

SECTION 08390
WATERTIGHT DOORS

****Note to Specifier** This specification contains component and configuration options. Where indicated choose the appropriate choice for your specific project requirements. Delete specifier instructions prior to publishing completed specification.**

Part 1. GENERAL

1.1 SECTION INCLUDES

- A. MODEL: FH-540; Flood Hatch
- B. CONFIGURATION: Single Panel/Paired Panel

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 B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM B 211 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- C. ASTM A 36 - Standard Specification for Carbon Structural Steel.
- D. ASTM A 240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- E. AISI CL 304 - American Iron and Steel Institute.
- F. Aluminum Association - Specification for Aluminum Structures, 7th Edition.
- G. AWS D1.2 - Structural Welding Code - Aluminum.
- H. Aluminum Structures - A Guide to Their Specifications and Design.
- I. ASME Structural Welding Code Section IX.
- J. FEMA Technical Bulletin 3-93 - Non-Residential Flood Proofing.
- K. Aluminum Design Manual (Latest applicable edition).
- L. ACI American Concrete Institute (Latest applicable edition).
- M. AISC American Institute of Steel Construction (Latest applicable edition).

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- N. SEI/ASCE 7 (Latest applicable addition) Minimum Design Loads for Buildings and Other Structures.
- O. AWS D1.2 - Structural Welding Code - Aluminum.
- P. U.S. Army Corps of Engineers, EP 1165-2-314 - Flood Proofing Regulations, 15 December 1995.
- Q. FEMA #114 - Engineering Principles and Practices of Retrofitting Flood-Prone Residential Structures.
- R. ASCE 24 Flood Resistant Design and Construction (Latest applicable addition)

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Design watertight flood hatch to control short-term load pressure types as indicated. All water pressure loads and operating loads are transferred to the mounting structure.
****Note to Specifier** Delete loading types not required.**
 - (1) Hydrostatic Loading
 - (2) Hydrodynamic Loading
 - (3) Debris Impact Loading
 - (4) Wave Loading (Dynamic)
 - (5) Wave Loading (Impact)
 - (6) Wind Loading
- B. Margin of Safety: Engineer product to conform to the design requirements that are based on the latest adopted edition of the International Building Code (IBC), while including the application of the representative load combinations and appropriate equivalent safety factors as recommended by the following, but not entirely limited to, SEI /ASCE 7 & 24, FEMA (ref. IBC 2012), FM Global, AISC, ADM, and ACI.
- C. Water Density: Assume 64 pcf, unless otherwise noted on drawings.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer's data sheets on each product to be used, including:
 - (1) Storage and handling requirements and recommendations.
 - (2) 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: Upon signed finalization and approval of dimensions, mounting location material and configuration, and load requirements;

****Note to Specifier** Choose one (1) of the following statements.**

- (1) Engineering calculations are not required for this barrier.
- (2) Submit stamped calculations by a registered professional engineer from within the state or territory where the project will be constructed or substantially improved, to verify the flood door'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.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer must demonstrate a minimum of five (5) 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. Minimum Qualifications: Manufacturer must demonstrate compliance and certification of a Quality Management System administered by the International Organization for Standardization (ISO). Documentation of current certification status to be provided upon request.
- C. Welder Qualifications: Welders Certified in accordance with American Welding Society Procedures for applicable material used in production of specified product.

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 during storage.
- 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 indicated limits.

1.9 COORDINATION

- A. Contractor shall conduct site survey and provide to flood barrier manufacturer, prior to manufacturers' commencement of shop drawings, the actual site conditions of the mounting location, to include; material type, dimensions and configuration, interferences with mounting surface, or any other condition that may impact the ability of the flood hatch to be properly installed.
- B. Coordinate work with other operations and installation of adjacent materials to avoid damage.

Part 2. PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: PS INDUSTRIES INCORPORATED, which is located at: 1150 S. 48th Street, Grand Forks, ND 58201; Toll Free Tel: 887-446-1519; Tel: 701-746-4519; Fax: 701-746-8340; Email: 4psinfo@psindustries.com; Web: www.psindustry.com or www.psindustries.com
- B. Substitutions: Not permitted.
- C. Obtain all watertight barrier assemblies from single manufacturer.
- D. Manufacture to provide a One (1) Year Limited Warranty, from date of shipment.

2.2 EQUIPMENT

- A. Watertight Flood Hatch: Provide the following hatch:
 - (1) Flood Hatch: Model FH-540
- B. Products Details:
 - (1) Sealing Requirements: Flood Hatch and gasket design shall provide an effective barrier against short-term high water situations, to the protection level indicated on Drawings.
 - (2) Mounting/Load Transfer: Anchor to existing structure. Flood Hatch is designed for specified hydrostatic pressure (and other loads as specified) and will transfer loads to adjacent structure.
 - (3) 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.
 - (4) Loading Direction Selection:
 - **Note to Specifier** Choose type of loading for project requirements.**
 - a) Positive Pressure Loading: (Direction of loading against flood hatch panel so as to further compress gaskets against flood hatch frame, "seating").
 - b) Reverse Pressure Loading: (Direction of loading against flood hatch panel so as to force the flood hatch panel away from the flood hatch frame, "unseating").
 - (5) Provide rectangular opening with square corners to facilitate easy passage.
 - (6) Provide compression gasket which requires no inflation.

2.3 MATERIALS

- A. Flood Hatch Panel:
 - **Note to Specifier** Choose type of loading for project requirements.**
 - (1) Aluminum Alloy (6061)
 - (2) Mild Carbon Steel
 - (3) 304/316 Stainless Steel
- B. Gaskets to be factory mounted to flood hatch assembly. Gaskets to be compressible rubber type, UV resistant EPDM unless otherwise noted, and to be field replaceable.
- C. Frame members for field locating and installation on structure to be designed and fabricated with appropriate material as required for the loading.
 - (1) Aluminum of appropriate size and strength with welded or mechanical fastened construction.
- D. Frame Mounting Hardware: Provide anchors, sealant, and water stop, as required.

- E. Operating Hardware: Provide hardware sized for the size and weight of the flood hatch and loads. Hardware to be factory located on flood hatch panels, as practical. Latching hardware to be as indicated on Drawings. Flood Hatch panel to be factory prepared for applicable latching devices.
- F. Aluminum products to be mill finish, welds are ground smooth, not polished.
- G. Labeling. Each watertight flood hatch will be individually identified for matched installation.

2.4 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for shipment to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Supply components required for anchorage of fabrications.

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.
- D. Tolerances: All dimensional requirements must be in accordance with manufacturer's installation instructions and shop drawings.
- E. Field Testing:
 - **Note to Specifier** Choose testing method.
 - (1) Installer to perform visual dry test for gasket alignment, continuity contact and pre-compression.
 - (2) Installer to perform hose test of barrier to frame in accordance with manufacturer's standard Hose Test Procedure.
 - (3) Installer to construct temporary water barrier and test installed flood barrier.

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3.4 FIELD QUALITY CONTROL

- A. Products to be operated and field verified that sealing surfaces maintain contact at the correct sealing points.
- B. Inspect gaskets for damage, wear, and adhesion. Replace compromised gaskets immediately.
- C. Verify that latching assemblies operate freely and correctly.
- D. Verify all anchorage is in accordance with manufacture's installation instructions and applicable data sheets.
- E. Inspect installation sealants to ensure a watertight juncture.

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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