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# SECTION 08390 WATERTIGHT DOORS

# Part 1. GENERAL

## 1.1 SECTION INCLUDES

A. Self-closing Flood Wall with frame and hardware.

# 1.2 RELATED SECTIONS

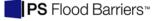
- A. Section 03300 Cast-In-Place Concrete.
- B. Section 04810 Unit Masonry Assemblies.
- C. Section 05120 Structural Steel.

# 1.3 REFERENCES

- A. ASTM A 36 Standard Specification for Carbon Structural Steel.
- B. ASTM A 167 Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- C. ASTM A 276 Standard Specification for Stainless Steel Bars and Shapes.
- D. ASTM B 26 Standard Specification for Aluminum-Alloy Sand Castings.
- E. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- F. ASTM B 211 Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- G. ASTM A 500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- H. AISI CL 304 American Iron and Steel Institute.
- I. Aluminum Association Specification for Aluminum Structures, 7th Edition.
- J. ASME Structural Welding Code Section IX.
- K. FEMA #114 Engineering Principles and Practices of Retrofitting Flood-Prone Residential Structures.
- L. FEMA Technical Bulletin 3-93 Non-Residential Flood Proofing.
- M. SEI/ASCE 7-02 Minimum Design Loads for Buildings and Other Structures.
- N. AWS D1.1 Structural Welding Code Steel.
- O. AWS D1.2 Structural Welding Code Aluminum.
- P. Aluminum Structures A Guide to Their Specifications and Design.

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Q. U.S. Army Corps of Engineers, EP 1165-2-314 - Flood Proofing Regulations, 15 December 1995.

## 1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Design watertight doors to perform under hydrostatic loads (and hydrodynamic or other loads as specified) to control short-term load pressures indicated. All water pressure loads and operating loads are transferred to the building structure.
- B. Standard loading: Standard Flood Barriers are designed for hydrostatic loading, and have no additional allowances included for hydrodynamic loads, wave loads or debris impact loads.
- C. Special loading: Design Flood Barriers for hydrodynamic loads, wave loads, debris impact loads, or other uniform loads as indicated.

## 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 instructions.
- C. Shop Drawings: Provide shop drawings showing layout, profiles, and product components, including anchorage, hardware, and finishes. Include dimensional plans, applicable material specifications, elevations and sections detailing mounting and connections, and load diagrams.
- D. Calculations: Submit calculations approved by a qualified engineer, to verify the flood barrier's ability to withstand the design loading.
- E. Closeout Submittals: Provide Operation and Maintenance data to include methods for maintaining installed products, precautions against cleaning materials and methods detrimental to finishes and performance.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer must demonstrate a minimum of five years successful experience in design and manufacture of similar flood related closures. Upon request, provide supporting evidence including list of installations, descriptions, name and method of contact.
- B. Welder Qualifications: Welders Certified in accordance with American Welding Society Procedures: AWS-1-GMAW-S, WPS No. B2.004.90 for applicable material used in production of specified product.

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Page 3 of 6 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging container with identification labels intact until ready for installation.
- B. Protect materials from exposure to moisture.
- C. Store materials in a dry, warm, ventilated weathertight location. If outdoor storage is required, block materials to store at an incline, to prevent pooling of any moisture and promote runoff. Tarp materials in a tent-like arrangement, elevated above the product with open sides to allow airflow. Store all other hardware in a dry controlled environment.
- D. Use caution when unloading and handling product to avoid bending, denting, crushing, or other damage to the product.
- E. When using forklifts, use forks of proper length to fully support product being moved. Consult shop drawings or consult with factory for proper lift points.

# 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 COORDINATION

A. Coordinate Work with other operations and installation of adjacent materials to avoid damage.

### Part 2. PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: PS DOORS, which is located at: 1150 S. 48th Street, Grand Forks, ND 58201; Toll Free Tel: 877-446-1519; Tel: 701-746-4519; Fax: 701-746-8340; Email: <u>4info@psdoors.com</u>; Web: <u>www.flooddoors.com</u>
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- D. Obtain all watertight doors and flood barriers assemblies from single manufacturer.

#### 2.2 EQUIPMENT

- A. Watertight Doors: Provide the following doors:
  - (1) Self-Closing Flood Wall: PS Doors Model SCFW-570.
- B. Products Details:
  - Sealing Requirements: Flood Barrier and gasket design shall provide an effective barrier against short-term high water situations, to the protection level indicated on Drawings.
  - (2) Operation: Provide with latching operable from one side only (typical).

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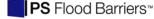
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- (3) Mounting/Load Transfer: Anchor to existing structure. Flood Barrier designed for specified hydrostatic pressure (and other loads as specified) and will transfer loads to adjacent structure.
- (4) Frames to be cast-in-place or anchored utilizing mechanical, chemical or other anchor types as designed. Manufacturer to include all anchors, water-stop, and sealants, as designed.
- (5) Loading Direction Selection:
  - a) Standard: Positive Pressure Loading: (Direction of loading against flood barrier so as to further compress gaskets against flood barrier frame-"seating").
  - b) Optional: Reverse Pressure Loading: (Direction of loading against flood barrier so as to force the flood barrier away from the flood barrier frame-"unseating").
- (6) Provide rectangular door opening with square corners to facilitate easy passage.
- (7) Provide compression gasket which requires no inflation.

## 2.3 MATERIALS

- A. Flood Barrier:
  - Steel: Structural or formed steel shapes conforming to ASTM A 36; tubing conforming to ASTM A 500 Grade B, ASTM A 513; bars conforming to ASTM A 36, M1020; of appropriate size and strength with welded construction.
  - (2) Stainless Steel: Stainless steel conforming to ASTM A 276.
  - (3) Aluminum: 6063 alloy conforming to ASTM B 211.
- B. Panel Sheeting: Flood Barrier to be sheeted with steel sheeting or plate, Commercial Quality-Low Carbon ASTM-A-569, ASTM-A-366, ASTM-A-36 welded in place. Optional
  - (1) Steel: Commercial Quality-Low Carbon steel conforming to ASTM A 569, ASTM A 366, ASTM A 36; of appropriate size and strength with welded construction.
  - (2) Stainless Steel: Stainless steel conforming to ASTM A 167, 304 or 316 alloy.
  - (3) Aluminum: 6063 alloy conforming to ASTM B 209
- C. Gaskets to be factory mounted to flood barrier assembly. Gaskets to be compressible rubber type, typically EPDM unless otherwise noted, and to be field replaceable.
- D. Frame to include jamb and sill members for field locating and installation on structure. Jamb members to be designed and fabricated with appropriate material as required for the loading.
  - (1) Steel: Structural or formed steel shapes conforming to ASTM A 36 of appropriate size and strength with welded construction.
  - (2) Stainless Steel: Stainless steel conforming to ASTM A 167 using 304 or 316 alloy.
  - (3) Aluminum: 6063 alloy conforming to ASTM B 26.
  - (4) Aluminum: 6061 alloy ASTM B 209.
- E. Threshold:
  - (1) Stainless Steel: Stainless steel conforming to ASTM A 276, 304 or 316 alloy.
  - (2) Aluminum: 6063 alloy conforming to ASTM B 26.
  - (3) Aluminum: 6061 alloy ASTM B 209.
- F. Frame Mounting Hardware: Provide anchors, sealant, and water stop, as required.
- G. Operating Hardware: Provide hardware sized for the size and weight of the flood barrier and loads. Hardware to be factory located on jambs and barrier panels, as practical. All

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loads are transferred to building structure. Latching hardware to be as indicated on Drawings. Flood barrier panel to be factory prepared for applicable latching devices.

- H. Steel Shop Finish: Apply in accordance with manufacturer recommendations and instructions.
  - (1) Primer: One shop coat of manufacturer's standard shop primer (S-W Kemflash Primer E61-R-26).
  - (2) Finish: Two shop coats of Standard Industrial Enamel (S-W Industrial and Marine Coatings B54 Series)
- I. Stainless Steel and Aluminum products to be mill finish, welds are ground smooth, not polished, and are factory acid washed, neutralized and rinsed.
- J. Labeling. Each watertight door and frame will be individually identified for matched installation.
- K. Instruction Placard: Provide pictorial and written operation instruction placards on flood barrier.

## 2.4 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### Part 3. EXECUTION

#### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

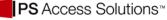
## 3.2 PREPARATION

- 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.

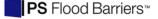
#### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's installations instructions, approved shop drawings, shipping, handling, and storage instructions, and product carton instructions for installation.
- B. Frames shall be installed level, square, plumb, and rigid.
- C. Sealants, water-stop, and grouting to be applied per product application directions and in accordance with manufacturer's instructions.

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- D. Field Grouting to be completed by appropriate personnel, and in accordance with product application directions and manufacturer's instructions.
- E. Tolerances: All dimensional requirements must be in accordance with manufacturer's installation instructions and shop drawings.
- F. Field Testing:
  - (1) Perform visual dry test for gasket alignment, continuity contact and precompression.
  - (2) Construct temporary water barrier and test installed flood barrier.

### 3.4 FIELD QUALITY CONTROL

- A. Products to be operated and field verified including the sealing surfaces to assure that they maintain contact at the correct sealing points.
- B. Verify that hinging and latching assemblies operate freely and correctly.
- C. Verify all anchorage is in accordance with manufacture's installation instructions and applicable data sheets.

### 3.5 CLEANING

- A. Repair or replace damaged installed products or components.
- B. Clean all sealing surfaces.
- C. Touch up damaged finish.

#### 3.6 PROTECTION

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

END OF SECTION

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