

SECTION 10 71 19

FLOOD BARRIERS

****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. Bottom Hinged Flood Barriers with Basin.

B. Related Sections:

1. Division 03 – Cast-In-Place Concrete.
2. Division 04 – Concrete Unit Masonry

1.2 SUBMITTALS

A. 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 for approval.

1. Contractor to provide manufacturer with field measurements and mounting structure prior to commencement of shop drawings.

C. Factory Testing Documentation: Furnish independent party witnessed factory testing documentation of the same model/type flood barrier demonstrating a maximum leakage rate of 0.040 gallon per hour per linear foot of wetted perimeter, tested in accordance with the procedure set forth by the American National Standard for Flood Mitigation Equipment in ANSI/FM Approvals 2510-2020 section 4.3.3 for a minimum of 22 hours. Maximum leakage rate shall be published as the greater of the leakage rates recorded at both 10% and 100% of the maximum test water height.

D. Calculations: Upon receipt of signed Approval Drawings.

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

1. Engineering calculation submittal is not required for this barrier.
2. Submit calculations approved by a qualified engineer, to verify the flood barrier's ability to withstand the design loading.
3. 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 barrier's ability to withstand the design loading.

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

- A. Conduct site survey and provide to flood barrier 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 barrier 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. Design flood resistant barriers to withstand the types of short-term flood loads indicated on "Approved for Construction" drawings. Design loads may include hydrostatic, hydrodynamic, debris impact, wave, and wind loading. All flood related loadings are transferred from the flood resistant barriers to the adjacent mounting structure.
- B. Engineer Code Practices: Engineer flood resistant barriers to meet the requirements of the latest published edition of applicable design codes.

2.2 BOTTOM HINGED FLOOD BARRIER

- A. Description: Bottom Hinged Flood Barrier including panel, basin, jambs, and hardware.
 - 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: 4psinfo@psindustries.com; Web: www.psfloodbarriers.com or www.psindustries.com
 - a. Basis of Design Product: Model: BH-590.
- B. Substitutions: Not permitted.
- C. Single Source Responsibilities: Obtain all flood resistant barriers from single manufacturer.

2.3 EQUIPMENT

- A. Provide the following flood barriers: PS Flood Barriers' Model BH-590.
1. Passive deploying flood barrier; pivots upward automatically prior to flood water reaching ground level. No human intervention or electricity required.
- B. Products Details:
1. Flood barrier classifications: "Point-of-use" and "Passive"
 2. Loading direction: Positive Pressure Loading, (direction of loading against flood barrier so as to further compress gaskets against flood barrier frame - "seating").
 3. Flood barrier installation to not restrict rough opening of building structure. Provide rectangular, rough opening with square corners to facilitate easy passage
 4. Flood barrier components that are installed below ground are to extend no greater than 8.5 inches below finished floor level.
 5. Provide jambs at each end of barrier that do not protrude greater than 10 inches from existing wall surface [wing walls not acceptable].
 6. Flood barrier in stored position shall provide a flush surface with the finished floor level, meet ADA walking surface requirements, non-slip surface finish that can be field maintained/refurbished.
 7. In stored position barrier assembly to withstand HS-20 vehicle loading.
 8. Sealing Requirements: Flood Barrier and perimeter gasket design shall provide an effective barrier against short-term high-water situations, to the protection level indicated on Approval Drawings.
 9. Flood gasket to be factory mounted, continuous, field inspectable and replaceable without special knowledge. Gasket shall not require air inflation.
 10. All flood gasketing to be vandal-resistant and out of reach of pedestrians when barrier is in stored position.
 11. Provide plumbing connection in basin to supply flood water to automatic deployment devices and enables draining of water in non-flood events.
- C. Flood Barrier deployment
1. Barrier to activate automatically into a fully deployed (vertical) position prior to flood water reaching ground level.
 2. Barrier to remaining in fully deployed (vertical position) throughout flood event so that fluctuating water loads do not induce barrier movement and leakage.
 3. Barrier panel to be counterbalanced to be capable of manual operation between stored and deployed position.
- D. Post-installation testing and seasonal inspection of automatic (passive) deployment:
1. Automatic (passive) deployment shall be capable of being tested without constructing temporary above ground cofferdam/retaining wall to max flood elevation.
 2. Automatic (passive) deployment shall be tested and validated by filling below ground basin with simulated flood water. Flood barrier panel shall passively deploy to full vertical position prior to flood water reaching ground level.
- E. Available Product Options:

****Note to Specifier** Choose any combination of the following add-on equipment (add-ons maintain functionality of standard equipment). All options to be field installed by a systems integrator for the**

project. Operating sequences and uses of these devices will be determined by the EOR or Systems Integrator.

1. Local Pre-Deployment Warning Devices: Light, Horn, Float Switch.
2. Electronic Position Sensors: Feedback Position Down & Feedback Position Up.
3. On-Demand Electronic Deployment Device

2.4 MATERIALS

- A. Flood barrier panel, basin, and jambs to be the following material type:
 1. Aluminum: 6000 and 5000 series alloy
- B. Flood barrier activation/deployment components to be of the following material type:
 1. Stainless Steel: Type 304 or 316
- C. Gaskets Material: UV stable EPDM, neoprene or rubber type unless otherwise noted.
- D. Frame Mounting Hardware: Provide anchors, installation leveling rods, sealant, and water stop, as required.
- E. Finish:
 1. Aluminum products to be mill finish, interfering welds are ground smooth, not polished.
 - a. Concrete contact surfaces are factory coated to isolate aluminum from direct contact.
 - b. Top traffic surface coated with non-skid, textured, rubberized coating. Tested to ASTM-F-609 for friction coefficient and ASTM-F-510 for Wear Testing. Field maintainable surface.
 2. Stainless Steel parts to be mill finish, interfering welds are ground smooth, not polished.
- F. Compliant with Federal Acquisition Regulation (FAR) – Subpart 25.2 – Buy American-Construction Materials (BAA).
 1. The end-product or construction material must be manufactured in the United States; **and**
 2. A certain percentage of all component parts (determined by the cost of the components) must also be mined, produced, or manufactured in the United States, a requirement known as the “domestic content test”.
 - a. For an end-product or construction material that consists wholly or predominantly of iron or steel or a combination of both, the cost of foreign iron and steel must constitute less than 5 percent of the cost of all the components.

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, unless otherwise noted.
- D. Conduct shop operational test with factory installed gaskets to verify flood panel 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 barrier 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

- A. Install in accordance with manufacturer's installation instructions, "Approved for Construction" drawings, shipping, handling, and storage instructions, and product carton instructions for installation.
- B. Frames must be installed level, square, plumb, and rigid.
- C. Basin and Jambs to be anchored utilizing mechanical, chemical or other anchor methods as designed. Manufacturer to include all anchors, water-stop, and sealants, as designed. All anchorage is to be in accordance with manufacture's installation instructions and applicable fastener data sheets.
- 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. Prior to field concrete or grout work, perform operational test of product to verify installation tolerances, alignment, proper operation of flood barrier.
- F. Field Grouting to be completed by appropriate personnel, and in accordance with product application directions, manufacturer's instructions, and "Approved for Construction" drawings.

- G. Tolerances: All dimensional requirements must be in accordance with manufacturer's installation instructions and "Approved for Construction" drawings.
- H. Verify that barrier and deployment devices operate freely and correctly.
- I. Inspect flood gaskets for damage, wear, and adhesion. Replace compromised gaskets immediately. Ensure gaskets make continuous contact with the intended sealing surfaces.
- J. Inspect installation sealants to ensure a watertight barrier.

3.4 FIELD QUALITY CONTROL

A. Field Testing:

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

- 1. Installer to testing all automatic deployment features and functionality of add-on equipment.
- 2. Installer to perform hose test of panel to frame in accordance with manufacturer's standard Hose Test Procedure.
- 3. 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.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION