

## SECTION 08 39 19 (MasterFormat 2004)

## WATERTIGHT DOORS (FLOOD BARRIERS)

**PART 1 GENERAL**

## 1.01 SECTION INCLUDES

- A. Specialty custom designed Flood Shields, factory assembled with frame(s) and hardware, in accordance with documentation.
  - 1. Lift-out Flood Barrier
  - 2. Hinged Flood Barrier
  - 3. Vertical Lift Flood Barrier
  - 4. Horizontal Sliding Flood Barrier
  - 5. Self-closing Flood Wall
  - 6. Pedestrian Flood Door – ADA Compliant

## 1.02 RELATED SECTIONS

- A. (ADD APPLICABLE SECTIONS)
- B. Alternates: Similar products of other manufacturers subject to A-E prior approval and must meet the requirements provided by this specification.

## 1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) - ASTM A36 Standard Specification for Carbon Structural Steel
- B. American Iron and Steel Institute (AISI) - AISI CL 304
- C. Aluminum Association (AA) "Specification for Aluminum Structures", 7<sup>th</sup> Edition.
- D. American Society of Mechanical Engineers (ASME) - ASME Code Section VIII, Div. 1, ASME Code Section IX
- E. FEMA Engineering Principles and Practices of Retrofitting Flood-Prone Residential Structures #114
- F. FEMA Technical Bulletin 3-93 Non-Residential Flood Proofing.
- G. American Society of Civil Engineers (ASCE) - SEI/ASCE 7-02 Minimum Design Loads for Buildings and Other Structures
- H. American Welding Society Structural Welding Code (AWS) - AWS D1.1, D1.2
- I. Aluminum Structures: "A Guide to Their Specifications and Design".
- J. Flood Proofing Regulations, U.S. Army Corps of Engineers, EP 1165-2-314, 15 December 1995.

## 1.04 SYSTEM DESCRIPTION

- A. Provide flood shields, which have been designed and manufactured to perform under hydrostatic loads (and hydrodynamic or other loads as specified) to control short-term load pressures indicated, and perform to manufacturers' criteria. All water pressure loads and operating loads are transferred to the building structure. Building structure design, capacity to accept loads from flood shields, and evaluation of loads and structure is by others.

## 1.05 SUBMITTALS

- A. General: Provide submittals in accordance with Conditions of the Contract.
- B. (OPTIONAL) Calculations: Submit calculations approved by a qualified engineer, to verify the flood shield's ability to withstand the design loading.
- 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. Installation: Provide installation instructions and drawings detailing installation procedure.
- 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.

#### 1.06 QUALITY ASSURANCE

- A. Experience: Manufacturer must demonstrate a minimum of Five (5) years successful experience in design and manufacture of similar flood related closures.
- B. Provide evidence to the effect, including list of installations, descriptions, name and method of contact shall be provided.
- C. 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.

#### 1.07 DELIVER, STORAGE, AND HANDLING

- A. Delivery
  - 1. Deliver materials in manufacturer's original, unopened, undamaged shipping container with identification labels intact.
- B. Storage
  - 1. Store all materials in a dry, controlled area to protect from elements and damage. If outdoor storage is required, block materials to store at an incline, to prevent pooling of any moisture and promote runoff.
  - 2. Do not tarp tightly, as this will entrap moisture. Instead, tarp materials in a tent-like arrangement, elevated above the product with open sides to allow airflow.
  - 3. Store all other hardware in a dry controlled environment.
  - 4. For additional questions on delivery, storage, or handling, contact the manufacturer at (800) 284-0623 or (701) 746-4519 or email to [4psinfo@psdoors.com](mailto:4psinfo@psdoors.com).
- C. Handling
  - 1. Use caution when unloading and handling product to avoid bending, denting, crushing, or other damage to the product.
  - 2. When using forklifts, use forks of proper length to fully support product being moved.
  - 3. Consult drawings or factory for proper lift points.

#### 1.08 WARRANTY

- A. Special Warranty
  - 1. Manufacturer warrants this product and components to be free from manufacturing defects for a period of One (1) year from date of shipment.

#### 1.09 MAINTENANCE

- A. Routine inspections and maintenance (Determined by owner).
- B. General housekeeping of Flood Shield immediate area.
- C. Immediate replacement or repair of damaged or missing components.

### **PART 2 PRODUCTS**

#### 2.01 MANUFACTURERS

- A. PS DOORS, 4212 Gateway Drive, Grand Forks, ND 58203; Toll Free (800) 284-0623, Telephone (701) 746-4519, Fax (701) 775-7415, [www.flooddoors.com](http://www.flooddoors.com) or approved equal, prior approval required.
- B. Substitutions not permitted.

#### 2.02 PERFORMANCE

- A. Products Details:
  - 1. Special loading: Standard Flood Shields are designed for hydrostatic loading, and have no additional allowances included for hydrodynamic loads, wave loads or debris impact loads. Flood Shields may be designed for hydrodynamic loads, wave loads, debris impact loads, or other uniform loads upon request.
  - 2. Sealing Requirements: Flood Shield and gasket design to provide an effective barrier against short-term high water situations, to the protection level indicated on drawings.
  - 3. Model/Trajectory of Operation Options:
    - a. Model: LO-510 "Lift-Out Flood Shield" (One piece or multiple panels)



- b. Model: HSS-550 “Hinged Swing Flood Shield, Single Swing”
  - c. Model: HPS-555 “Hinged Swing Flood Shield, Paired Swing”
  - d. Model: VL-580 “Vertical Sliding Flood Shield”
  - e. Model: HS-560 “Horizontal Sliding Flood Shield”
  - f. Model: PD-520 “Hinged Pedestrian Flood Door” – ADA Compliant.
  - g. Model: SCFW-570 “Self-Closing Flood Wall”
4. Operational Requirement: Latching operable from one (1) side only (typical).
  5. Mounting/Load Transfer: Anchor to existing structure. Flood Shield designed for specified hydrostatic pressure (and other loads as specified) and will transfer loads to adjacent structure. 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, for bolt-in place applications.
  6. Loading Direction Selection:
    - a. Positive Pressure Loading: (Direction of loading against flood shield so as to further compress gaskets against flood shield frame—“seating”).
    - b. Reverse Pressure Loading: (Direction of loading against flood shield so as to force the flood shield away from the flood shield frame—“unseating”).
  7. Material requirements: See Section 2.03 COMPONENTS.
- B. Design Safety Factor for all Flood Shield Models of a minimum 2:1. Based on material yield strengths.
  - C. Design Safety Factor for Anchors, minimum of 4:1 for Cast-in-place (CIP), or minimum of 6:1 for Concrete Masonry Unit (CMU).
  - D. Provide rectangular door opening with square corners to facilitate easy passage.
  - E. Provide compression gasket which requires no inflation.

## 2.03 COMPONENTS

### A. Attributes

1. Panel Structure: Flood Shield to be fabricated from structural or formed steel shapes, ASTM A36; tubing, ASTM-A-500 Grade B, ASTM-A-513; bars, ASTM-A-36, M1020; of appropriate size and strength, welded construction. Optional materials include Stainless Steel (304 or 316) or Aluminum (6061).
2. Panel Sheeting: Flood Shield to be sheeted one side with steel sheeting or plate, Commercial Quality-Low Carbon ASTM-A-569, ASTM-A-366, ASTM-A-36 welded in place. Optional materials include Stainless Steel (304 or 316) or Aluminum (6061).
3. Gaskets to be factory mounted to flood shield assembly. Gaskets to be compressible rubber type, typically EPDM unless otherwise noted, and to be field replaceable.
4. Frame to include jamb, head, and sill members for field locating and installation on structure. Jamb members to be formed from appropriate gauge steel as required for the loading, ASTM A36. Optional materials include Stainless Steel (304 or 316), or Aluminum (6061). Threshold to be formed from Stainless Steel (304 or 316), Aluminum (6061) or as referenced in drawings. Frame to be installed as recommended by manufacturer and in accordance with manufacturer’s installation instructions and drawings.
5. Frame Mounting Hardware includes anchors, sealant, and water stop, as designed and provided for by manufacturer.
6. Operating Hardware: To be custom sized for the size and weight of the flood shield and loads. Hardware to be factory located on jambs and shield panels, as practical. All loads are transferred to building structure. Latching hardware to be as indicated on drawings. Flood shield panel to be factory prepared for applicable latching devices.
7. Finish on all exposed surfaces to be one (1) shop coat of manufacturer’s standard shop primer (S-W Kemflash Primer E61-R-26), and two (2) coats of Standard Industrial Enamel (S-W Industrial and Marine Coatings B54 Series) applied in accordance with manufacturer recommendations and instructions. (Note: Touch up of finish will be required as scratches will occur during shipment, handling, and installation. Optional Finish of “Power Coat” is available. Stainless Steel and Aluminum products to be mill finish, welds are ground smooth, not polished, and are factory acid washed, neutralized and rinsed.
8. Labeling. Each flood shield and frame will be individually identified for matched installation.

9. Instruction Placard: Provide pictorial and written operation instruction placards on flood shield.

#### 2.04 SOURCE QUALITY CONTROL

- A. Obtain flood shields assemblies from single manufacturer.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Compliance: Comply with all manufacturer's product data, including installations instructions, reference drawings, shipping, handling, and storage instructions, and product carton instructions for installation.

#### 3.02 INSTALLATION/APPLICATION

- A. Flood Shield Installation
  1. Install Flood Shield in accordance with manufacturer's installation instructions, shop drawings, and details. Frames shall be installed level, square, plumb, and rigid. Required tolerances to be no greater than 1/16" variation over entire length of frame members or sill member.
  2. Sealants, water-stop, and grouting to be applied per product application directions and in accordance with manufacturer's instructions.
  3. Field Grouting to be completed by appropriate personnel, and in accordance with product application directions and manufacturer's instructions.
- B. Tolerances
  1. All dimensional requirements must be in accordance with manufacturer's installation instructions and shop drawings.
- C. Effectiveness
  1. Effectiveness of the sealing capacity will be dependant upon the proper installation of the flood shield, frame and sill members, the adjacent structure, the care and maintenance of the flood shield and gaskets, and the placement/closure of the flood shield in time of need.
  2. Field Testing: Perform visual dry test for gasket alignment, continuity contact and pre-compression, or construct temporary water barrier and test installed flood barrier.

#### 3.03 FIELD QUALITY CONTROL

- A. Installation: Product to be installed using good general construction methods and practices, in accordance with manufacturer's instructions and drawings.
- B. Field Tests/Installation Verification:
  1. Products to be operated and field verify the sealing surfaces maintain contact at the correct sealing points.
  2. Hinging and latching assemblies operate freely and correctly.
  3. Verify all anchorage is in accordance with manufacture's installation instructions and applicable data sheets.

#### 3.04 CLEANING

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

#### 3.05 PROTECTION

- A. Protect installed product and finish surfaces from damage during handling, storage, and installation.
- B. Protect installed product and finish surfaces during normal and general operation.