TRADEMARK HARDWARE
WORLD OF QUALITY HARDWARE

Flood Barrier
Product Specification Sheet

1.1 SUMMARY

Furnish and install engineered flood barrier panel system including but not limited to following:

- Removable panel assemblies.
- Anchors and through bolts for panel installation.
- Waterproof sealant and grout.
- Panel accessories.

1.2 WORK INCLUDED

- Product engineering and fabrication techniques shop drawings.
- Factory fabrication of aluminum flood barriers.
- The finish of flood barrier assembly.

1.3 RELATED WORK

- Section 07600 Flashing and Sheet Metal
- Section 07900 Joint Sealers

1.4 REFERENCES

- FEMA Technical Bulletin 3-93 Non-Residential Floodproofing
- FEMA Floodproofing Non-Residential Structures #102
- FEMA Design Manual for Retrofitting Flood-Prone Residential Structures #114
- NFIP Title 44US Code of Federal Regulations, Section 60.3
- ASTM B209 – Specification for Aluminum Alloy, Sheet and Plate.
- ASTM B221 – Aluminum and Aluminum-Alloy extruded bars, rods, wire, shapes, and tubes.
- ASME Structural Welding Code Section IX
- AWS Structural Welding Code D1.1
- American Architectural Manufacturers Association (AAMA) 501, 603.8, 605.2, 607.1
- NFIP Title 44 US Code of Federal Regulations, Section 60.3
- FIRM (Flood Insurance Rate Map)
- ASCE 24-98, ASCE/SEI 24-05
- All applicable federal, state and municipal codes, laws and regulations for exits.

1.5 QUALITY ASSURANCE

- All surfaces to receive Flood Barriers shall be smooth, plumb, true and level before installing.
- Provide for a flood barrier and application that is structurally sound, impact resistant and conforming to applicable performance requirements.
- All Barrier heights shall be finished to 12" above BFE (Base Flood Elevation).
- Provide Flood Proofing Certification for compliance and approval.
- Supervision: Arrange for product manufacturer's technical representative to provide the following services:
    1. Meet and discuss installation procedures and unique conditions on site.
    2. Inspect substrate surfaces and recommend solutions to accommodate adverse conditions.
    3. Periodically visit and inspect the installation and report unsatisfactory conditions to Contractor.
    4. Attend final inspection and to submit written certification that Products, systems, and assemblies have been installed in accordance with manufacturer 's requirements.

1.6 SEEPAGE

Requirements for aluminum flood barriers, terminology, tolerances, standards of performance and workmanship are those specified as Type 2 Closures in Chapter 7, Section 701.1.1 of the US Army Corps of Engineers 'Flood Proofing Regulations'. These Type 2 Flood Closures/ Barriers will allow 'Slight Seepage' during hydrodynamic and hydrostatic pressure flood conditions. Seepage amounts will vary with conditions encountered. This issue should be addressed by design professional and usage of sump or bilge type pumps should be used to offset potential water build-up.

1.7 PERFORMANCE REQUIREMENTS

- **General:** Design, fabricate, assemble and erect flood barrier panel assemblies, and interfacing conditions with continuous work, to ensure continuity of building the enclosure and that all segments of the assemblies will be free from leakage. In addition to the specified performance requirements, flood barrier panel assemblies shall conform to, or exceed the requirements of the applicable building code and referenced industry standards for operating forces, deflection and deformation under load.
- **Engineering criteria:** The manufacturer for flood barrier panel assemblies shall employ the services of a qualified structural engineer, registered to practice in the State of Florida, to prepare all calculations and other performance criteria for the respective systems, and bear all costs, therefore. All shop drawings for the components of the respective systems shall bear the registration stamp of the engineer.
- **Design:** Flood barrier panel assemblies shall provide a minimum 2:1 factor of safety based on the yield strength of materials and provide an effective seal against anticipated flood level.

- **Performance**
  - **Hydrostatic Pressure Resistance** – Flood Barriers shall conform to criteria for resisting lateral forces due to hydrostatic pressure from Free Standing Water as set forth by FEMA Technical Bulletin 3-93.
  - **Hydrodynamic Force Resistance** - Flood Barriers shall conform to criteria for resisting lateral forces due to moving flood waters at a minimum velocity of 8 ft. per second unless otherwise noted, as set forth by FEMA Technical Bulletin 3-93.
  - **Debris Impact Force Resistance** - Flood Barriers shall conform to criteria for resisting a 1000 lb. an object at the minimum velocity of 8 ft. per second unless otherwise noted, as prescribed by FEMA Technical Bulletin 3-93.
- **Egress**: Provide for a fully removable system including all frame, sill, and jamb assembly members. Permanent sub-frame assemblies shall be non-removable.
- **Manufacturing Criteria:** The manufacturer shall have a minimum of 5 years' history and experience in this product line.
- **Testing Requirements:** Provide manufacturer's testing and submit test data showing compliance with specified requirements for largest anticipated flood barrier panel assemblies. Demonstrate compliance with specified requirements.
- All welds in the potential "leak path" shall be liquid penetrant inspected in accordance with Appendix VIII of Section VIII Div. 1 of ASME Code.
- Proof test and leak test all inflatable seals per manufacturer's instructions.
- Finished assembly, or assembly similar in design, shall be factory leak tested to verify that it will withstand the design pressure.
- Provide certification from an independent testing laboratory indicating satisfactory test results showing compliance with design pressures.

1.8 SUBMITTALS

1. **Literature:** Manufacturer's product data sheets, specifications, fabrication methods, finishes, performance data, and installation instructions for each item furnished hereunder.
2. **Warranty**: Provide sample copies of manufacturer's' actual warranties for all materials to be furnished under this Section, clearly defining all terms, conditions, and time periods for the coverage thereof.
3. **Shop drawings:**
   a. 1/4 inch scale elevations and plans of each flood barrier panel assembly condition.
   b. Large scale design details of flood barrier panel assemblies; indicating sizes, types, and gauges of all

components; indicating types and thickness of bracing and stabilizing members; attachment clips and brackets; and complete installation details.

1.9 WARRANTY

- Stating that flood barriers for above project will be free from defects and workmanship for a period of three years from the date of substantial completion.

1.11 STACKABLE ALUMINUM FLOOD BARRIERS FOR DOORS

- Stackable Flood Barriers for doors are designed to restrain the force of water and debris by means of structural extruded members in a compression set against a smooth substrate utilizing rubber gasket seals in either an inset or face mounted application.
- Flood barriers shall be specifically engineered and designed to meet a minimum safety factor based on yield strength to provide an effective seal against site specific and specified flood forces.
- Building Contractor shall provide for onsite storage of removable flood barrier system for quick access.

1.12 CLEANING, PROTECTION, AND STORAGE

- When not used, remove the panel from the brackets. Clean all exposed surface from dirt, mud, etc. Make sure the gasketing seal is clean and dry. Store in a cool dry area with no weight against the rubber part.
- No special maintenance required for the brackets. Check and clean periodically.
- Inspect and repair all gasketing seals for optimum performance.
- Flood barrier shields and closures, to ensure that they fit properly and that the gaskets and seals are in good working order, properly labeled and stored as indicated in the Flood Emergency Operation Plan.

1.13 FIELD MEASUREMENTS

- Verify that field measurements are as indicated on shop drawings.

1.14 MATERIALS

- Extruded aluminum structural frame members, support angles, and mullions shall be 6063-T6 alloy and temper and not be less than 1/8" wall thickness.
- Aluminum sheet skin shall be 3003-H 16 alloy and temper and not less than 1/8" wall thickness on the exterior sheet and not less than 0.024" on the interior sheet.
- Extruded aluminum brace plates shall be 6063-T6 alloy and temper and not be less than 1/8" wall thickness.
- Gaskets to be factory mounted to flood panel assembly on sides and bottom of the panel. Gaskets to be compressible EPDM rubber type, field replaceable.

- Fasteners: Anchor bolts shall be Type 304 stainless steel.
- Sealants: Use only sealants that are compatible with all substrates and field applied in accordance with the manufacturer's recommendations.

1.15 FLOOD BARRIER PANELS

General: Solid removable flood barrier for single or double door applications engineered to withstand hurricane forces and floodwater hydrostatic impacts. Panels shall be engineered to the full "designed flood elevation" (height required), and edged with a rubber gasket. Panels are connected to the floor and sides of each opening or each other by pre-installed anchors and through-bolts.

1. Flood barriers shall be engineered and designed to meet a minimum safety factor based on yield strength to provide an effective seal against site specific and specified flood forces.
2. Anchors to be the permanent drop-in threaded type, accommodating installation and removal as required.
3. Provide panel and frames in heights indicated on the Drawings.
4. Finish: Mill finish aluminum

1.16 FABRICATION

1. Fabricate flood barriers to comply with requirements indicated for engineering, design, dimensions, materials joinery, and performance. Assemble flood barriers at manufacturer's factory. Assemble in the largest possible sections per job site conditions and clearly mark units for reassembly assuring a coordinated installation.
2. Fabricate frames including integral sills to fit in openings of the size indicated with allowances for fabrication and installation tolerances of barriers, adjoining construction and perimeter rubber gasket joints.
3. Supports, anchorages and accompanying accessories required complete assembly to be supplied by installing contractor.

1.17 EXAMINATION

1. Verify that opening sizes and tolerances are acceptable and in compliance with these specifications and applicable codes.
2. Beginning of installation means acceptance of existing conditions.

1.18 INSTALLATION

- All surfaces where Flood Barrier Shield will be installed shall be smooth, plumb and level before installation can begin.

Flood Barrier
Product Specification Sheet

- After properly preparing the openings, install flood barriers per the installation instructions.
- Attach only to smooth surfaces providing for proper and compatible infill for gaps in the substrate. Existing slabs and walls adjacent to openings where flood barriers are to be installed shall be given a waterproof sealer surface treatment prior to installation of flood barriers by the building contractor.
- Install true and plumb without warping or racking.
- Apply appropriate sealants where indicated on shop drawings and in accordance with manufacturer's recommendations.
- Supports, anchorages and accompanying accessories required complete assembly to be supplied by installing contractor.