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**Section 08316**

**Removable Aluminum**

**Flood Panels**

* PART 1 GENERAL
* 1.01 Description and general notes
  + Work Included:
    - Product engineering and fabrication techniques, shop drawings, structural calculations, and Professional Engineering Stamps in accordance with the FEMA design manual requirements for Non-Residential Flood proofing.
    - Factory fabrication and installation of aluminum flood barriers.
    - Finish of flood barrier assembly.
    - Provide flood barrier(s) factory assembled with frame(s) and hardware in accordance with the contract documents.
    - All Barrier heights shall be finished to 12” above Base Flood Elevation (BFE) unless otherwise stated by the Architect or Engineer of Record (EOR)
    - BFE and Building Sub Elevations shall be furnished to Barrier Manufacturer by the Architect or Engineer of Record.
  + The structural design of these Removable Flood Panels is generic and has been designed for hydrostatic, hydrodynamic and impact debris flood loads with water pressures corresponding to maximum water height and flow speed of 8 ft/sec. up to 10 ft/sec. to certify minimum required flood elevation to top of Flood Panels.
  + It shall be determined, on a job-by-job basis, the required Panel height and flow speed not to exceed 10 ft. /sec. for the design of Removable Flood Panels, based on FEMA's criteria (See Note #3) as well as per ASCE 24-14 Standard. Installation and construction of these Flood Panels for use within flood hazard areas shall be in accordance with the American Society of Civil Engineers Flood Resistant Design and Construction Standard SEI/ASCE 24-14.
  + Design criteria is for Type 2 Closures in chapter 7, section 70 1.1.2 of the Army Corp of Engineers, EP 1165-2-314 12/1195 and based on the 2018 Edition of the International Building Code, the corresponding provisions of ASCE 24-14, FEMA flood proofing non-residential structures manual FEMA 102, FEMA P-936 and FEMA Technical Bulletin 3-93. Design flood loads have been determined in accordance with ASCE 7-22. Design wind loads have been determined in accordance with ASCE 7-22 for 180 mph Basic Wind Speed for category 2 building. This flood barrier design criteria are for buildings in an "A" or "AE" flood zone and is not to be used in a Coastal "A" zone or high velocity "V" zone.
  + Flood barriers shall not be installed within areas where ice flows or ice jams occur.
  + Flood barrier design has been tested by an independent testing lab for water infiltration in accordance with FEMA 102 manual for flood proofing of non-residential structures, specifications Section 8, Page 70. Type 2 Flood closures or barriers are permitted at allowable seepage rates. Seepage amounts will vary with building conditions encountered. ASCE 24-14 chapter 6 states "sump pumps shall be provided to remove water accumulated due to any passage of vapor and seepage of water during the flooding event." Owner acknowledges and is responsible for all drains, piping and sump pumps required to meet ASCE 24-14 requirements to offset water build up behind the barrier system. These materials and equipment are not provided by Flood Panel.
  + Flood Panel manufacturers install and use gaskets and approved sealants following all the recommendations and specifications of the manufacturers respectively.
  + Owner, General contractor, or installer to verify all dimensions, wall and floor conditions at site before proceeding with the work and shall notify this engineer if any discrepancy is found that would alter the structural design of these Flood Panels.
  + Existing slabs and walls adjacent to the opening where Flood Panel is to be installed shall be given a surface treatment by means of waterproof sealer before flood Panel is installed. Surface must be smooth, square, plumb, and level.
  + Existing slabs and walls adjacent to openings where Flood Panels are to be installed shall be structurally designed by engineer of record, to sustain the same hydrostatic, hydrodynamic and impact pressures that correspond to maximum water elevation above finished floor at top of Panel, based on criteria mentioned on Note #3.
  + Drop-in anchors embedded into concrete for removable support installation shall be covered with a cap or similar device to protect their inside hold from dust, so that machine screws can easily be installed at time of flood warning. Concrete anchors by others.
  + Separation of Panel to window/door shall be measured from back of Panel to window/door including any knob, handle, or protruding device, and shall be 2" minimum.
  + All aluminum extrusions to be 6061-T6 alloy ,6063-T6 alloy, and 6005-T6 alloy.
  + All sheet metal screws shall be manufactured by ITW/Buildex "TEK Screws", and to be made of non-corrosive material.
  + All bolts to be galvanized steel ASTM A-307 designation or 304 Series Stainless Steel.
  + All gaskets installed shall be neoprene per drawing.
  + All welding to conform to the American Welding Society AWS D1.2/D1.4M 2017 Regulations. Use certified welders. Use ER-5356 Electrodes for aluminum and E70 for steel.
  + The engineer or Flood Panel. is not responsible for construction safety at site which is the owner, general contractor, or installer's responsibility. Flood Panel Manufacturer to be responsible for providing the tenant with shop drawings and proper instructions for the installation of these Flood Panels.
  + Surfaces against which the sealing gasket presses must be built "paper-smooth" to prevent excessive water extrusion, beyond that allowed by requirements. All surfaces must be plumb, square, and level.
* **1.02 RELATED WORK**
  + Section 07600 Flashing and Sheet Metal
  + Section 07900 Joint Sealers
* **1.03 REFERENCES**
  + 2021 International Building Code
  + FEMA Technical Bulletin 3-93 Non-Residential Flood proofing
  + FEMA Flood Proofing Non-Residential Structures #102, FEMA P-936
  + FEMA Design Manual for Retrofitting Flood-Prone Residential Structures #114
  + 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 24-14, ASCE/SEI 24-14, ASCE 7-22
  + AWS Structural Welding Code D1.2.D1.4M 2017 Reg.
* **1.04 QUALITY ASSURANCE**
  + Provide a flood barrier and application that is structurally sound, impact resistant and conforming to applicable performance requirements described herein.
  + Except as otherwise indicated, requirements for aluminum flood barriers, terminology, tolerances, standards of performance and workmanship are those specified in NFIP Section 60.3.
  + Base Flood Elevation (BFE) and Building Sub Elevations shall be furnished to Barrier Manufacturer by the Architect or Engineer of Record.
  + All Barrier heights shall be finished to 12” above BFE.
  + Provide Flood Proofing Certification for compliance and approval.
* **1.05 PERFORMANCE REQUIREMENTS**
  + Design Criteria
    - The Assembly shall conform to the requirements for A and AE Zones as set forth by the NFIP.
  + This Flood Log System Flood Panel System (PP) has been designed for the loads and load combinations listed on the ASCE 7-16, Section 2.0 (Combinations of Loads), including the following flood loads according with ASCE 7-16 Section 5.3.3 (Loads During Flooding):
  + 1) Hydrostatic Loads, caused by water which is either stagnant or moves at velocities less than 8 ft/sec, according with ASCE 24-14, Section 6.2.1 and ASCE 7-16, Sections 5.3.3.2 and C5.3.3.2.
  + 2) Impact Loads: Not considered since Hydrostatic analysis is performed for flow of water moving at velocities of less than 8 ft/sec.
  + This Flood Log System Flood Panel System (PP) is designed for a maximum wind load pressure of +/- 180 psf., which is the maximum wind load pressure per Structural Drawings.
* **1.06 EGRESS**
  + Provide a fully removable system including all frame, sill, and jamb assembly members. Permanent sub-frame assemblies shall not be permissible.
* **1.07 SUBMITTALS** 
  + Shop Drawings
    - Submit scaled shop drawings including all conditions of construction, location diagrams including identification of and spacing of anchorage, framing members, joinery, and sealant details.
  + Structural Calculations
    - Provide structural calculations by a licensed structural engineer, P.E State of Florida, demonstrating structural compatibility with project requirements.
* **1.08 WARRANTY**
  + Provide manufacturer’s warranty and warranty qualification stating that flood barriers for above project will be free from defects and workmanship for a period of one (1) year from date of substantial completion.
  + Flood Certificate, signed final inspection by Architect or EOR of installed flood barriers and final installation pictures of each opening is required by Flood Panel to issue a warranty.
* PART 2 PRODUCTS
* **2.01 MATERIALS**
  + Acceptable Flood Barrier Manufacturers
    - Flood Panel
    - 1555 Jupiter Park Drive STE 5
    - Jupiter, FL 33458
    - 860-222-3055
    - Email: [info@floodpanel.com](mailto:info@floodpanel.com); Web: [www.floodpanel.com](http://www.floodpanel.com)
  + Acceptable Flood Barrier Distributors
    - Floodproofing.com
    - 19 Mantua Road
    - Mount Royal, NJ 08061
    - 800-507-0865
    - Email: [info@floodproofing.com](mailto:info@floodproofing.com) Web: [www.floodproofing.com](http://www.floodproofing.com)
  + Architect Approved Equal
    - Products of other manufacturers must be pre-qualified to bid not less than 10 days prior to bid date.
    - Submit proof of compliance inclusive of supporting technical data, engineering calculation, certification of equivalent experience and samples for comparison.
  + Aluminum
    - Extruded aluminum structural frame members, support angles and mullions shall be 6061-T6 alloy and temper and not be less than .125” wall thickness.
    - Aluminum sheet skin shall be 6061-T6 alloy and temper and not less than .125” wall thickness on exterior sheet and not less than .024” on interior sheet.
    - Extruded aluminum brace plates shall be 6061-T6 alloy and temper and not be less than .125” wall thickness.
    - Finishes on all components shall be “Mill Finish”.
  + Gaskets
    - All gaskets shall be a custom sandwich gasket comprised of dense 20 durometer neoprene and rubber composite.
  + Fasteners
    - All anchor bolts to be galvanized steel in conformance with ASTM A-307 or 304 Series Stainless Steel.
  + Sealants
    - Use only sealants that are compatible with all substrates and field applied in accordance with the manufacturer’s recommendations.
* **2.03 FABRICATION**
  + Fabricate flood barriers to comply with requirements indicated for design, dimensions, materials joinery, and performance.
  + Assemble flood barriers at manufacturer’s factory where feasible. Assemble in the largest possible sections according to job site conditions and clearly mark units for reassembly assuring a coordinated installation.
  + Fabricate frames including integral sills to fit in openings of size indicated with allowances made for fabrication and installation tolerances of barriers, adjoining construction, and perimeter rubber gasket joints.
  + Supports, anchorages and accompanying accessories required complete assembly to be supplied by the installing contractor.
* **2.04 REMOVABLE ALUMINUM FLOOD BARRIERS**
  + Removable Flood Barriers and Frames are to be designed to restrain the force of water and debris by means of structural tubular and cladding 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 for an effective seal against site specific and specified flood forces.
  + Attachment anchors to be permanent drop-in threaded type, to accommodate repeatable put up and take down as required for mitigation.
  + Building Contractor shall provide for onsite storage of removable flood barrier system for quick access.
* PART 3 EXECUTION
* **3.01 INSTALLATION**
  + Building contractor shall see to it that all surfaces to receive Flood Barriers shall be “paper smooth”, plumb, true, and level before installation can begin.
  + After verification of field conditions and properly prepared openings, install flood barriers in strict accordance with approved submittal drawings.
* Attach only to smooth surfaces providing for proper and compatible infill for gaps in 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.
* Protect all dissimilar metals with a heavy coat of zinc chromate or bituminous paint.
* Install true and plumb without warping or racking.
* Apply appropriate sealants where indicated on shop drawings and in accordance with manufacturers recommendations.
* Flood shield installer shall install barriers one time, for fitting and anchoring. The installer shall uninstall, and the building contactor shall then move barriers to storage location or as directed by architect or owner’s representative.
* **3.02 CLEANING, INSPECTION AND STORAGE**
  + Inspect all barriers for damaged parts.
  + Repair or replace damaged installed products and components.
  + Touch up all damaged surfaces.
  + Clean all exposed surfaces and let dry before storing.
* **3.03 PROTECTION**
  + The building contractor shall move all barriers to designated storage location and shall stack the barriers in a manner that does not damage the gaskets. Position all gaskets away from high traffic areas in the storage area to prevent damage to the gaskets.
  + Protect installed product and finish surfaces from damage during handling, storage, and installation.
  + Protect all installed product and finished surfaces during normal and general operation.

END OF SECTION

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