

SECTION 083919

WATERTIGHT DOORS

****Note to Specifier**** This specification contains component and configuration options.
Where indicated, choose the appropriate choice for your specific project requirements

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. **[Single Swing] [and] [Paired Swing with removable mullion]**, 90-minute, Fire Rated, FM Flood Door and Frame Systems.
2. Door Hardware.

B. Related Sections:

1. Division 03 – Cast-In-Place Concrete.
2. Division 04 – Concrete Unit Masonry
3. Division 05 – Structural Steel Framing.

1.2 SUBMITTALS

A. 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.

B. 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.

C. 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.

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1.3 CLOSEOUT SUBMITTALS

- A. Provide Operation and Maintenance data to include methods for maintaining installed products, precautions against cleaning materials and methods detrimental to finishes and performance.

1.4 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.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging container with identification markings 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 loose or high value components 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 "Approved for Construction" drawings or consult with factory for proper lift points.

1.6 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.

1.7 COORDINATION

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- A. Conduct site survey and provide to flood door manufacturer, prior to manufacturer's 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 door to be properly installed.
- B. Coordinate work with other operations and installation of adjacent materials to avoid damage.

1.8 WARRANTY

- A. Manufacturer's Standard Warranty: Product to be free from defects in material and workmanship for a period of one (1) year from date of shipment.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. 90-Minute Fire Door Assembly: Tested in accordance with UL10(c).
 - 1. Provide FM Global labeled flood barrier demonstrating ANSI/FM 2510 Approval for dynamic impact testing and hydrostatic testing meeting leakage requirements of less than 0.08 gallon per hour per linear foot of wetted perimeter over any 15-minute period.
 - a. Maximum Hydrostatic Water Protective Heights: Up to 3 feet.
 - b. Individual door leaf maximum size not to exceed 48 inches by 96 inches.
- B. Design flood resistance doors to support, solely or in combinations of, temporary super-imposed live loads as indicated below. All applied types of flood related loadings are transferred from the flood product barriers, solely or in combinations of, by mullion anchorage to structural floor slabs and/or jamb anchorage and direct pressure contact to structural walls or other structural elements.
 - 1. Hydrostatic Loading
 - 2. Wind Loading
- C. Engineering Code Practices: Engineer flood products to conform to the design requirements that are based on the latest adopted edition of the International Building Code (IBC). LRFD and/or ASD methodologies are applied as appropriate to align with specific project specifications and/or limited published material data.
- D. Water Density: 64 pcf, unless otherwise noted on drawings.

2.2 FIRE RATED, FM FLOOD DOOR SYSTEM

- A. Description: Hinged, 90-minute, fire rated, ANSI/FM 2510 flood door system including door frame, door panel, threshold, and door hardware.

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1. Approved Manufacturer: PS Flood Barriers™, which is located at: 1150 S. 48th Street, Grand Forks, ND 58201; Toll Free Tel: 877.446.1519; Email: 4info@psindustries.com; Web: www.psfloodbarriers.com or www.psindustries.com

- a. Basis of Design Product: Model: PD-522FFR FM.

2. Substitutions: Not permitted.

- B. Single Source Responsibilities: Obtain all watertight doors and flood protection barriers from single manufacturer.

2.3 EQUIPMENT

A. Products Details:

1. Sealing Requirements: Flood Door and compression 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 both sides.
3. Mounting/Load Transfer: Anchor to existing structure. Flood Door designed for specified hydrostatic pressure (and other loads as specified) and will transfer loads to adjacent structure.
4. Frames to be anchored utilizing mechanical, chemical or other framing methods as designed. Manufacturer to include all anchors, water-stop, and sealants, as designed.
5. Loading Direction:
 - a. Positive Pressure Loading, (direction of loading against flood door so as to further compress gaskets against flood door frame - "seating").
6. Provide rectangular door opening with square corners to facilitate easy passage.
7. Provide compression gaskets which do not require air inflation.

2.4 MATERIALS

A. Flood Door interior framing to be fabricated from the following type of material:

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

1. Steel: Commercial Quality-Low Carbon structural or formed shapes, tubing, and bars of appropriate size and strength with welded construction.
2. Stainless Steel: Type 304 No. 2b structural or formed shapes, tubing, and bars of appropriate size and strength with welded construction.
3. Stainless Steel: Type 316 No. 2b structural or formed shapes, tubing, and bars of appropriate size and strength with welded construction (when available).

B. Door Panel to be sheeted with sheeting or plate of the following type;

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

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1. Steel: Commercial Quality-Low Carbon steel of appropriate size and strength, structurally bonded.
 2. Stainless Steel: Type 304- [No. 2b] [No. 4] [No. 6] stainless steel of appropriate size and strength, structurally bonded.
 3. Stainless Steel: Type 316- [No. 2b] [No. 04] [No.06] stainless steel of appropriate size and strength, structurally bonded.
- C. Fire-rated gaskets to be factory mounted to flood door assembly. Gaskets to be compressible rubber type, typically silicone, neoprene, and EPDM, unless otherwise noted, and to be field replaceable. Gasket does not require air inflation.
- D. Door Frame to be manufactured of the same material type and finish as door panel. Frame to include jambs, header jamb, and threshold members for field locating and installation on structure. Jamb members to be designed and fabricated with appropriate material as required for the loading.
- E. Thresholds to be PS Flood Barriers™ proprietary threshold:
1. Aluminum: 6000 Series Alloy.
 - a. ADA Compliant threshold.
- F. Frame Mounting Hardware: Provide anchors, sealant, and water stop, as required.
- G. Operating Door Hardware: Provide hardware appropriate for the size and weight of the flood door and loads. Hardware to be factory located on jambs and door panels, as practical. Latching hardware to be as indicated on drawings. Flood door panel to be factory prepared for applicable latching devices.
1. Aluminum (AL689 finish) Hinge to be continuous type.
 2. Standard Latching/Locking Hardware: Interior; Von Duprin 98F series Rim exit device. Exterior; Von Duprin 996L Lever, classroom function. (Note: this hardware has been specifically chosen and tested on the PD-522FFR FM, substitutions require manufacturer's engineering review.)

**** Note to Specifier ** The following is offered as an option Delete if not required.**

3. Closer; Retrolock RDC4000, Heavy Duty Grade 1 (AL689 finish).

H. Finish:

**** Note to Specifier ** Choose finish type based on material specified.**

1. Steel Shop Finish: Apply the following paint system in accordance with manufacturer recommendations and instructions:
 - a. Primer: One shop coat of manufacturer's standard shop primer (S-W Kemflash Primer E61-R-26).
 - b. Finish: Two shop coats of Standard Industrial Enamel (S-W Industrial and Marine Coatings B54 Series)

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2. Stainless Steel:

- a. No. 2b, products to be mill finish, welds are ground smooth, not polished.
- b. No. 4 brushed, welds chemically passivated and cleaned.
- c. No. 6 polished, welds chemically passivated and cleaned.

- I. Door Panel Edge Finish to be seam sealed epoxy system.
- J. Labeling: Each watertight door and frame will be individually identified for matched installation.

2.5 FABRICATION

- A. Fit and factory 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.
- D. Conduct shop operational test with factory installed gaskets to verify flood door assembly components operate as designed and flood protective gasket alignment and contact surfaces interact as intended.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until mounting substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another subcontractor, notify Architect of uncompleted preparation before proceeding.
- C. Inspect opening for compliance with door manufacturer requirements. Verify opening conditions are within required tolerances.

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

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- A. Install in accordance with manufacturer's installation instructions, Approved for Construction drawings, shipping, handling, and storage instructions, and product carton instructions for installation.
 - 1. Fire-Rated Openings: Install according to NFPA 80.
- B. Frames must be installed level, square, plumb, and rigid.
- C. Perform light or chalk test for gasket alignment, continuity contact, and pre-compression prior to field grouting.
- D. Sealants, water-stop, and grouting to be applied per product application directions and in accordance with manufacturer's instructions, and "Approved for Construction" drawings.
- E. Field Grouting to be completed by appropriate personnel, and in accordance with product application directions, manufacturer's instructions, and "Approved for Construction" drawings.
- F. Tolerances: All dimensional requirements must be in accordance with manufacturer's installation instructions and "Approved for Construction" drawings.
- G. Products to be operated and field verified that sealing surfaces maintain contact at the correct sealing points.
- H. Inspect gaskets for damage, wear, and adhesion. Replace compromised gaskets immediately.
- I. Verify that latching assemblies operate freely and correctly.
- J. Verify all anchorage is in accordance with manufacturer's installation instructions and applicable data sheets.
- K. Inspect installation sealants to ensure a watertight juncture.

3.4 FIELD QUALITY CONTROL

- A. Field Testing:

****Note to Specifier** Choose testing method(s) required.**

- 1. Installer to perform hose test of door to frame in accordance with manufacturer's standard Hose Test Procedure.
- 2. Installer to construct temporary water barrier and test installed flood barrier under hydrostatic conditions.

3.5 CLEANING

- A. Touch-up, repair or replace damaged products or components before Substantial Completion.
- B. Clean all sealing surfaces.

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3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

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