FLOOD RISK AMERICA
Proactive Flood Prevention Solutions

FX-90 FIRE-RATED FLOOD DOOR
3-PART SPECIFICATION – BY FLOOD RISK AMERICA
SECTION 08 39 19 – WATERTIGHT DOORS

Note to Specifier: *This specification contains component and configuration options. Where indicated, choose the appropriate choice for your specific project requirements. Bracketed items marked "Testing in progress" reflect Flood Risk America FX-90 fire and flood certification testing underway at the time of this document's issuance and shall be updated with final report numbers prior to use in construction documents.*

PART 1 – GENERAL
1.01 SUMMARY
A. Work Results:
1. Furnish and install permanent, factory-assembled fire-rated flood protection door assemblies capable of functioning as ADA-compliant pedestrian access doors during daily operation and as flood mitigation barriers during flood events while maintaining required fire-rated assembly performance.
2. To maintain ADA compliance for a 32-inch-wide clear opening, provide a minimum 40-inch-wide rough opening, unless otherwise indicated on manufacturer's approved shop drawings.
B. Principal Products:
1. Fire-Rated Flood Door System.
2. Door Hardware.
C. Section Includes:
1. Permanently installed fire-rated flood protection door assemblies, including door frames, leaf, thresholds, seals, hardware, and accessories.
2. Engineering, fabrication, testing, delivery, and installation of fire-rated flood protection door assemblies.
1.02 REFERENCES
A. International Code Council (ICC):
1. International Building Code (IBC), latest edition.
2. International Existing Building Code (IEBC), latest edition.
B. <State> Building Code, latest edition.
C. American Society of Civil Engineers (ASCE):
1. ASCE 24 – Flood Resistant Design and Construction, latest edition.
2. ASCE 7 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures, latest adopted edition.
D. American National Standard for Flood Mitigation Equipment:
1. ANSI/FM 2510, latest edition.
E. Code of Federal Regulations (CFR), Title 44.
F. Federal Emergency Management Agency (FEMA):
1. FEMA/NFIP Technical Bulletin 3 "Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings," latest edition.
2. FEMA P-936 "Floodproofing Non-Residential Buildings."
3. National Flood Insurance Program (NFIP) regulations, latest.
G. Fire Protection Standards:
1. UL 10B.
2. UL 10C.
3. NFPA 252.
4. NFPA 80.
5. CAN/ULC S104.
H. American Society for Testing and Materials (ASTM):
1. ASTM A240/A240M "Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications."
I. Accessibility Standards:
1. 2010 ADA Standards for Accessible Design.
2. ICC A117.1, Accessible and Usable Buildings and Facilities, latest edition adopted by the governing building code or Authority Having Jurisdiction.
3. Applicable state and local accessibility code requirements.

1.03 ADMINISTRATIVE PROCEDURES

A. Coordination Procedures:
1. Coordinate fire-rated flood door locations with existing architectural finishes.
2. Preinstallation Meeting Attendees and Procedures:
a. Conduct meeting [one week] [one month] [other scheduled time], minimum before starting work in this Section.
b. Additional Attendees: <List Attendees>.
c. Additional Agenda Items: <Agenda Items>.

1.04 ACTION SUBMITTALS

A. Product Data:
1. Manufacturer product literature, including hardware information.
2. Installation instructions.
3. Maintenance requirements.
B. Shop Drawings:
1. Dimensioned plans.
2. Sections.
3. Connections.
4. Anchorage details.
5. Hardware locations.
6. Frame configuration.
7. Flood protection height.
8. Fire rating.

Note to Specifier: Paragraph 1.04.C Design Calculations below can be deleted if not required.

C. Design Calculations:
1. Provide calculations, signed and sealed by a qualified professional engineer licensed in the state or territory where the project is located, verifying the door's ability to withstand the design pressure loading, based on building code and specified load combinations.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Statements:
1. For the [manufacturer], [installer], and/or [professional engineer].
B. Delegated Design Submittals:
1. Design for installation system, including anchorage to substrate.
C. Test and Evaluation Reports:
1. ANSI/FM 2510 flood testing documentation. [Testing in progress; documentation to be provided upon completion.]
2. Fire-rating documentation, including listing/report number and applicable test standards UL 10B, UL 10C, NFPA 252, and CAN/ULC S104. [Testing in progress; documentation to be provided upon completion.]
D. Manufacturer's instructions.
E. FEMA Submittals:
1. Dry Floodproofing Certificate for Non-Residential Structures, latest edition.
2. Flood Emergency Operation Plan per FEMA TB 3, latest edition.
3. Inspection and Maintenance Plan per FEMA TB 3, latest edition.
4. Post-flood inspection procedures.
5. Annual inspection service documentation, as required by the AHJ or project documents.
6. Early warning system documentation, as required by the AHJ or project documents.
7. Flood Insurance (when required):
a. Documentation that design factored in estimated flood insurance costs for the building per FEMA TB 3, latest edition.
b. Dry Floodproofing Credit for NFIP Flood Insurance: The above documents should be submitted to apply for a Dry Floodproofing Credit (only available for non-residential buildings). Contact an insurance agent for assistance in submitting and for more information.

1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Manual.
B. Approved shop drawings.
C. Product data.
D. Warranty documentation.
E. Fire-rating certification documentation.
F. Flood testing documentation.
G. Installation documentation.
H. Training documentation.
I. Inspection and maintenance program.
J. Emergency operation procedures, where specified.

1.07 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer: Flood Risk America, with ten (10) years of documented industry experience in flood protection products and systems.
Note to Specifier: Paragraphs 1.07.A.2 and 1.07.A.3 below can be deleted if not required.
2. Installer: Three (3) years of experience, minimum, in the installation of the products specified in this Section.
a. Contractor/installer shall complete manufacturer's post-installation checklist and provide a copy to owner and manufacturer upon completion.
3. Licensed Professional Engineer: A professional engineer specialized in the work specified in this Section and licensed in the State or Territory in which the project is located.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Inspection:
1. Deliver products in manufacturer's unopened packaging with labels undamaged, legible, and readable until ready for installation.
2. Inspect materials for damages.
B. Storage:
1. Protect stored materials from moisture exposure.
2. Store materials in a dry, cool, ventilated, and weathertight location.

1.09 FIELD CONDITIONS

A. Ambient Conditions:
1. Perform work within manufacturer's recommended weather and temperature limitations.
B. Existing Conditions:
1. Verify field measurements before fabrication.
2. Show field measurements on Shop Drawings.
3. Have flood door manufacturer, installer, or qualified person(s) conduct site survey to document the conditions at the installation site to detail the type of materials, dimensions, configuration, potential interferences with the mounting surface, and any other contributing factors for proper installation.

1.10 WARRANTY

A. Manufacturer Warranty:
1. Warrant product to be free from defects in material and workmanship for a period of one (1) year from date of shipment.
2. Contact manufacturer regarding extended warranty options.

1.11 ENVIRONMENT OF USE

A. Door assembly shall be suitable for the exposure conditions indicated.
B. Material selection, finish, and hardware shall be coordinated with project-specific environmental conditions, including exterior exposure, humidity, saltwater, wash-down conditions, chemical exposure, wind, seismic, snow, ice, and corrosive environments.
C. Suitability for corrosive, saltwater, chemical, or high-moisture environments shall be confirmed with manufacturer prior to fabrication.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Approved Manufacturer:
1. Flood Risk America
720 Lucerne Ave, Suite 567
Lake Worth, FL 33460
Phone: (561) 644-3311
Email: info@floodriskamerica.com
Website: floodriskamerica.com
B. Basis of Design Product:
1. Flood Risk America FX-90 Fire-Rated Flood Door by Flood Risk America.
C. Substitutions:
1. Not permitted.
D. Single Source Responsibilities:
1. Obtain all flood door assemblies from single manufacturer.

2.02 FLOOD PROTECTION DOOR ASSEMBLY

A. General Description:
1. Provide a permanently installed flood protection door assembly capable of functioning as a standard pedestrian access door during normal operation and as a flood mitigation barrier when closed and latched.
2. Door assembly shall be specifically engineered and fabricated for each project opening.
3. Assembly shall provide both flood protection and fire resistance performance where indicated.
4. Flood protection shall be achieved through the permanently installed door leaf, frame, threshold, seals, 3-point pressure locking system, and hardware protection box where required based on Flood Protection Height and hardware elevation.
5. Field trimming, drilling, welding, cutting, hardware substitutions, or other modifications shall not be permitted unless specifically authorized in writing by Flood Risk America and allowed by the applicable fire listing.
B. Classifications:
1. Permanent Active Flood Barrier.
2. Pedestrian Swing Door Assembly.
3. Fire-Rated Flood Protection Door Assembly.
4. ADA-Compliant Pedestrian Swing Door Assembly.

2.03 PERFORMANCE REQUIREMENTS

A. Engineering Code Practices:
1. Engineer flood protection products to conform to the design requirements that are based on the latest adopted editions of ASCE 24, ASCE 7, and the International Building Code (IBC).
B. Design Criteria:
1. Conform to the requirements for A and AE Zones as set forth by the National Flood Insurance Program (NFIP).
a. Design flood door to support, either individually or in combination, temporary superimposed live loads as specified in the latest editions of ASCE 24 and ASCE 7.
b. Ensure all types of flood-related loads from the flood protection doors are transferred either through anchorage to structural floor slabs and/or jamb anchorage, and directly via pressure contact with structural walls or other structural elements.
c. Per ASCE 24, the flood protection door assembly and all necessary accessories shall be tested and documented to meet the applicable requirements of the American National Standard for Flood Mitigation Equipment, ANSI/FM 2510.
C. General Performance:
1. Door assembly shall function as a normal pedestrian access door under normal conditions, including a full 120-degree door swing for standard, everyday usability.
2. Door assembly shall provide fire and flood protection when fully closed and engaged via the 3-point pressure locking system. Where Flood Protection Height exceeds hardware elevation, provide manufacturer's removable hardware protection box; hardware protection box shall not function as a secondary latch.
3. Door shall remain continuously installed within the opening.
D. Flood Performance:
1. Door assembly shall be tested in accordance with ANSI/FM 2510 Section 4.3 for flood barriers for opening barrier applications. [Testing in progress; documentation to be provided upon completion.]
2. Door assembly shall demonstrate compliance with ANSI/FM 2510 hydrostatic loading, leakage, and debris impact requirements.
3. Design configuration shall withstand an 8-foot hydrostatic head.
4. Leakage shall not exceed the ANSI/FM 2510 allowable leakage rate of 0.08 gallons per hour per linear foot of gasket seal.

5. Configuration shall be tested for compliance with ANSI/FM 2510 debris impact requirements. [Test results to be documented upon completion of ANSI/FM 2510 testing.]
6. Leakage and impact performance shall be documented through manufacturer's ANSI/FM 2510 test documentation upon completion.
E. Fire Performance:
1. Fire-Rated Door/Frame Assembly. [Listing agency and report/spec ID to be issued upon completion of fire testing.]
2. Positive Pressure Fire Rating:
a. 90 minutes.
3. To be tested and qualified in accordance with:
a. UL 10B.
b. UL 10C.
c. NFPA 252.
d. CAN/ULC S104.
4. Fire-rated assemblies shall bear a permanent third-party certification label upon completion of listing. Labels shall remain visible and legible and shall not be removed, painted over, modified, or obscured.
F. Accessibility:
1. ADA-compliant threshold.
2. ADA-compliant hardware.
3. ADA-compliant clear opening dimensions.

2.04 DESIGN REQUIREMENTS

A. Flood Protection Height
1. Flood Protection Height (FPH) shall be as indicated on Contract Documents.
2. Flood Protection Height shall be measured from finished floor elevation unless noted otherwise.
3. Door assembly shall be designed to resist hydrostatic loads associated with the specified Flood Protection Height, up to a maximum tested height of 8 feet.
B. Structural Design
1. Flood service loads shall be transferred into the adjacent structure through the frame, anchors, and supporting substrate.
2. Verification of building capacity to resist imposed flood loads shall be by others.
3. Design of supporting structure and load path shall be by others.
C. Door Orientation
1. Door shall be installed with the leaf swinging toward the wet side of the opening.
2. Right-Hand Reverse or Left-Hand Reverse orientation.
3. Right-Hand Inward Swing or Left-Hand Inward Swing is not permitted.
4. Door leaf shall open to a full 120 degrees, subject to clearances indicated on approved shop drawings.

2.05 FIRE-RATED CONFIGURATION REQUIREMENTS

A. Fire-Rated Door Leaf
1. Maximum certified door leaf size:
a. Width: 46 inches.
b. Height: 94 inches.
c. Thickness: 1-3/4 inches minimum.
2. Single leaf and double leaf configurations available, subject to project-specific engineering and applicable fire listing requirements.
3. Vision panels shall not be permitted on fire-rated configurations.
B. Fire-Rated Hardware
1. Hardware shall be listed and labeled for use on fire-rated assemblies.
2. Fire-rated panic hardware shall be provided where indicated.
3. Hardware substitutions shall not be permitted unless reviewed and approved in writing by Flood Risk America and permitted by the applicable fire listing, fire-rating agency requirements, and Authority Having Jurisdiction.

2.06 DOOR LEAF CONSTRUCTION

A. Construction
1. Fabricate door leaf from stainless steel construction.
2. Utilize hemmed and stepped edge construction.
3. Gasket system shall be recessed within the leaf profile to minimize damage and environmental exposure.
4. Door leaf shall utilize reinforced welded construction.
B. Bottom Corner Reinforcement
1. Provide reinforced lower corner construction to improve sealing performance at critical locations.
C. Finish
1. Standard stainless steel finish.
2. Coating options available.

3. Field painting shall not be performed where it would obscure labels, interfere with gasketing, affect hardware operation, or violate applicable fire listing requirements.

2.07 FRAME CONSTRUCTION

A. General

1. Fabricate frame from stainless steel construction.
2. Frame shall be engineered to transfer flood service loads to adjacent structure.
3. Frame shall be capable of accepting grout fill where required.
4. The FX-90 Fire-Rated Flood Door assembly is available in flange and flangeless frame configurations.

a. A flange frame includes a perimeter flange that extends outward from the frame, allowing the door to be installed in a range of rough openings. If required by flood load engineering, it is fastened to the face of the surrounding wall, in addition to the door frame, providing a larger attachment area to distribute loads to the substrate.

b. A flangeless frame does not include a perimeter flange and is designed to be installed within a prepared wall opening, with anchors installed through the frame into the surrounding structure. This configuration is custom made to fit within the rough opening and allows the door frame to sit more flush with the wall surface and is typically used where a recessed or integrated appearance is desired.

B. Flange Frame Configuration

1. Manufacturer's proprietary flange frame system.
2. May be utilized where larger rough openings must accommodate listed fire-rated leaf dimensions.
3. Flange shall provide supplemental attachment area and load distribution.
4. Flange frame configuration shall permit installation in rough openings from 52 inches wide by 98 inches high up to 57 inches wide by 100-1/2 inches high, while maintaining the listed fire-rated door leaf dimensions, subject to approved shop drawings, project-specific engineering, substrate conditions, and applicable fire listing requirements.

C. Flangeless Frame Configuration

1. Provide flush or inset appearance within prepared opening.
2. Install anchors through frame into supporting structure.
3. Fabricate frame to project-specific dimensions.
4. Flangeless configuration may work best for wall conditions with an applied finish such as brick or stone, allowing the frame to be set back and properly anchored to the structure with proper edge distances.

D. Wall Conditions

1. Anchorage type, spacing, embedment, edge distance, and substrate requirements shall be as indicated on approved shop drawings and project-specific engineering and shall comply with tested/listed assembly requirements.
2. Coordinate wall-condition-specific anchor schedules with Flood Risk America engineering prior to fabrication.

2.08 THRESHOLD

A. Provide ADA-compliant threshold.
B. Fabricate stepped sill threshold from stainless steel construction.
C. Threshold shall provide a positive sealing surface for flood gasketing.
D. Threshold shall be compatible with flood loading requirements and door operation.

2.09 LOCKING SYSTEM

A. Provide manufacturer's 3-point pressure locking system, engaging the door leaf to the frame at three points to distribute sealing pressure uniformly around the perimeter gasket.
B. Locking system shall provide the primary means of achieving and maintaining flood-tight seal; no secondary flood latching devices shall be required.
C. Locking system shall be operable as part of normal, everyday door hardware operation.

2.10 GASKETS AND SEALS

A. Provide continuous perimeter flood gasket system.
B. Gaskets shall be EPDM or manufacturer's standard material tested with the assembly.
C. Gaskets shall provide continuous sealing around the door perimeter.
D. Corner transitions shall be mitered and sealed.
E. Replaceable gasket construction shall be provided.

2.11 HARDWARE

A. General

1. Provide manufacturer's standard listed and labeled fire-rated hardware compatible with the tested and listed fire-rated flood door assembly.
2. Hardware shall be corrosion resistant.

B. Panic Hardware

1. Fire-rated panic device, where indicated.
2. Positive latching operation.
3. ADA-compliant operation.

C. Hinges

1. Manufacturer's standard fire-rated, corrosion-resistant continuous or butt hinges.

D. Locksets
1. Fire-rated lockset.
2. Positive latching configuration, integrated with 3-point pressure locking system.
E. Closers
1. Provide listed self-closing device where required by the fire-rated assembly listing, applicable code, or Authority Having Jurisdiction.
2. Adjustable closing speed.
3. Fire-rated compatible construction.

2.12 ACCESSORIES

A. Hardware Protection Box
1. Gasketed cover box to protect door handle hardware.
2. Intended for flood conditions where water elevation may exceed hardware elevation.
3. Fabricated stainless steel construction.
4. Removable and reusable.
B. Header Drip Edge
1. Optional rain deflection component.
2. Manufacturer's standard construction.
C. Electrified Hardware
1. Available where indicated.
2. Shall comply with fire listing requirements.
D. Kick Plates
1. Stainless steel.
2. Standard and custom heights available.

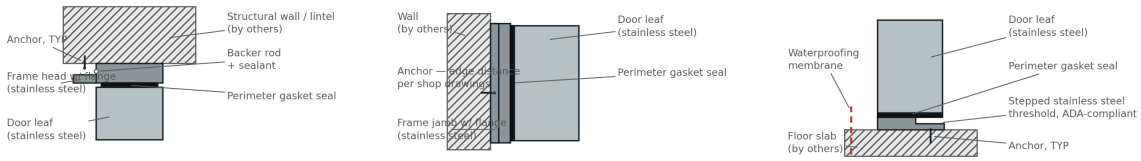
2.13 FABRICATION

A. Fabricate assemblies to dimensions indicated on approved shop drawings.
B. Fabricate components to permit installation within specified tolerances.
C. Weld exposed joints smooth.
D. Fabricate assemblies in accordance with tested and listed configurations.
E. Fabricate assemblies under manufacturer's quality control procedures.
F. Fire-rated assemblies shall be manufactured under active third-party certification program requirements upon completion of listing.

2.14 TYPICAL INSTALLATION DETAILS

A. Head, jamb, and sill details below are schematic and provided for general coordination only.
B. Final dimensions, anchorage type/spacing/embedment, wall-condition requirements, and flood/fire listing details shall be per approved shop drawings and Flood Risk America project-specific engineering.

FX-90 FIRE-RATED FLOOD DOOR — TYPICAL INSTALLATION DETAILS



HEAD DETAIL **JAMB DETAIL** **SILL DETAIL**

SCHEMATIC — NOT TO SCALE — FOR COORDINATION ONLY. Final dimensions, anchorage, and wall-condition requirements per approved shop drawings and Flood Risk America project-specific engineering.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates, rough openings, and supporting construction prior to installation.
B. Verify:
1. Rough opening dimensions.
2. Opening plumbness.
3. Opening squareness.
4. Structural adequacy of supporting construction.
5. Flood protection height requirements.
6. Anchorage conditions.
7. Conflicts with adjacent construction.
C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Existing slabs, walls, and columns adjacent to openings where fire-rated flood door is to be installed shall be structurally adequate for flood loading requirements and waterproofed with a waterproof membrane or waterproof sealer surface treatment prior to installation.
B. Prepare opening in accordance with approved shop drawings.
C. Remove debris, loose materials, and obstructions.
D. Verify opening dimensions prior to placement of assembly.
E. Coordinate installation with adjacent trades.
F. Verify required clearances are available for installation and operation.

3.03 INSTALLATION

A. General: Installation shall be performed by manufacturer, manufacturer-approved installer, or qualified installer in accordance with manufacturer's written instructions, approved shop drawings, and applicable tested/listed assembly requirements.
1. Install fire-rated flood protection door assembly in accordance with:
a. Manufacturer's written instructions.
b. Approved shop drawings.
c. Applicable code requirements.
d. Tested and listed assembly requirements.
2. Install components level, plumb, square, and true.
3. Protect components from damage during installation.
B. Frame Installation
1. Secure frame to supporting structure using manufacturer-approved anchors.
2. Maintain required edge distances and anchor spacing.
3. Shim as required to maintain alignment.
4. Grout frame where indicated on approved shop drawings.
5. Maintain clearances required by tested assembly.
C. Sealants
1. Install backer rod and sealant at perimeter joints where indicated.
2. Provide continuous weather-tight seal between frame and adjacent construction.
3. Install sealants on the sill where indicated.
4. Install sealants in accordance with Division 07 requirements.
D. Door Installation
1. The door leaf will come pre-installed within frame.
2. Install the door assembly in accordance with manufacturer's instructions.
3. Verify smooth operation throughout full range of motion, up to 120 degrees.
4. Verify proper engagement of seals and hardware.
5. Verify positive latching operation of the 3-point pressure locking system.
E. Hardware Installation
1. Install hardware and fire-rated hardware in accordance with manufacturer's instructions and listing requirements.
2. Verify proper operation of all hardware components.
3. Adjust hardware for smooth operation, including strike plate.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Services
1. Manufacturer may provide field support services when specified.
2. Manufacturer may review installation for general conformance with approved shop drawings.
B. Field Verification
1. Verify assembly is properly installed.
2. Verify door operates freely without binding.

3. Verify positive latching operation.
4. Verify gasket contact around entire perimeter.
5. Verify threshold condition.
6. Verify frame anchorage is complete.
7. Verify required labels remain visible.
C. Correct deficiencies identified during inspection.

3.05 ADJUSTING

A. Adjust door leaf to achieve proper operation.
B. Adjust hardware for proper function.
C. Adjust closers for proper closing speed and latching.
D. Replace damaged components.
E. Replace damaged gaskets.

3.06 CLEANING

A. Remove protective coverings.
B. Remove construction debris.
C. Clean exposed surfaces.
D. Clean hardware and thresholds.
E. Do not use cleaning materials that may damage finishes, seals, or gaskets.

3.07 DEMONSTRATION AND TRAINING

A. Provide owner training following installation.
B. Training shall include:
1. Normal door operation.
2. Flood event procedures.
3. Hardware operation.
4. Inspection requirements.
5. Maintenance requirements.
6. Post-flood inspection procedures.
7. Emergency response procedures.
C. Demonstrate:
1. Opening and closing procedures.
2. Positive latching operation.
3. Flood readiness verification.
4. Inspection procedures.
D. Provide attendance documentation when requested.

3.08 INSPECTION AND MAINTENANCE PROGRAM

A. Provide written Inspection and Maintenance Program.
B. Program shall include:
1. Inspection intervals.
2. Gasket inspection procedures.
3. Hardware inspection procedures.
4. Threshold inspection procedures.
5. Frame inspection procedures.
6. Corrective action recommendations.
C. Recommend inspection:
1. At least annually.
2. Following flood events.
3. Following impact or damage.
4. Following major building renovations affecting the opening.
D. Replacement components shall be manufacturer approved.

3.09 FLOOD EMERGENCY PREPAREDNESS

A. Provide written Flood Event Checklist.
B. Checklist shall include:
1. Verification of door operability.
2. Verification of latching mechanisms.
3. Verification of gasket condition.
4. Verification of threshold condition.
5. Inspection of adjacent wall conditions.
6. Verification of flood protection readiness.
C. Where specified, integrate flood protection door assembly into building Emergency Operation Plan (EOP).
D. Where specified, integrate flood protection door assembly into early warning system procedures.

3.10 POST-FLOOD INSPECTION

A. Following flood events, inspect:
1. Door leaf.
2. Frame.
3. Threshold.
4. Hardware.
5. Anchors.
6. Gaskets and seals.

B. Document observed damage.
C. Clean and remove any dirt, debris, and/or salt from all parts and components.
D. Repair or replace damaged components prior to returning assembly to service.
E. Verify proper operation following completion of repairs.

END OF SECTION