



PS Flood Barriers™  
*Solutions That Hold Water*

# OPERATIONS & MAINTENANCE MANUAL

## LIFT-OUT FLOOD BARRIER MODEL: LO-510



### To Contact PS DOORS:

**By Mail:** PS DOORS  
Attn: PS Flood Barriers  
1150 S. 48th Street  
Grand Forks, ND 58201

**Website:** [psdoors.com](http://psdoors.com)

**By Phone:** Phone 1-701-746-4519  
Toll Free 1-877-446-1519

**By Email:** [4psinfo@psdoors.com](mailto:4psinfo@psdoors.com)

**Hours of Operation:** 8:00 am to 5:00 pm (Central Standard Time); Monday thru Friday

Drawing No.: \_\_\_\_\_

**Manufactured By:**  
**PS DOORS**  
1150 S. 48th Street  
Grand Forks, ND 58201  
[www.psdoors.com](http://www.psdoors.com)

## If you need to contact Customer Service

Please complete the following information and retain for future reference:

Serial Number: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

PS DOORS Job Number: \_\_\_\_\_

Contractor: \_\_\_\_\_

Project Name: \_\_\_\_\_

## For Customer Service

**By Mail:** PS DOORS  
Attn: PS Flood Barriers  
1150 S. 48th Street  
Grand Forks, ND 58201

**Website:** [psdoors.com](http://psdoors.com)

**By Phone:** Phone 1-701-746-4519  
Toll Free 1-800-284-0623

**By Email:** [4psinfo@psdoors.com](mailto:4psinfo@psdoors.com)

**Hours of Operation:** 8:00 am to 5:00 pm (Central Standard Time); Monday thru Friday

### Complication and Publication Notice

This manual has been compiled and published covering the latest product descriptions and specifications.

The contents of this manual and the specifications of this product are subject to change without notice.

PS DOORS reserves the right to make changes without notice in the specifications and materials contained herein and shall not be responsible for any damages (including consequential) caused by reliance on the materials presented, including but not limited to typographical and other errors relating to the publication.

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# LIMITED WARRANTY

PS DOORS warrants this product and components to be free from defects in material and workmanship for a period of one (1) year from date of shipment. If within the term of this warranty, if any Lift-Out Flood Barrier or component is found to be defective upon inspection by an authorized PS DOORS representative, PS DOORS will replace or repair, at PS DOORS' discretion, any part found to be defective. Any field labor charges incurred are the sole responsibility of the customer.

To make a claim under this warranty, contact PS DOORS at the address shown below.

PS DOORS  
Attention: Warranty  
1150 S. 48th Street  
Grand Forks, ND 58201

Toll Free: 800-284-0623  
Phone: 701-746-4519  
Fax: 701-746-8340  
E-mail: 4psinfo@psdoors.com

Unauthorized modification of or to this product voids the PS DOORS Limited Warranty. Accordingly, you can expect any request for warranty repair to be charged to you, if the product requires service after unauthorized modification. Authorized modifications, received in writing from PS DOORS, as long as the modification is accomplished in strict accordance with PS DOORS' instructions, does not void warranty. To request product modifications contact PS DOORS, 1150 S. 48<sup>th</sup> Street, Grand Forks, ND 58201, phone 800-284-0623, email: 4psinfo@psdoors.com.

PS DOORS SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES.

All other warranty's, express or implied including any warranty of merchantability, are expressly excluded. Some states do not allow the exclusion or limitation of consequential or incidental damages, so the above limitation or exclusion may not apply to you.

WARRANTY DOES NOT APPLY TO ANY DAMAGE OR DETERIORATION CAUSED BY MODIFICATION, ABUSE, APPLIED PAINT FAILURE OR FAILURE TO PROVIDE REASONABLE AND NECESSARY MAINTENANCE.

This warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state.

#### Exclusions:

Seals and/or Gasketing are considered a "wear-item" and are not covered under this warranty.



## **IMPORTANT!** ACTION REQUIRED!

In order to Validate your Warranty the following information must be completed and returned to PS DOORS, failure to completely fill out this information, or to return information to PS DOORS may void warranty.

### WARRANTY REGISTRATION

Owner Name: \_\_\_\_\_ Product: \_\_\_\_\_  
Company: \_\_\_\_\_ Model: \_\_\_\_\_  
Address: \_\_\_\_\_ Serial Number(s): \_\_\_\_\_  
City: \_\_\_\_\_ Date Installed: \_\_\_\_\_  
State/Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_  
Country: \_\_\_\_\_

Please answer the following questions:

1. Has the installed product been tested?  Yes  No
2. Test Witnessed by, Name: \_\_\_\_\_ Date: \_\_\_\_\_
3. Product Initial Inspection by, Name: \_\_\_\_\_ Date: \_\_\_\_\_

Warranty Registration must be returned to:

- Fax: 701-746-8340
- Email: 4psinfo@psdoors.com
- Mail: PS DOORS  
1150 S. 48th Street  
Grand Forks, ND 58201

Warranty Registration Information will be used for activation of product warranty only.

# Safety precautions

We use the following icons throughout the Operations & Maintenance Manual.

**DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderated injury.

**NOTICE** Indicates manufacture's statement of additional information.

**IMPORTANT!** Indicates a required action.

**CRITICAL** Indicates a vital component to product performance.

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## LIFT-OUT FLOOD BARRIER; Model LO-510

The LO-510 is a specially designed Lift-out Flood Barrier capable of providing flood protection. The LO-510 is specifically manufactured to meet the opening dimensions and Water Protective Height (WPH) of each customer's specific site requirements. **DUE TO THE CUSTOM NATURE OF EACH LO-510 FLOOD BARRIER, THEY DO NOT ALL LOOK THE SAME, NOR LATCH OR OPERATE EXACTLY THE SAME. REFER TO INSTALLATION AND CONSTRUCTION DRAWINGS FOR YOUR SPECIFIC INSTALLATION AND OPERATION.**

Please keep these instructions for later reference and read them before attempting any maintenance or operation of the product.

## **NOTICE** ADDITIONAL INFORMATION

1. No additional allowances have been included for hydrodynamic loads, debris impact loads or wave loads, unless specifically detailed in additional documentation provided.
2. All water pressure loads, impact loads, and operating loads are transferred to the building structure. Building structure design, capacity to accept loads from flood barriers, and evaluation of loads to structure is by others.
3. PS DOORS recommends that the owner implement a regular maintenance program to inspect the gaskets and barrier panels. This program may require the replacement of gaskets; touch up painting and accounting for of all the latching devices.
4. If the water height exceeds the level of any door penetrations or water protective design height, leakage will occur.
5. This product is equipped with compressible seals, which are not dependant on inflation devices.
6. PS DOORS recommends a flood preparedness plan be developed, trained on, and implemented to be activated during times of potential flooding conditions.
7. PS DOORS AND/OR ITS RESPECTIVE SUPPLIERS MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) OR SERVICE(S) OFFERED AND/OR THE PROGRAM(S) AT ANY TIME WITHOUT NOTICE.

**IMPORTANT!**

**Read entire Operations & Maintenance Manual to become familiar with the product.**

**NOTICE**

This product is a flood protective barrier. The effectiveness of the product is directly related to the proper installation and maintenance of this product. Failure to properly maintain this product **will** affect performance.

# Product Description

The PS DOORS Lift-Out Barrier, Model LO-510 is to be constructed in accordance with PS DOORS' standard design, specification, and fabrication methods for Custom Flood Barriers.

***The following components, in accordance with description provided, are included:***

1. **Flood Barrier Panel:** To be fabricated as a welded structural frame, and sheeted one or both sides with flat sheeting welded in place. Flood door panel to be designed for maximum water height requested above Finished Floor Elevation (FFE). All loads transferred to adjacent structure. This design is subject to a uniformly increasing fluid pressure (hydrostatic pressure loading of water at 62.5 pcf) with a 2:1 design safety factor based on material yield strengths.
2. **Flood Barrier Frame:** To be of PS DOORS' design, for field installation on existing structure and/or embedded within structure. Frame members to be fabricated from structural shapes and formed members. Field grouting is/ may be required.
3. **Gaskets:** To be factory mounted to the flood barrier or frame. Gaskets to be compressible rubber type, field replaceable.
4. **Flood Barrier Panel and Frame Finish:** Finish on all exposed surfaces to be one of the following:
  - A. (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).
  - B. Aluminum or Stainless Steel, Mill Finish, welds ground not polished.
5. **Latching Hardware:** To be spin-down knob type. Appropriate number of latches for the size, type, and design.
6. **Installation Hardware:** PS DOORS includes all sealants, water-stop, anchors, and hardware necessary for installation, latching and retaining flood doors as designed. Note: Anchors are engineered for load design and shall not be changed without factory authorization.
7. **Labeling:** Each flood door and frame will be individually identified for matched installation. Factory provides Warning Placards.
8. **Warranty:** PS DOORS warrants this product and components to be free from manufacturing defects for a period of one (1) year from date of shipment. See warranty document on page 3 of this document.

***The following information is available upon request:***

- Structural Calculations: A copy of PS DOORS' design calculations by a qualified engineer, to verify the flood barrier's ability to withstand the design loading, is available upon request.

***The following optional services are available upon request:***

- Optional: Registered professional engineer stamped calculations from within the state or territory where the building will be constructed or substantially improved are available at additional cost.

PS DOORS AND/OR ITS RESPECTIVE SUPPLIERS MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) OR SERVICE(S) OFFERED AND/OR THE PROGRAM(S) AT ANY TIME WITHOUT NOTICE.

**IMPORTANT!** Read entire Operations and Maintenance Manual to become familiar with the product.

**NOTICE** This product is a flood protective barrier. The effectiveness of the product is directly related to the proper installation and maintenance of this product. Failure to properly maintain this product **will** affect performance.

## 1. GENERAL INFORMATION

This manual contains information regarding operation and maintenance of custom water resistant flood barrier assemblies.

This product is manufactured to specific guidelines. Unauthorized alteration in any way will result in voiding Factory Warranty, and may cause product to fail.

## 2. OPERATION GUIDELINES

The following procedures and information are supplied for the operation of the LO-510 Lift-out Flood Barrier assemblies. Operation in a manner other than intended could result in damage or less than acceptable performance at time of need, for which the manufacturer will not be held responsible.

Always plan for potential leakage and condensation that can occur during flooding conditions.

## 3. SAFETY PRECAUTIONS

- Ensure opening is clear of all obstructions or debris during operation.
- Do not force panels or components if they do not operate freely.
- If removing panels or hardware for maintenance, consult documents for panel weights, and use appropriate hoisting equipment. Protect all gaskets and hardware. Always consult original factory drawings for all installation dimensions, details, hardware, and specifications.

## 4. OPERATION UNDER FLOODING CONDITIONS

- **Pre-flooding or Potential Flooding Conditions:**
  - At a minimum, conduct Inspection and Maintenance activities as described in this Operations & Maintenance Manual.
  - Ensure LO-510 Lift-out Flood Barrier is located near the required area for placement when needed, and is placed prior to flood waters reaching the opening.
- **Flooding Conditions Present:**
  - Ensure LO-510 Lift-out Flood Barrier is not opened at any time when flooding conditions are present.
  - If feasible, check LO-510 Lift-Out Flood Barrier for leakage or condensation accumulation.

### **TO SET BARRIER IN PLACE:**

- A. Inspect gaskets, repair or replace as needed.
- B. Clean sill, embedded channels, and jambs of any debris.
- C. Using lift points at top of barrier, hoist and locate barrier panel into position, holding gaskets against jambs, and lower panel completely to ground.
- D. Insure barrier panel is centered in opening and bottom gasket is in proper position and compressed by the weight of the barrier panel.

**NOTICE** Unauthorized modification of this product voids the PS DOORS Limited Product Warranty. Accordingly, you can expect any request for warranty repair to be charged to you, if it requires service after modification. Authorized modifications, received in writing from PS DOORS, as long as the modification is accomplished strictly in accordance with PS DOORS' instructions, does not void warranty. To request product modifications contact PS DOORS.

**WARNING** The flood protective barrier panel MAY BE heavy, verify panel weights and use appropriate lifting procedures and equipment.

**CAUTION** When placing barrier keep clear of pinch points at the latching mechanism at all times.



- E. Position jamb retainer clamps on threaded compression rods, and tighten to compress jamb gaskets.
- F. Visually inspect all gaskets for proper positioning and compression. If not in good position and compression, unlatch barrier panel and adjust accordingly.

- **Post-flooding Conditions:**

- At a minimum, conduct Inspection and Maintenance activities as described in the Operations & Maintenance Manual.

## 5. INSPECTION AND MAINTENANCE

- **Sills, Frames, and Embedded items:**

- Inspect items for damage and misalignment. Adjust, repair, or replace as needed, to meet original design tolerances.
- Check all embedded connections, making sure they meet original design standards (*refer to original product drawings*).

- **Fasteners and mechanical connections:**

- All fasteners must be in place and adjusted to their original design standards. Replace any damaged components (*refer to original product drawings*).

- **Sealants and Water-stops:**

- Inspect all sealants used on frames and connections to insure their effectiveness. Replace any cracked, loose, or otherwise non-performing sealants.
- Use only factory approved/supplied products.

- **Gasketing:** Check all gaskets around perimeter of opening.

- Inspect for gasket and corner splice damage, and for continuous adhesion to the attached surface.
- Visually inspect all gaskets for proper positioning and compression.
- Replace or repair if damage or deterioration to gaskets has occurred.
- Use only factory approved materials (*refer to installation drawings/information*).

- **Latching:**

- Operate all latching hardware to ensure smooth, uninhibited movement of all mechanical components.
- Place flood barrier and check latches for proper engagement. If gaskets are not properly positioned and properly compressed, unlatch barrier panel and adjust latching accordingly.

- **Finishes:**

- Inspect and clean finishes periodically.
- Touch-up repair finishes, or refinish as necessary to protect the structural integrity of the product.

- **Labels and Placards:**

- Inspect all labels and placards. Replace any labels and placards which are unreadable.

- **Housekeeping:**

- Clean sill and jambs of any debris and keep the area clean throughout barrier opening.

**NOTICE** PS DOORS recommends all facilities subject to flooding conditions, and employ any type of flood protection have a **Flood Preparedness Plan** in place for activation prior to, or in times of flooding conditions.

**IMPORTANT!** Consult drawings before replacing fasteners, as most have specific design load requirements.

**CRITICAL** Gaskets are a critical component of the flood protective barrier performance and must meet minimum compression tolerances in the latched position.

**WARNING** THIS IS A FLOOD PROTECTION BARRIER. NEVER OPEN DURING ANY FLOODING CONDITIONS AS WATER LEAKAGE WILL OCCUR AND YOU MAY NOT BE ABLE TO RECLOSE THE BARRIER.

