
- C. Materials Impact testing, certified by an accredited testing laboratory acceptable to the Architect.
- D. Product Data for each product specified, including details of construction relative to materials, dimensions of components, profiles, silicone strength tests, and finishes.
- E. Detailed Shop Drawings showing fabrication and installation of glazed aluminum entrances and storefront system including plans, elevations, sections, details of components, and attachments to other units of Work.
  1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for initial selection in the form of manufacturer’s standard sizes. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- E. Samples for verification of each type of exposed finish required in manufacturer’s standard sizes. Where finishes involve normal color and texture variations expected.
- F. Cutaway sample of each vertical-to-horizontal intersection of system, made from 12-inch lengths of full-size components and showing details of the following:
  1. Joinery
  2. Anchorage
  3. Expansion provisions
  4. Glazing
  4. Flashing and drainage
- G. Welder Certificates indicating that welders comply with requirements specified in “ Quality Assurance “ Article.
- H. Installer certificates signed by installer certifying that installer comply with requirements in “ Quality Assurance “ Article.
- I. Manufacturer must submit Product Test Reports from a qualified independent testing agency evidencing compliance of glazed aluminum entrances and storefront system with requirements based on comprehensive testing of manufacturer’s current system.

## 1.05 QUALITY ASSURANCE

- A. Manufacturer must have 10 years minimum experience manufacturing the Permanent Glass Flood Barriers and be able to submit evidence of this to the architect's satisfaction.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of glazed aluminum entrances and storefront systems that are similar to those indicated for this Project in material, design, and extent.
- C. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing glazed aluminum entrances and glass flood barrier systems similar to those required for this Project and who is acceptable to the manufacturer.
  - 1. Engineering Responsibility: Engage a qualified professional engineer to prepare or supervise the preparation of data for glazed aluminum Aluminum entrances and storefront systems, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that shows systems' compliance with specified requirements.
- C. Source Limitations: Obtain each type of glazed aluminum entrances and storefront system from one source and by a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensions of glazed aluminum entrances and Permanent Glass Flood Barrier System and are based on the specific systems indicated.
  - 1. Project's basis of design is Savannah Flood Protection, Inc, Permanent Glass Flood Barrier System with Perimeter Dynamic Weather and Water Seal.
  - 2. Do not modify intended aesthetic effects, as judged solely by the architect, except with the Architect's written approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to the architect for review. The architect's determination is final.
- E. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code-Aluminum."
  - 1. Engage welders who have satisfactorily passed AWS qualification tests for welding processes involved and who are currently certified for these processes.
- F. Mockups: (Optional) Prior to installing glazed aluminum entrances and storefront system, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for work.
  - 1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by the Architect.
  - 2. Notify the Architect 7 days in advance of the dates and times when mockups will be constructed.
  - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 4. Obtain the Architect's approval of mockups before start of work.
  - 5. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
    - a. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed work.
- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

## **1.06 PROJECT CONDITIONS**

- A. Field Measurements: Verify dimensions by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Where field measurements cannot be made without delaying the work, General Contractor shall guarantee dimensions to the manufacturer, and fabrication shall proceed without field measurements. Coordinate construction to ensure that actual dimensions correspond to guarantee dimensions.

## **1.07 WARRANTY**

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Submit a written warranty executed by the manufacturer and installer, agreeing to repair or replace components of a glazed aluminum entrances and storefront system that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
  - 1. Structural failures including, but not limited to, excessive deflection
  - 2. Failure of system to meet performance requirements.
  - 3. Deterioration of meals, metal finishes, and other materials beyond normal weathering.
  - 4. Glazing breakage.
  - 5. Delamination.
- C. Warranty Period: 3 years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: The basis or design is the design of the section is Savannah Trims, Inc. phone 888-640-0850. Subject to compliance with requirements, design intent and these specifications, other manufacturers will be considered for these specifications subject to submission of all testing requirements and Laboratory Certification, a minimum of 20 calendar days prior to the project bid date.
- B. Other manufacturers that may be acceptable, subject to compliance with these specifications, must be submitted to the Architect or engineer responsible for executing the 'FLOOD PROOFING CERTIFICATE' AND receive prior written approval are:
  - 1. Alumiglass, Inc, Boca Raton, Florida, .
  - 2. Presray Corporation, Albany, New York

## 2.02 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.
  - 1. Sheet and plate: ASTM B 209
  - 2. Extruded Bars, Rods, Shapes, and tubes: ASTM B 221.
  - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
  - 4. Welding Rods and Bare Electrodes: AWS A5.10.
- B. Steel Reinforcement: ASTM A 36 for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 for hot-rolled sheet and strip.
  - 1. Provide only where required by manufacturer to meet engineering requirements.
- C. Glass: Shall be 'Flood Glass', manufactured to the specifications of Savannah Flood Protection consisting of two layers of 1/4 inch thick, heat - strengthened glass separated by a hi-bred laminated as specified by Savannah Flood Protection, that is designed to meet the performance specifications outlined in this specification.
- D. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, and shims or spacers; in hardness recommended by manufacturer.
- E. Glazing sealants and fillers as manufactured by Dow Corning specifically for this application.
- F. Framing system gaskets and joint fillers as recommended by Savannah Flood Protection, Inc.
- G. Sealants and joint fillers for joints within glazed aluminum entrances and storefront system as tested and approved by manufacturer.
- H. Firesafing materials as specified in Division 7 Section " Building Insulation."
- I. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil thickness per coat.

## 2.03 COMPONENTS

- A. Doors: Provide manufacturer's standard 1 ¾ - inch – thick glazed doors with minimum 0.125 – inch – thick, extruded tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie-rods.
  - 1. Glazing stops and gaskets: Provide manufacturer's standard snap-on extruded-aluminum glazing stops and performed gaskets.
  - 2. Stile Design: Medium stiles: 3 ½ - inch nominal width, with 4 ½ - inch center rail.
- B. Brackets and Reinforcements: Provide manufacturers' standard high-strength aluminum brackets and reinforcements. Provide nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-proof, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Finish exposed portions to match glazed aluminum entrances and storefront.
  - 1. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
  - 2. Where fasteners anchor into aluminum less than 0.125 inches thick, provide reinforcement to receive fastener threads.
  - 3. Use exposed fasteners with countersunk Phillips screw heads finished to match framing members, unless otherwise indicated.

- D. Anchors: 3-way adjustable anchors that accommodate fabrication and installation tolerances in materials and finish compatible with adjoining materials and recommended by manufacturer.
  - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.
- E. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.
- F. Weather Stripping: Manufacturers' standard replaceable weather stripping as follows:
  - 1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.
  - 2. Sliding Weather Stripping: Wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements.
- G. Hardware shall be manufacturers standard package unless specifically called out in the Finished Hardware section of these specifications.

## 2.04 FABRICATION

- A. General: Fabricate glazed aluminum entrances and storefront systems according to shop Drawings. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
  - 1. Fabricate components for screw – spline frame construction.
  - 2. Fabricate components for shear-block frame construction.
  - 3. Fabricate components for head – and sill-receptor frame construction with shear-block construction at intermediate horizontal components.
  - 4. Provide method(s) indicated above as standard with manufacturer for frame construction assemblies applicable to this Project.
- B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
- C. Prepare components to receive concealed fasteners and anchor and connection devices.
- D. Fabricate components so there are no joints in the metal framing that is exposed to the exterior. Only the glass face may be exposed to the flood waters.
- E. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld before finishing components. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- F. Glazing Pockets in doors: Provide minimum clearances for thickness and type of glass.
- G. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces finished paint, or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with zinc-chromate paint.
- H. Frame Units: Factory assembles frame units according to Shop Drawings to greatest extent possible. Rigidly secure nonmovement joints. Allow NO joints exposed to the exterior unless otherwise indicated to occur within framing members.
- I. Install glazing in the manufacturers shop, prior to shipment and according to Shop Drawings, using structural 'Face' glazing on the exterior of the support framing. Comply with requirements of Division 8 Section "Glazing," unless otherwise indicated.

## 2.05 ALUMINUM FINISHES

- A. General: Comply with NAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Finish Paint to be Powder Coat, or Kynar 500 50% minimum PVF, conforming to the system established by the Aluminum Association for designating aluminum finishes.
- D. Class I, Clear, or Bronze Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I clear coating 0.018mm or thicker) complying with AAMA 607.1.

## PART 3 EXECUTIONS

### 3.01 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of glazed aluminum entrances and storefront system. Do not proceed with installation until unsatisfactory conditions have been corrected or accommodations acceptable to architect have been made.

### 3.02 INSTALLATION

- A. General: Install product in openings prepared by the General Contractor to accept this application of Permanent Glass Flood Barrier System.
- B. Comply with manufacturer's written instructions for protecting, handling, and installing glazed aluminum entrances and storefront system. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight, unless otherwise indicated. Provide means to drain water to the exterior to produce a permanently weatherproof system.
- C. Perimeter of all openings must be protected against water pressure blow-in by manufacturers certified device as patented by Savannah Trims, Inc.
- D. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- E. Install components to drain water-passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
- F. Install framing members plumb and true in alignment with established lines and grades.
- G. Install factory-assembled frame units plumb and true alignment with established lines and grades.
- H. Anchorage: After system components are positioned, fix connections to build structure as indicated on Shop Drawings.
  - 1. Provide separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

- G. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- H. Install glazing according to Shop Drawings. Comply with requirements Of Division 8 Section "Glazing," unless otherwise indicated.
- I. Install sealant according to Shop Drawings. Comply with requirements of Division 7 Section "Joint Sealants," unless otherwise indicated.
- J. Install firesafing in locations indicated. Comply with requirements of Division 7 Section "Building Insulation," unless otherwise indicated.
- K. Erection Tolerances: Install pre-glazed aluminum entrances and storefront to comply with the following maximum tolerances:
  - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
  - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
  - 3. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch; where a reveal or protruding element separates aligned surfaces by less than 2 inches, limit offset to 1/2 inch.
  - 4. Location: Limit variation from plane or location shown on Shop Drawings to 1/8 inch in 12 feet; 1/2 inch over total length.
- L. Installer shall furnish certification, signed by an officer of the Company, certifying that all work is installed per the contract documents and the manufacturers shop drawings, and agreeing to the conditions and terms of the warranty.
- M. Installer shall maintain a daily work log for each day worked on the jobsite, noting manpower, installation progress, problems encountered and all other issues of note.
- N. Install entrances plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
  - 1. Install surface-mounted hardware according to manufacturers' written instructions.

### **3.03 PROTECTION**

- A. General Contractor shall provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that the Glass flood Barrier System, and the glazed aluminum entrances and storefront system is protected without damage or deterioration for the remainder of the project until the time of Substantial Completion.

END OF SECTION 08 39 19