DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

122072

OMB No.: 1660-0008
Expiration: 11/30/2022

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

The floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation; however, a floodproofing design certification is required. This form is to be used for that certification. Floodproofing of a residential building does not alter a community's floodplain management elevation requirements or affect the insurance rating unless the community has been issued an exception by FEMA to allow floodproofed residential basements. The permitting of a floodproofed residential basement requires a separate certification specifying that the design complies with the local floodplain management ordinance.

BUILDING OWNER'S NAME

Kingston Resort Owner, LLC

STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. Number) OR P.O. ROUTE AND BOX NUMBER

9750 Queensway Boulevard (Pump Building)

OTHER DESCRIPTION (Lot and Block Numbers, etc.)

Horry County PIN# 393-00-00-0670

CITY	STATE	Zip Code
Myrtle Beach	SC	29572

FOR INSURANCE COMPANY USE

POLICY NUMBER

COMPANY NAIC NUMBER

SECTION I – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Provide the following from the proper FIRM:

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM INDEX	FIRM ZONE	BASE FLOOD ELEVATION (in AO Zones, Use Depth)
450104	45051C0594	K	12-16-2022	AE	11

Indicate elevation datum used for Base Flood Elevation shown above: ☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: _____

SECTION II – FLOODPROOFED ELEVATION CERTIFICATION (By a Registered Professional Land Surveyor, Engineer, or Architect)

All elevations must be based on finished construction.

Floodproofing Elevation Information:

Building is floodproofed to an elevation of 16 . 4 feet (In Puerto Rico only: _____ . _____ meters).

☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: _____

(Elevation datum used must be the same as that used for the Base Flood Elevation.)

Height of floodproofing on the building above the lowest adjacent grade is 4.8 feet (In Puerto Rico only: _____ meters).

For Unnumbered A Zones Only:

Highest adjacent (finished) grade next to the building (HAG) _____ . _____ feet (In Puerto Rico only: _____ . _____ meters).

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____

(NOTE: For insurance rating purposes, the building's floodproofed design elevation must be at least 1 foot above the Base Flood Elevation to receive rating credit. If the building is floodproofed only to the Base Flood Elevation, then the building's insurance rating will result in a higher premium. See the Instructions section for information on documentation that must accompany this certificate if being submitted for flood insurance rating purposes.)

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

Non-Residential Floodproofed Elevation Information Certification:

Section II certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information

I certify that the information in Section II on this Certificate represents a true and accurate interpretation and determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME	LICENSE NUMBER (or Affix Seal)		
Michael A Giovannozzi, PE	SC PE # 30306		
TITLE	COMPANY NAME		
Engineer	Michael A Giovannozzi, PE		
ADDRESS	CITY	STATE	ZIP CODE
534 28th St	West Palm Beach	FL	33407
SIGNATURE	DATE	PHONE	
	8/22/22	561-703-5230	

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30306 MICHAEL A GIOVANNOZZI

SECTION III – FLOODPROOFED CERTIFICATION (By a Registered Professional Engineer or Architect)

Non-Residential Floodproofed Construction Certification:

I certify the structure, based upon development and/or review of the design, specifications, as-built drawings for construction and physical inspection, has been designed and constructed in accordance with the accepted standards of practice (ASCE 24-05, ASCE 24-14 or their equivalent) and any alterations also meet those standards and the following provisions.

The structure, together with attendant utilities and sanitary facilities is watertight to the floodproofed design elevation indicated above, is substantially impermeable to the passage of water, and shall perform in accordance with the 44 Code of Federal Regulations (44 CFR 60.3(c)(3).

All structural components are capable of resisting hydrostatic and hydrodynamic flood forces, including the effects of buoyancy, and anticipated debris impact forces.

I certify that the information in Section III on this certificate represents a true and accurate determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME	LICENSE NUMBER (or Affix Seal)		
Michael A Giovannozzi, PE	SC PE # 30306		
TITLE	COMPANY NAME		
Engineer	Michael A Giovannozzi, PE		
ADDRESS	CITY	STATE	ZIP CODE
534 28th St	West Palm Beach	FL	33407
SIGNATURE	DATE	PHONE	
	8/22/22	561-703-5230	

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30306 MICHAEL A GIOVANNOZZI

Copy all pages of this Floodproofing Certificate and all attachments for 1) community official, 2) insurance agent/company, and 3) building owner.

FLOOD RISK AMERICA

Flood Protection Solutions

American-Made Flood Protection

Protect Your Properties From Flooding

Custom- Fabricated Sizes, Lengths, Thickness, and Shapes

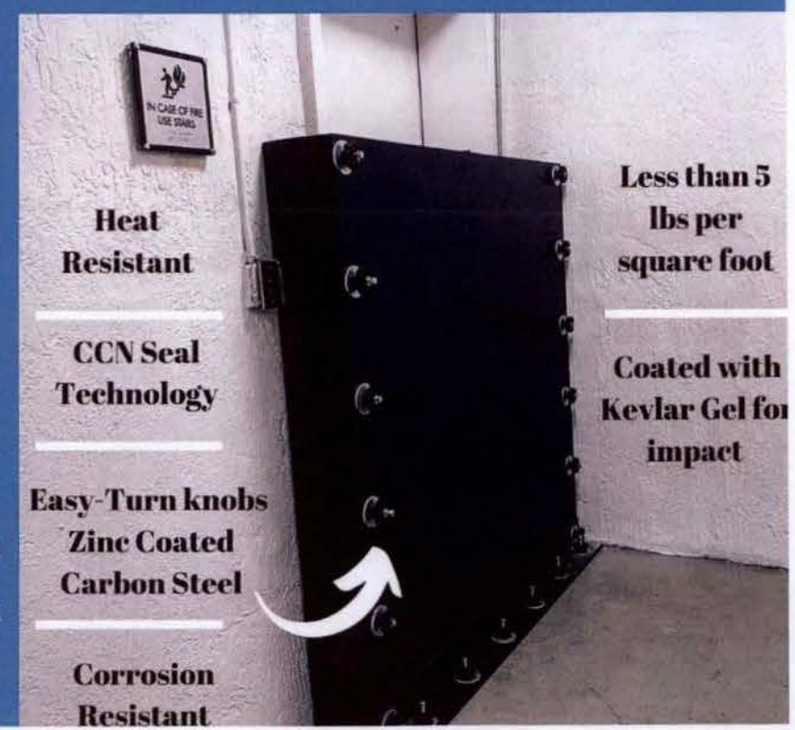
Contact Us

720 Lucerne Ave.
Suite 567
Lake Worth, FL 33460

561-578-4220

info@floodriskamerica.com

www.floodriskamerica.com



Heat Resistant

CCN Seal Technology

Easy-Turn knobs Zinc Coated Carbon Steel

Corrosion Resistant

Less than 5 lbs per square foot

Coated with Kevlar Gel for impact

FRA FLOOD PANEL

- Light-weight
- Marine-Grade Material
- Lifetime Warranty
- Made in USA
- Custom- Fabricated
- Withstands 13,000 PSI
- Cost-effective
- Easy to Deploy
- Exceeds ANSI 2510 requirements
- Color Options Available

FRA PANEL PROTECTION BOXES

The FRA Panel can be custom-designed to create a box for unmovable equipment such as generators, fuel tanks, electrical boxes, waste management systems, and all types of vulnerable equipment.

ELEVATOR PROTECTION

The FRA Panel was first designed to protect elevators from flooding, but it is now widely used to protect every vulnerable area of a property from flooding.

FLOOD RISK AMERICA

Flood Protection Solutions

Meets and Exceeds ANSI 2510 Requirements for Impact and Seepage

Superior bracing support to connect for longer lengths

Easy-Turn knob for fast deployment and tooless system

"You saved our property from flooding." - Pat

Our Products are Custom Made in America by Us

Endorsed by:

CHUBB

DOP Engineering, LLC

Product: Flood Risk America Flood Panels

Test Report No.: 21-02

FM Global 2510 Approval Standard for Flood Mitigation Equipment

Testing report for:

- **Hydrostatic Load Test**
  - *Approval Standard for Flood Mitigation Equipment*, Class 2510, Section 4.3.3
- **Dynamic Impact Load Test**
  - *Approval Standard for Flood Mitigation Equipment*, Class 2510, Section 4.3.4
- **Hydrostatic Load Test (Post-Impact)**
  - *Approval Standard for Flood Mitigation Equipment*, Class 2510, Section 4.3.3

Manufacturer:	Flood Risk America
Manufacturer Address:	720 Lucerne Ave Suite 567 Lake Worth, FL 33460
Testing Address:	2801 NW 55th Ct, Bldg #8W Fort Lauderdale, FL 33309

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Description of Test Chamber
The test chamber was constructed using Steel HSS tubes welded together to form the tanks overall size. Rough openings were constructed using Steel HSS tubes welded together to form the tanks overall size. 3/8" thick steel paneling was installed using steel welds in between the openings for the tanks infill. *Pictures provided in the photo section of this report.* - Steel HSS tube specifications at the Sill: 3"x8"x0.375" - Steel HSS tube specifications at the Jambs: 3"x8"x0.375" / 8"x8"x0.375" - Total overall Test tank dimensions: 270" wide x 48" tall x 24" depth (horizontal)

Equipment				
Instrument	Manufacturer	Model	Description	Calibrated
Weight Scale	PCE Americas Inc	PCE-CS 1000N	Measures the weight of the wood log	Yes, see reference documents attached
Tape Measure	Stanley	-	Measured the height of the water	No
Graduated Cylinder	N/A	N/A	2000 mL	N/A

Description of Specimen	
Specimen Number:	A-1
Overall Panel Size:	60" wide x 48" tall
Opening Size:	48" wide (open at the top)

Panel construction

Panel is composed of 2" high density foam material sandwiched between 2 skin panels which were measured to be approximately 1/8" thick. Adhered to the bottom of the frontside of the panel is a structural Fiberglass (FRP) angle, which was measured to be approximately 4" x 4" x 0.25" running the full length of the panel width. The finish of the system is a sprayed-on gel coat which is corrosion and water resistant. On the backside of the panel and beneath the FRP angle was a continuous Water-Resistant Closed Cell gasket measuring 3" wide and ½" thick. 1-1/8" access holes were drilled through the perimeter of the panel and the bottom of the FRP angle to allow for the fastening anchors.

Specimen Installation

Specimen was installed into the chambers rough opening with a face mounted configuration. Anchors used were 3/8" SS UNC Bolts with "FRA's easy turn knobs" and were measured at the following locations (facing the opening from the exterior):

- At the left jamb from the top, 2", 13", 24", 35", 46"
- At the right jamb from the top, 2", 13", 24", 35", 46"
- At the sill from the left corner, 5", 25", 35", 45", 55"

Gasket Compression

From ½" thick to approximately 5/16" thick

Hydrostatic Load Test (Pre-Impact)	
Maximum Designed Water Depth (h) = 4'-0"	
Specimen Number:	A-1
Pre-load water depth (10% of h)	5"
Pre-load duration	2 hrs
Total water seepage @ 15 min	Approximately 30 mL
Total water seepage @ 30 min	Approximately 15 mL
Total water seepage @ 45 min	Approximately 15 mL
Pre-load Results	**PASS**
Design load water depth (100% of h)	48"
Design load duration	20 hrs
Total water seepage	0 gal
Design load Results	**PASS**

Redeployment process

Upon completion of the 20-hour hydrostatic test, (2) of FRA's representatives removed the system completely from the opening. A witness from DOP Engineering observed the panels and did not find any tears, or other deficiencies with the gasket or anchors. The panels remained uninstalled for 15 minutes before the redeployment process was executed. During the deployment process no additional material or parts were added. The redeployment installation had a total duration of approximately 30 minutes with (2) people

Dynamic Impact Load Test	
Specimen Number:	A-1
Mass of the impact object	110.5 lbs
Description of the impact object	12" diameter wood log (SYP#2) x 12" long, with steel plates mounted in the back (dropped at 48") with 15 degree miter to create a point.
Energy of impact	600J
Impact #1 Location	Center of the panel vertically / Center of the panel horizontally
Impact #1 Results	**No breakage**
Impact #2 Location	Center of the panel vertically / Approximately 8" from the edge of the panel
Impact #2 Results	**No breakage**
Impact Results	**PASS**

Hydrostatic Load Test (Post-Impact)	
Maximum Designed Water Depth (h) = 4'-0"	
Specimen Number:	A-1
Pre-load water depth (10% of h)	5"
Pre-load duration	1 hrs
Total water seepage	0 gal
Pre-load Results	**PASS**
Design load water depth (100% of h)	48"
Design load duration	1 hrs
Total water seepage	0 gal
Design load Results	**PASS**

FLOOD RISK AMERICA

Proactive Flood Prevention Solutions

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- *Wall Anchor Location with Mounting Hardware (4"X4" Angles) ..... **Page 15***
- *Multiple Panel Deployment Procedure (Vertical Spline) .....**Page 16***
- *Multiple Panel Deployment Procedure (Horizontal Flange) .....**Page 17***

Read entire Instruction and Operations Manual to become familiar with the product. This product is a flood protection product. The effectiveness of this product is directly related to the proper installation and operation of this product. Failure to properly maintain this product will affect performance

NOTICE

To Contact Flood Risk America:

Phone: 561-578-4220

By Mail: Flood Risk America
720 Lucerne Ave, Suite 567
Lake Worth, FL 33460

Email: info@floodriskamerica.com

Website: www.floodriskamerica.com

24/7 Service

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.

FLOOD RISK AMERICA 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.

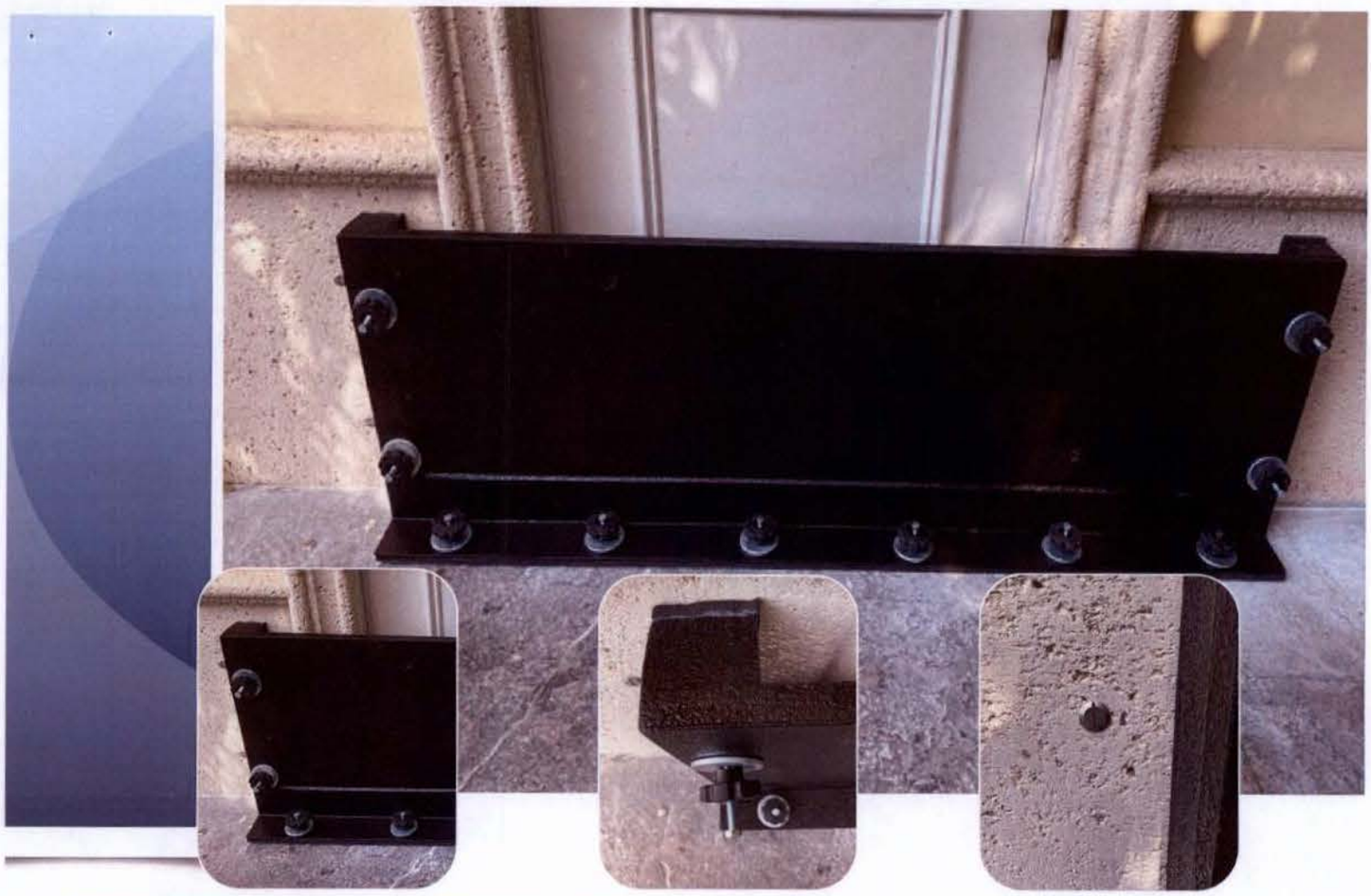
LIMITED WARRANTY

Flood Risk American ("FRA") warrants that the FRA Flood Panel sold to the Owner will be free of defects in design, materials and workmanship (ordinary wear and tear excepted) FRA warrants the anchoring components and gaskets to be free from defects in material and workmanship for a period of one (1) year from date of shipment. Any field labor charges incurred as a result of mis-handling, improper storage or owner's and/or their representative's failure to comply with this manual are the sole responsibility of the customer. To make a claim under this warranty, please contact Flood Risk America, in writing, at the address shown above. A lifetime warranty is provided on the FRA Flood Panel.

Thereafter, the customer may enter into a maintenance contract with associated charges that will apply to any repair or replacement of anchoring components and gaskets. Claims under this Limited Warranty must be made within 30 (thirty) days after shipping date. Unauthorized modification of this product voids the Flood Risk AMERICA Limited Product Warranty.

WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, AND FLOOD RISK AMERICA EXPRESSLY DISCLAIMS AND EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PURPOSE. FLOOD RISK AMERICA SHALL NOT BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES OF LAW, WITH RESPECT TO THE PRODUCTS SOLD OR SERVICES RENDERED BY FLOOD RISK AMERICA, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATING THERETO.

LIMITATION OF LIABILITY: IN NO EVENT SHALL FLOOD RISK AMERICA BE RESPONSIBLE FOR, OR LIABLE TO ANYONE FOR, SPECIAL, INDIRECT, COLLATERAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF FLOOD RISK AMERICA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Such excluded damages include, but are not limited to, personal injury, damage to property, loss of goodwill, loss of profits, loss of use, cost of cover with any substitute product, interruption of business, or other similar indirect financial loss.



WARRANTY REGISTRATION

Owner Name:_____ Product:_____

Company:_____ Quantity:_____

Address:_____ Date Installed:_____

City:_____ Inspected By:_____

State/Province:_____ Country:_____ Postal Code:_____

Warranty Registration Information shall be used solely for activation of warranty

IN ORDER TO VALIDATE THE WARRANTY, THE FOLLOWING FORM MUST BE COMPLETELY FILLED OUT AND RETURNED TO FRA AT THE ADDRESS LISTED ABOVE. FAILURE TO FILL OUT AND RETURN THIS FORM WILL VOID THIS LIMITED WARRANTY

INSPECTION AND MAINTENANCE

TO PREVENT DAMAGE TO CONTENTS, STORE DRY BETWEEN 40° AND 90° F.

Flood Risk America recommends that the owner implement a regular maintenance program to inspect all anchoring components, gaskets, and panels. This program may require the replacement of gaskets; touch up painting and accounting for of all the latching devices.

If the water height exceeds the level of any door penetrations or water protective design height, leakage will occur. Flood Risk America recommends a flood preparedness plan be developed, trained on, and implemented to be activated during times of potential flooding conditions.

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

Sealants: Inspect all sealants used on frames and connections to insure their effectiveness. Replace any cracked, loose, or otherwise non-performing sealants. Use only Flood Risk America approved products.

Lubrication: Periodically lubricate hardware and other components every year.

Cleaning: Inspect and clean finishes periodically, keep hardware and anchors free of any debris and keep the area clean throughout the operating area of the FRA Flood Panels.

Anchors: All anchors are engineered for load design and shall not be changed without Flood Risk America authorization.

Installation Instructions: It is important to verify the door opening to the door size before starting with the installation.

Please keep this Owners Operation and Maintenance manual for later reference and read them before attempting any maintenance, operation, or storage of the product.

-Flood Risk America

Door sill / Door and Window Jams:

1. Clean floor sill and sidewall jambs. Keep area clean.

2. Measure door-opening width at the top

3. Measure door-opening width at the floor

4. Measure door-opening height at left side

5. Measure door-opening height at right side

6. Surface MUST be level and plumb

Protect all gaskets and hardware. Always consult Flood Risk America for all installation dimensions, details, hardware, and specifications. Check gaskets around perimeter of opening.

When the FRA Flood Panel is not deployed, an anchor cap seal is used to protect the Anchors. Inspect and clean periodically. Keep all bolts, nuts, dock washers and associated hardware clean.

NOTICE

FRA FLOOD PANEL SAFETY PRECAUTIONS

The FRA Flood Panel is a specially designed Flood Panel Barrier capable of providing floodwater protection. FRA Flood Panel is specifically manufactured to meet individual window or door opening dimensions to a Water Protective Height of each customer's specific site requirements. Due to the custom design each FRA Flood Panel, they will not look the same and will not anchor the same. Refer to installation shop drawings and related construction documentation for specific installation details for each panel.

The Flood Risk America Flood Panel system is to be installed in accordance with FRA's standard design, specification, and fabrication methods for Custom Flood Panels. This product is a flood protective barrier. The effectiveness of the product is directly related to its proper installation and maintenance. Failure to properly maintain this product will affect the product's performance.

GENERAL INFORMATION:

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

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

WARNING

OPERATION GUIDELINES

The following procedures and information are supplied for the operation of the FRA Flood Panel Barrier assemblies. Operation in a manner other than intended could result in damage or less than acceptable performance at time of need, for which Flood Risk America will not be held responsible. Always plan for potential leakage and condensation that can occur during flooding conditions.

SAFETY PRECAUTIONS:

IMPORTANT

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

OPERATION UNDER FLOODING CONDITIONS:

Pre-flooding or Potential Flooding Conditions:

- Conduct Inspection and Maintenance activities as described in this Operations & Maintenance Manual and in accordance with any Flood Maintenance Plan and Emergency Action Plan.
- Ensure the FRA Flood Panel system is located near each required opening priorto flooding conditions and is deployed for placement when needed.

Flooding Conditions Present:

- Ensure FRA Flood Panel system remains fully anchored when flood eventconditions are present.
- Check FRA Flood Panel system for leakage or condensation accumulationduring flood conditions

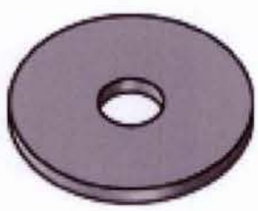
THIS IS A FLOOD PROTECTION BARRIER. NEVER OPEN DURING ANY FLOODING CONDITIONS AS WATER LEAKAGE WILL OCCUR AND YOU WILL NOT BE ABLE TO RE-CLOSE THE BARRIER.

Picture Guide For FRA Flood Panel Installation

Snake or Hilti Anchor

Anchor Set Tool

Hex Bolt



3" Dock Washer with gasket faces

FRA Easy Turn Knob

FRA Flood Panel Installation

Use caution when unpacking upon delivery. To reduce the risk of damaging gaskets do not use a razor blade or box knife or any other sharp instrument to unpack the panels. Check packing list to make sure all hardware is present.

FRA Flood Panels, in most cases, can be installed with one person, although it can be significantly easier with 2 people. There are some cases where 2 people are required to safely install the **FRA Flood Panel.**

- The panel comes with holes pre-drilled in predetermined locations
- Temporarily set the panel making sure the panel is level and square.
- Use extreme caution with the panel in windy situations.
- Use a pencil or marker to mark all the holes on the left and right verticals.
- The holes are larger than the bolt size.
- Make your mark on the bottom half of the holes.

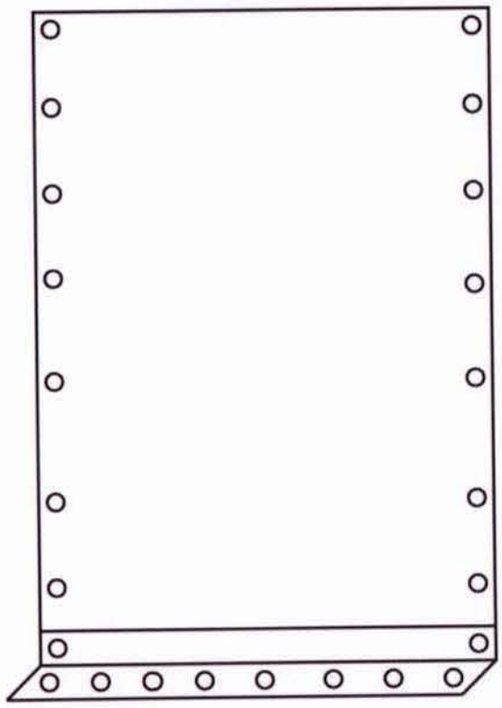
Do not mark the sill plate holes at this time. Remove The FRA Flood Panel

FRA Flood Panels hole. Make mark on bottom half of elongated hole.

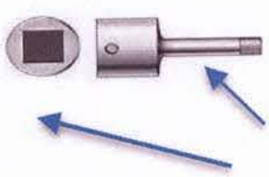
Use a proper drill to drill all marked holes. Refer to your architectural drawings to find what size holes you will be drilling. Drills and drill bits may vary depending on the material penetrated. Caution should be taken to utilize the appropriate tools when drilling. Refer to the Buildings Finish Materials's manufacturing specifications to become familiar with the material penetrated.

IMPORTANT

- Do not drill the holes too deep.
- Refer to anchor manufacturer's specifications for depth guide.

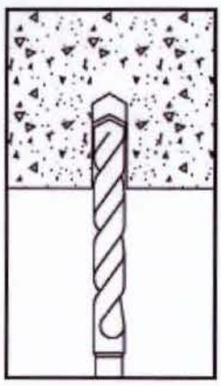


Anchor Installation Tools Needed:



Drill/Drill Bit

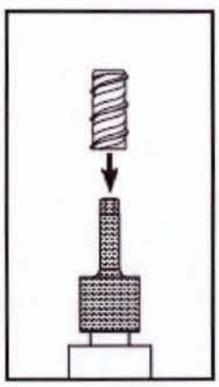
Anchor Installation



Step 1

Using the proper drill bit size, drill a hole into the base material to the required depth.

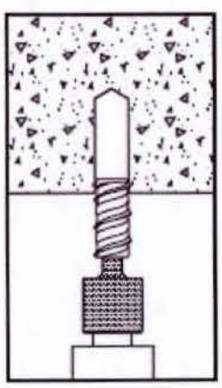
******DO NOT DRILL THE HOLE TOO DEEP.***



Step 2

- *Select a powered impact wrench that does not exceedthe maximum torque for the selected anchor diameter.*
- *Attach the Snake plus setting tool supplied byPowers Fasteners to the impact wrench.*
- *Mount the anchor onto the setting tool.*

Fill Anchor hole with a construction adhesive



Step 3

Drive the anchor into the hole until the shoulder of the Snake+ setting tool comes into contact with the surface of the base material.

Do not spin the setting tool off the anchor to disengage.

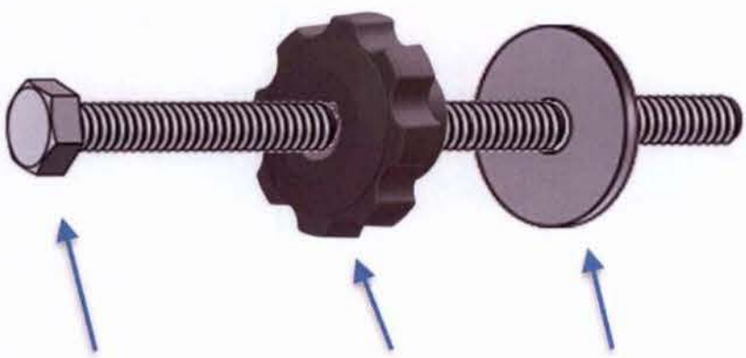
Refer to epoxy manufacturer for epoxy set times.

Make sure epoxy is fully set before you proceed.

Step 4

Insert threaded rod or a bolt into the Snake+, taking care not to exceed the maximum specified tightening torque of the steel insert element.

The anchors are set. You can now proceed to assembling the hardware.



Bolt

FRA Easy Turn Knob

3" Dock Washer

**Optional Dock washer with gasket faces

IMPORTANT

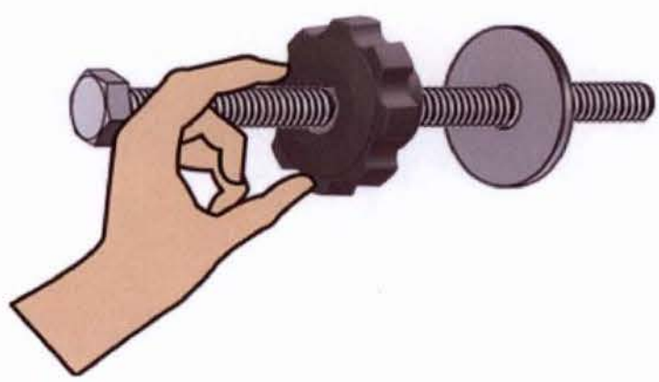
- Place FRA **Flood Panel** back in place.
- Make sure that all anchors are in line with all anchor holes.
- Place all vertical hardware and hand tighten the FRA Easy Turn Knob onto the anchors. Hand tightening is all that is necessary.

NOTE: Ensure the proper anchor is installed as per site specific shop drawing which is provided with each installation project

NOTICE

- **Do NOT over tighten.**
- **Over tightening can cause the anchor to fail, which could cause a complete failure of the flood panel.**
- Starting at eye level, begin to tighten until you see the gasket compress.
- Once you see compression of the gasket move on to the next hole.
- Work from side to side. You are only looking for compression of the gasket.
- Drill the final holes for the sill plate.
- Remove FRA Flood Panel
- Drill Floor Material and set the anchors for the sill plate.

Recommendation: Take 2 pieces of 11' all-thread (not included) and place them in the holes at eye level. Hand- tighten all-thread into anchor.

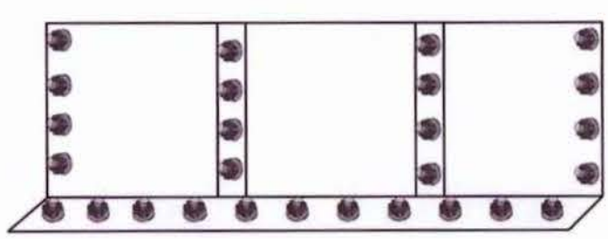


Final Installation

- Place **FRA Flood Panel** back in place, paying close attention to make sure panel aligns with wall anchors.
- Mount the panel's side hardware for the final Installation.
- Begin tightening the lower vertical hardware. **DO NOT TIGHTEN ALL THE WAY DOWN.**

NOTICE

- As you begin tightening the lower side hardware, alternating from side to side, you will begin to see the anchors of the sill plate.
- Once the sill plate anchors are centered in the sill holes, place all sill plate bolts into the anchors.
- Begin tightening the sill hardware. Before the sill plate hardware is tightened all the way, loosen all vertical hardware.
- You can now tighten all sill plate hardware. **(Only tighten until you see gasket compression).**
- **Do Not Over Tighten. Over tightening can cause the anchor to fail, which could cause a complete failure of the flood panel.**
- After the sill plate gasket is compressed, you can retighten all vertical hardware. Only tighten until you see gasket compression.



Wall Anchor Location with Mounting Hardware (4"X 4" Angles) (Vertical Mounting Hardware Deployment Procedure)

In the event FRA Panel deployment requires mounting to the butt end of the building (as opposed to face mounting), a 4" x 4" FRP angle (mounting hardware) is provided. For this mounting condition, the following deployment procedure should be utilized.

- Remove all sidewalk bolts in the preset walls and floor anchors.
- Set the mounting hardware in place aligning the holes in the mounting hardware with the anchors in the wall and floor slab.
- Securely attached the mounting hardware to the wall and floor slab ensuring good (approximately 25%) gasket compression at all wall, floor and mounting hardware interfaces.
- All individual panels should be set in place to confirm proper alignment with all anchors in the floor slab and in the mounting hardware.
- Temporary connecting of individual panels will need to occur.
- Connect one side and bottom of the overall opening to be anchored the mounting hardware, only slightly tightening all connections.
- Slide the next individual panel into the panel just deployed and anchor the two panels together with the patented FRA Tightening Knobs, only slightly tightening all connections.
- "IMPORTANT" Take note that the 3" diameter dock washers for these locations are provided with ¼" gasket's on both faces MUST be utilized at the spline connection locations.
- Continue this procedure until all individual panels are connected vertically along the mounting hardware (at each end of the opening), to the floor slab and to one another.
- Ensure all gaskets are tight to the structure and perform final tightening of all hardware, making sure to NOT over tighten the connections. Proper tightening is accomplished when the normal gaskets being approximately 25% compressed. In the event of uneven mounting surface, we provide a "soft sponge" gasket. When this "soft sponge" gasket is utilized, the gasket compression should be to 80% to 90%.
- DO NOT over tighten. Over tightening can cause anchors to pull from the building which could cause a complete failure of the flood panel system.

Multiple Panel Deployment Procedure
(Vertical Spline Deployment Procedure)

In the event FRA Panel deployment requires multiple panels to be joined side by side, to accommodate larger openings, a vertical tongue and groove connection is provided. The following deployment procedure should be utilized when connecting panels side by side.

- Remove all sidewalk bolts in the preset walls and floor anchors.
- All individual panels should be set in place to confirm proper alignment with all anchors.
- Temporary connecting of all individual panels will need to occur.
- Connect one side of the overall opening to be anchored the building and connect the panel to the building, only slightly tightening all connections.
- Connect the bottom of the first individual panel to the structure, only slightly tightening all connections.
- Slide the next individual panel into the panel just deployed and anchor the two panels together with the patented FRA Tightening Knobs, only slightly tightening all connections.
- "IMPORTANT" Take note that the 3" diameter dock washers for these locations are provided with ¼" gasket's on both faces MUST be utilized at the spline connection locations.
- Continue this procedure until all individual panels are connected along the walls (at each end of the opening), the bottom and to one another.
- Ensure all gaskets are tight to the structure and perform final tightening of all hardware, making sure to NOT over tighten the connections. Proper tightening is accomplished when the normal gaskets being approximately 25% compressed. In the event of uneven mounting surface, we provide a "soft sponge" gasket. When this "soft sponge" gasket is utilized, the gasket compression should be to 80% to 90%.
- DO NOT over tighten. Over tightening can cause anchors to pull from the building which could cause a complete failure of the flood panel system.
- Ensure there is good (min. 50%) gasket compression against the gasketed dock washers at all tightening knob locations.

(Horizontal Flange Deployment Procedure)

In the event FRA Panel deployment requires multiple panels to be stacked, to accommodate larger openings in eight, a horizontal "flanged" connection is provided. The following deployment procedure should be utilized when stacking panels on top of one another.

- Remove all sidewalk bolts in the preset walls and floor anchors.
- All individual lower panels should be set in place to confirm proper alignment with all anchors.
- Temporary connecting of all individual panels will need to occur.
- Stack the next panel on top of the already "in place" panel(s) and anchor the two panels together with the patented FRA Tightening Knobs, only slightly tightening all connections
- Continue this procedure until all individual panels are connected along the walls (at each end of the opening), the bottom and to one another.
- Ensure all gaskets are tight to the structure, and stacking flanges, and perform final tightening of all hardware, making sure to NOT over tighten the connections. Proper tightening is accomplished when the normal gaskets being approximately 25% compressed. In the event of uneven mounting surface, we provide a "soft sponge" gasket. When this "soft sponge" gasket is utilized, the gasket compression should be to 80% to 90%.

Storage

- Remove **FRA Flood Panel** from wall and slab anchors.
- Inspect all hardware and gaskets to ensure integrity.
- Documents any adverse conditions. Replace any damaged gaskets or hardware as required. Use only FRA approved gaskets and hardware
- **NEVER** transport panels in a manner that will damage or compress any gaskets or hardware.
- **NEVER** store panels in a manner that will damage or begin to compress any gaskets or hardware
- Panels should be stored horizontally with all gaskets facing upward. Wood cribbing should be utilized to separate panels and avoid adjacent panels from compressing any gaskets.
- **NEVER** store the first panel directly on the floor surface. Provide wood cribbing to allow the first panel to be elevated off the floor surface.
- **NEVER** store any items on the panels including provided hardware.
- **Do Not Over Tighten. Over tightening can cause the anchor to fail, which could cause a complete failure of the flood panel.**

FLOOD RISK AMERICA

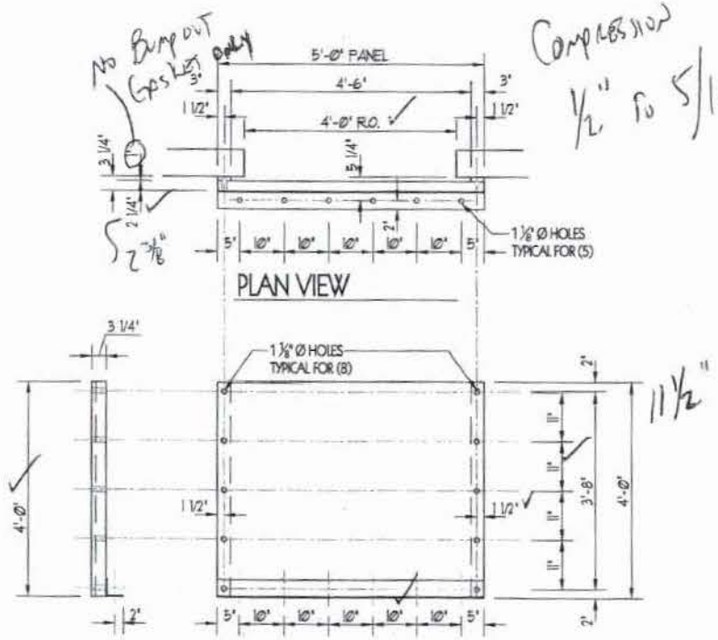
Flood Protection Solutions

FLOOD RISK AMERICA

720 Lucerne Ave Suite 567
Lake Worth, FL 33460

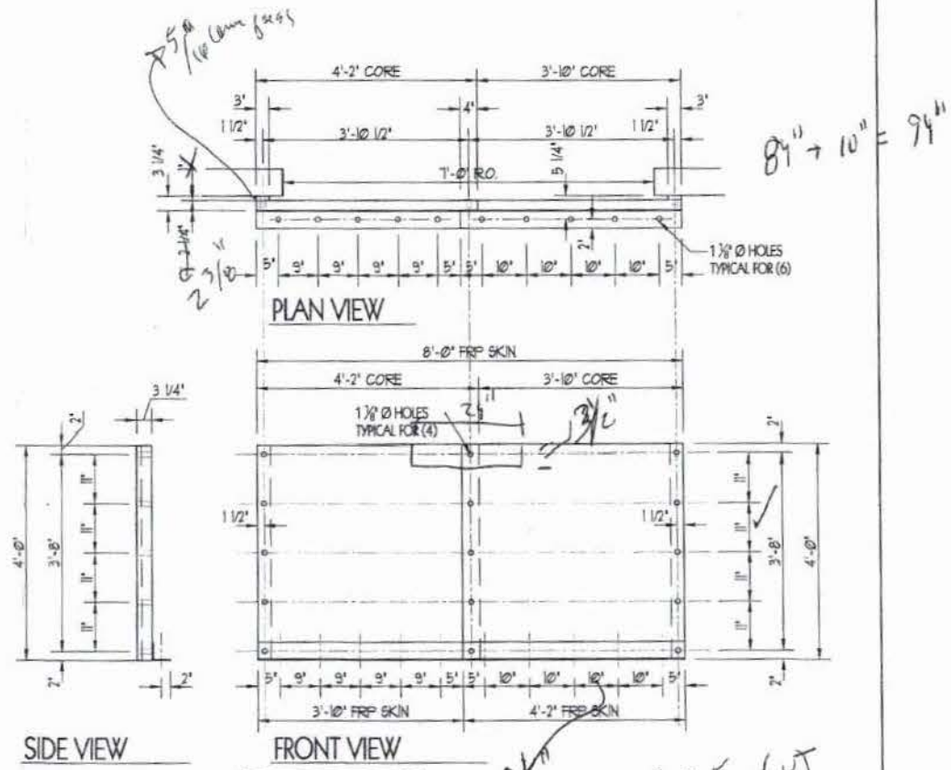
Phone: (561) 578-4220

www.floodriskamerica.com



PANEL 1

QTY = 1



84" + 10" = 94"

9 1/4"

FRP TUBE CUT.

PANEL 2

QTY = 1

10%

P1 WETTED PERIMETER =

P2 WETTED PERIMETER = 94"

FRA SHOP DRAWING REVIEW

FRA TEST PANEL
FM 2510 TESTING 2021

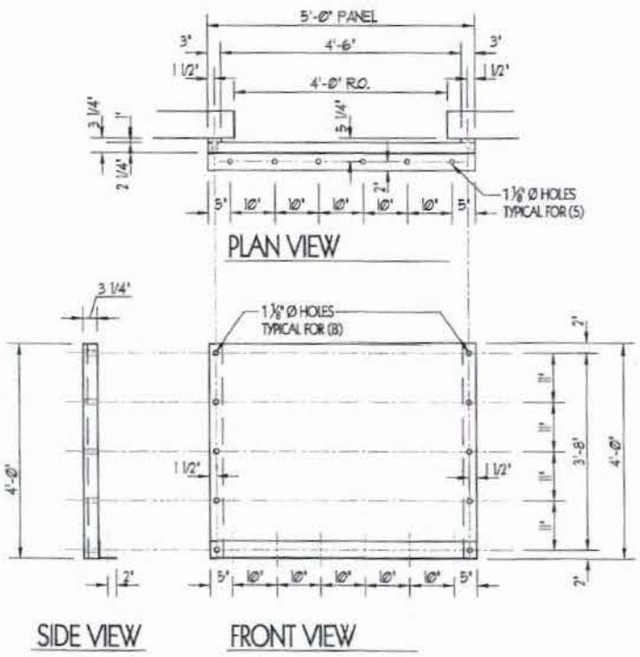
FLOOD RISK AMERICA

720 LUCERNE AVENUE
LAKE WORTH, FLORIDA 33460
561-575-6220 www.floodriskamerica.com

Revisions

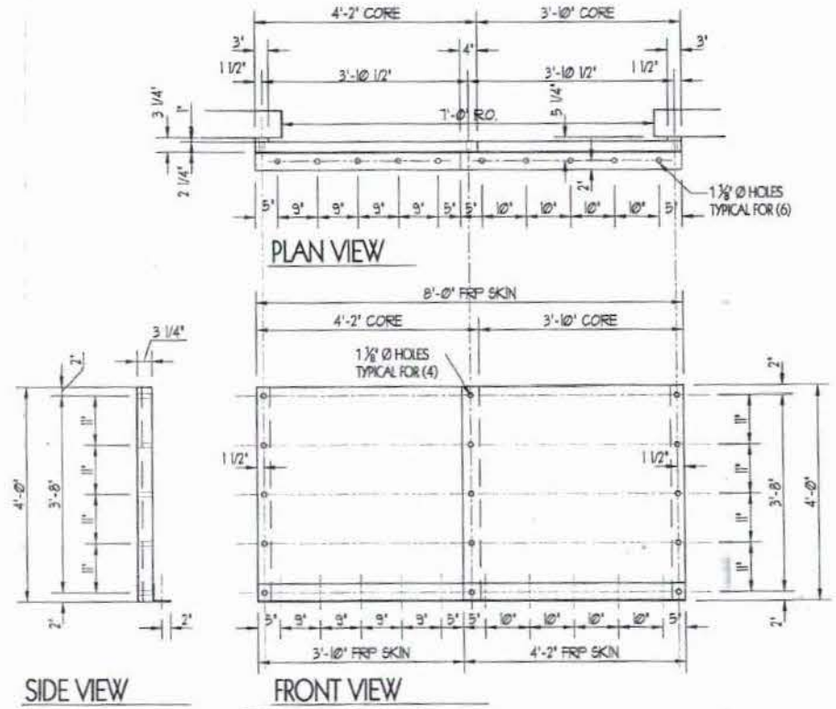
Date	Description

1-19-21
AS NOTED
DMB
DMB
FRA Proj. No.
Dwg. No.
1 of 1



PANEL 1

QTY = 1



PANEL 2

QTY = 1

FRA SHOP DRAWING REVIEW ☐ APPROVED ☐ APPROVED AS NOTED (RESUBMISSION NOT REQUIRED) ☐ APPROVED AS NOTED, RESUBMISSION REQUIRED ☐ REJECTED, RESUBMISSION REQUIRED	FRA TEST PANEL FM 2810 TESTING 2021	FLOOD RISK AMERICA 728 LUCERNE AVENUE LAKE WORTH, FLORIDA 33460 561-673-4328 www.floodriskamerica.com	Revisions: Date / Description	Date: 1-18-21 Scale: AS NOTED Drawn: DMB Checked: DMB FRA Proj. No. Dwg. No. 1 of 1

NOTES:

STORAGE-HANDLING
DO NOT STORE FLOOD PANELS IN A MANNER THAT WILL COMPRESSOR DAMAGE GASKETS OR THAT WILL CAUSE DAMAGE TO THE PANELS, CHANNELS, ANGLES, OR ANCHORING HARDWARE. FLOOD RISK AMERICAS IS NOT RESPONSIBLE FOR ANY DAMAGE TO THE PANELS, GASKETS, CHANNELS, ANGLES, OR ANCHORING HARDWARE CAUSED BY STORAGE CONDITIONS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACE OF BARRIERS WITH OUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED).

MAINTENANCE - INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANT, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL ANALYSIS OF THE BUILDING'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS THAT ARE TRANSFERRED TO THE STRUCTURE SHALL BE PERFORMED BY THE STRUCTURE'S EOR AND IS BASED ON SERVICE LOADS AS INDICATED ON THESE PLANS. FLOOD RISK AMERICA IS NOT RESPONSIBLE TO ENSURE THE BUILDING'S ABILITY TO HANDLE THE IMPOSED LOADS AND SHALL NOT BE RESPONSIBLE FOR EXISTING / AS BUILT FIELD CONDITIONS THAT VARY FROM THESE PLANS.

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC , HYDRODYNAMIC AND DEBRIS IMPACT LOADS UP TO THE DESIGNED WATER HEIGHT NOTED ON THESE DRAWINGS ALONG WITH ALL LOAD REQUIREMENTS AS NOTED IN FEMA TECHNICAL BULLETIN 3-JANUARY 2001 & ASCE 24-14. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE OR CONDENSATION THAT WILL OCCUR DURING FLOODING CONDITIONS. IN APPLICATIONS WHERE THE FLOOD PANEL GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

DESIGN CRITERIA

DESIGN LOADS

PANELS ARE DESIGNED TO WITHSTAND THE FOLLOWING;

1) HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF).

2) HYDRODYNAMIC LOADS ON VERTICAL SURFACES OF MOVING FLOODWATERS AT 5 FEET PER SECOND

3) DEBRIS IMPACT LOAD OF A 1,000 lb OBJECT FOR A 1 SECOND DURATION

ANCHORAGE
ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO STRUCTURE CALLED OUT IN THE DRAWINGS. FLOOD RISK AMERICA PANELS ARE TO BE ANCHORED INTO CEMENTICIOUS MATERIAL. ANY SUBSTRATE OTHER THAN THAT AS NOTED VOIDS THE WARRANTY OF THE PANELS AND THE ANCHORING SYSTEM. FLOOD RISK AMERICA IS NOT RESPONSIBLE FOR FASTENING OF PRODUCT INTO LESS THAN IDEAL FIELD CONDITIONS OR MOUNTING TO A STRUCTURE OTHER THAN WHAT IS DETAILED ON THE DRAWINGS.

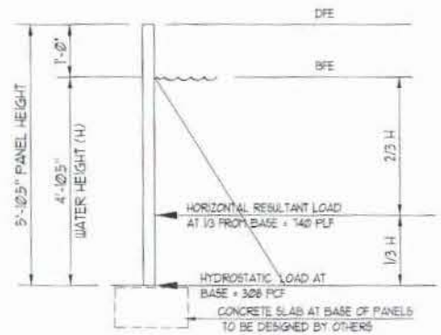
DUE TO VARIABILITY TO EXISTING MOUNTING STRUCTURE, FLOOD RISK AMERICA IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN THAT VARY FROM THESE DRAWINGS OR INTO LESS THAN IDEAL FIELD CONDITIONS. FLOOD RISK AMERICA PRODUCTS FASTENING SYSTEMS ARE DESIGNED BASED ON CONCRETE OR 8" GROUT-FILLED CMU MASONRY (ASTM C90) MOUNTING STRUCTURE, UNLESS OTHERWISE INDICATED ON THESE DRAWINGS. ANY ANCHORING SUBSTRATE THAT VARIES FROM THESE REQUIREMENTS SHALL BE EVALUATED BY FRA ENGINEERS AND FRA SHALL BE COMPENSATED FOR THE ENGINEERING OF ANCHORS MOUNTED INTO SAID VARIED SUBSTRATES .

IF FIELD CONDITIONS DIFFER FROM THESE PLANS, FLOOD RISK AMERICA REQUIRES THAT MODIFICATIONS OF THE ANCHOR MOUNTING TO THE STRUCTURE BE DESIGNED AND REVIEWED BY BUILDING'S EOR, BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING THESE DRAWINGS.

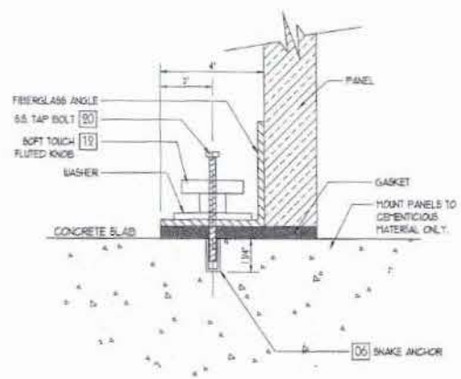
REFER TO ANCHOR MANUFACTURES TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.

MATERIAL LIST

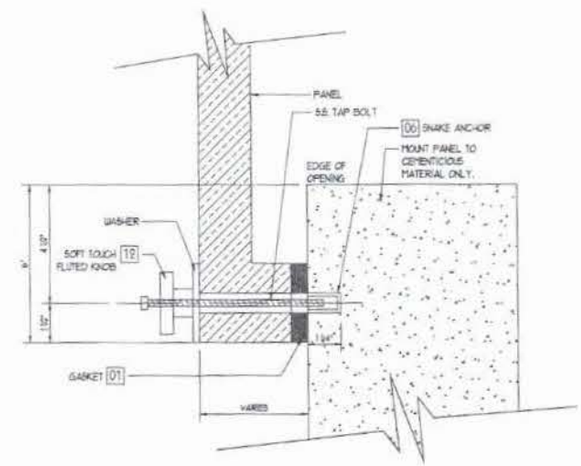
ITEM NO.	PART NO.	DESCRIPTION	QTY	PCS
01	-	10" x 3" EDN GASKET	16 LF	-
04	-	10" x 6" EDN GASKET	8 LF	-
06	-	3/8" x 1 3/4" SNAKE ANCHOR	51	-
7	-	3/8" SS NORMALIZ BOLT	51	-
13	-	2.5x3" SOFT TOUCH FLUTED KNOB 1/4-20 INSERT STEEL ZNC	51	-
19	-	2" SALV DOOR WASHER	51	-
20	-	3/8" x 4" GRADE 8 ANT ZNC COATED CARBON STEEL TAP BOLT	8	-
21	-	3/8" x 8" GRADE 8 ANT ZNC COATED CARBON STEEL TAP BOLT	40	-
40	PANEL 4	DOOR PANEL 30"L x 30"W x 3 1/4"H - 1	1	1
46	PANEL 5	DOOR PANEL 30"L x 30"W x 3 1/4"H - 1	1	1
47	PANEL 6	DOOR PANEL 30"L x 30"W x 3 1/4"H - 1	1	1



FLOOD LOADING CONDITION
GROUND MOUNTED PANELS



CONNECTION DETAIL C1
DOOR PANEL TO CONC.
SCALE: 6"=1'-0"



CONNECTION DETAIL D1
CONCRETE
SCALE: 6"=1'-0"

FRA SHOP DRAWING REVIEW
☐ APPROVED
☐ APPROVED AS NOTED (RESUBMITTAL NOT REQUIRED)
☐ APPROVED AS NOTED, RESUBMITTAL REQUIRED
☐ REJECTED, RESUBMITTAL REQUIRED

COMPANY NAME
SIGNATURE DATE
TITLE

KINGSTON BREWHOUSE ADDITIONAL
MYRTLE BEACH, SC

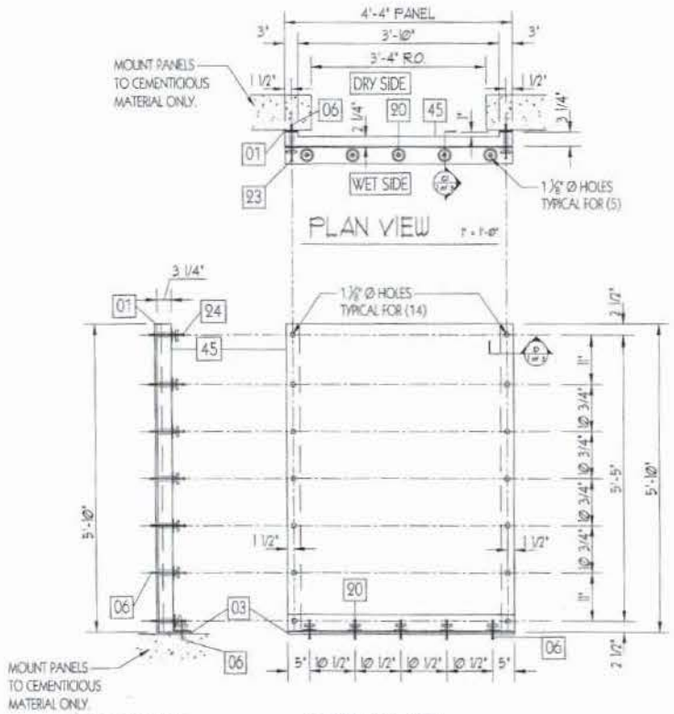
FLOOD RISK AMERICA

720 LUCERNE AVENUE
LAKE WORTH, FLORIDA 33460
561-878-4220 www.floodriskamerica.com

Revisions:

Date	Description

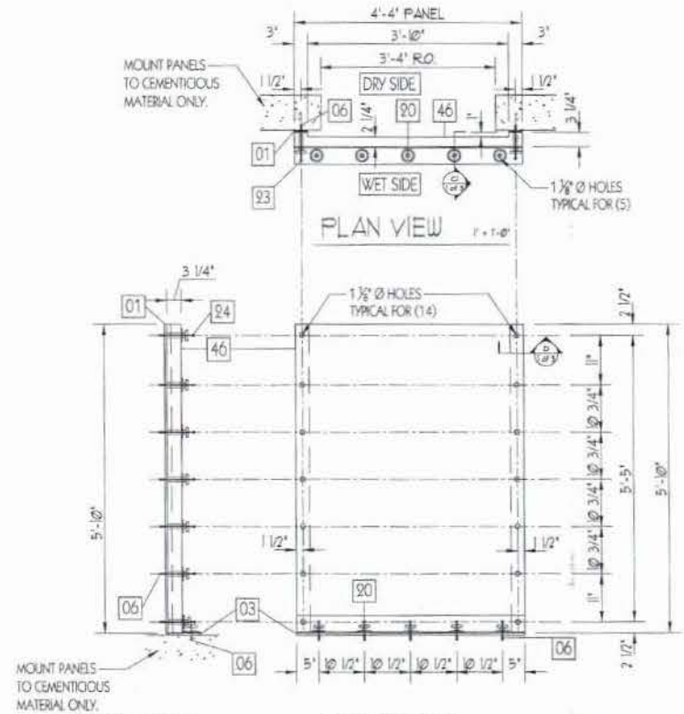
Date: 8-1-22	FRA Proj. No: 24222
Scale: AS NOTED	
Drawn: JLB	Dwg. No: 1 of 3
Checked: DMB	



NOTES:
1. PANELS VIEWED FROM WET SIDE.

PANEL 1
MEN'S BATH
QTY = 1

Approx. Panel Weight = 80 lb



NOTES:
1. PANELS VIEWED FROM WET SIDE.

PANEL 2
WOMEN'S BATH
QTY = 1

Approx. Panel Weight = 80 lb

FRA SHOP DRAWING REVIEW
☐ APPROVED
☐ APPROVED AS NOTED (RESUBMISSION NOT REQUIRED)
☐ APPROVED AS NOTED (RESUBMISSION REQUIRED)
☐ REJECTED (RESUBMISSION REQUIRED)

KINGSTON BREWHOUSE ADDITIONAL
MYRTLE BEACH, SC

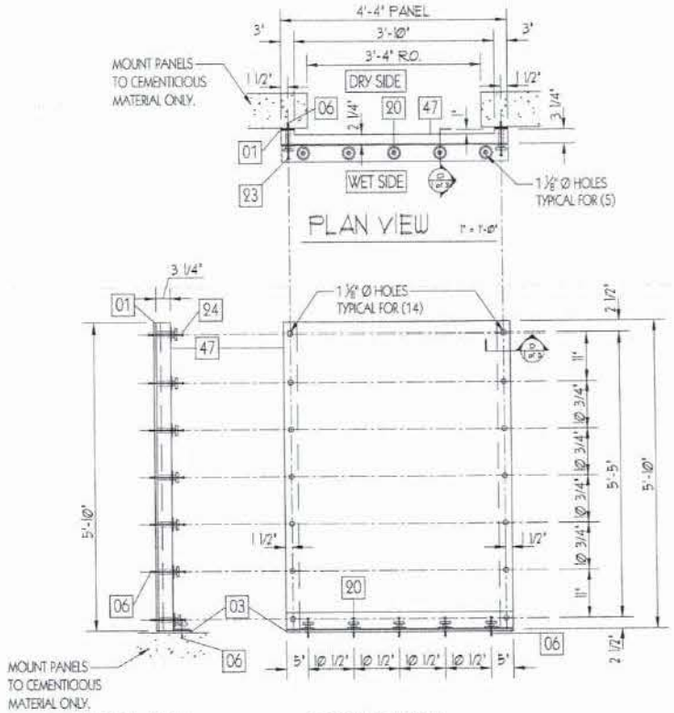
FLOOD RISK AMERICA

726 LUCERNE AVENUE
LAKE WORTH, FLORIDA 33460
561-478-4326 www.floodriskamerica.com

Revisions:

Date	Description

Date: 6-1-22	FRA Proj. No: 24222
Scale: AS NOTED	
Drawn: JLB	Dwg. No. 2 of 3
Checked: DMB	



NOTES:
1. PANELS VIEWED FROM WET SIDE.

PANEL 3
FAMILY BATH
QTY = 1

Approx. Panel Weight = 80 lb

FRA SHOP DRAWING REVIEW
- ☐ APPROVED
- ☐ APPROVED AS NOTED (RESUBMISSION NOT REQUIRED)
- ☐ APPROVED AS NOTED, RESUBMISSION REQUIRED
- ☐ REJECTED, RESUBMISSION REQUIRED

COMPANY NAME
SIGNATURE DATE
REVIEWED BY

KINGSTON BREWHOUSE ADDITIONAL
MYRTLE BEACH, SC

FLOOD RISK AMERICA

720 LUCERNE AVENUE
LAKE WORTH, FLORIDA 33460
561-576-4226 www.floodriskamerica.com

Revisions:

Date	Description

Date: 6-1-22	FRA Proj. No: 24222
Scale: AS NOTED	
Drawn: JLS	Dwg. No.
Checked: DGB	3 of 3

NOTES:

STORAGE-HANDLING

DO NOT STORE FLOOD PANELS IN A MANNER THAT WILL COMPRESS OR DAMAGE GASKETS OR THAT WILL CAUSE DAMAGE TO THE PANELS, CHANNELS, ANGLES, OR ANCHORING HARDWARE. FLOOD RISK AMERICA IS NOT RESPONSIBLE FOR ANY DAMAGE TO THE PANELS, GASKETS, CHANNELS, ANGLES, OR ANCHORING HARDWARE CAUSED BY STORAGE CONDITIONS.

INSTALLATION

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STRUCTURAL ANALYSIS OF THE BUILDINGS CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS THAT ARE TRANSFERRED TO THE STRUCTURE SHALL BE PERFORMED BY THE STRUCTURE'S EOR AND IS BASED ON SERVICE LOADS AS INDICATED ON THESE PLANS. FLOOD RISK AMERICA IS NOT RESPONSIBLE TO ENSURE THE BUILDINGS ABILITY TO HANDLE THE IMPOSED LOADS AND SHALL NOT BE RESPONSIBLE FOR EXISTING / AS BUILT FIELD CONDITIONS THAT VARY FROM THESE PLANS.

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DESIGN CRITERIA

DESIGN LOADS

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2) HYDRODYNAMIC LOADS ON VERTICAL SURFACES OF MOVING FLOODWATERS AT 5 FEET PER SECOND.

3) DEBRIS IMPACT LOAD OF A 1,000 lb OBJECT FOR A 1 SECOND DURATION.

ANCHORAGE

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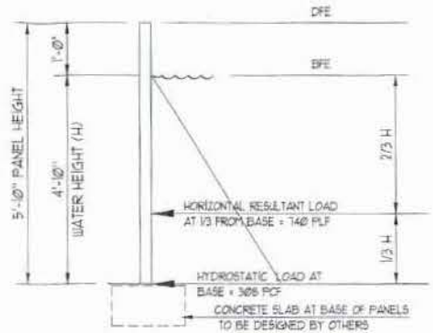
REFER TO ANCHOR MANUFACTURES TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.

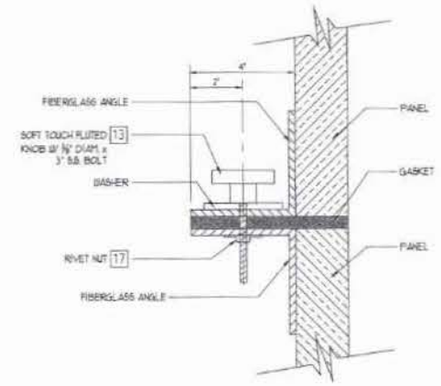
MATERIAL LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY	PCS
01	-	01" x 3" EDGE GASKET	36 LF	-
04	-	01" x 6" EDGE GASKET	36 LF	-
06	-	3/8" x 1 3/4" SNAKE ANCHOR	40	-
8	-	3/8" SS. MEDIUM BOLT	40	-
13	-	3/4" SOFT TOUCH FLUTED KNOB W/ 3/4" DIAM. INSERT, STEEL ZNC	40	-
13	-	3/4" SOFT TOUCH FLUTED KNOB W/ 3/4" DIAM. x 3" SS. BOLT	8	-
17	-	RIVET NUT	8	-
19	-	3" BALL DOOR BARRIER	16	-
20	-	3/8" x 4" SNAKE ANPT. ZNC COATED CARBON STEEL TAP BOLT	8	-
22	-	3/8" x 5" SNAKE ANPT. ZNC COATED CARBON STEEL TAP BOLT	36	-
45	PANEL 5	DOOR PANEL 48"L x 18"H x 2.5 24"W - 1	1	1
46	PANEL 5	DOOR PANEL 84"L x 18"H x 2.5 24"W - 2	1	2



FLOOD LOADING CONDITION

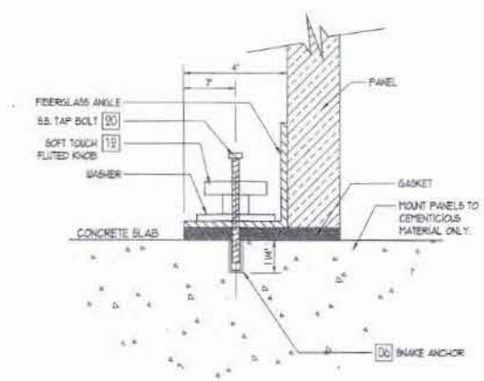
GROUND MOUNTED PANELS



SPLINE DETAIL A1

PANEL TO PANEL

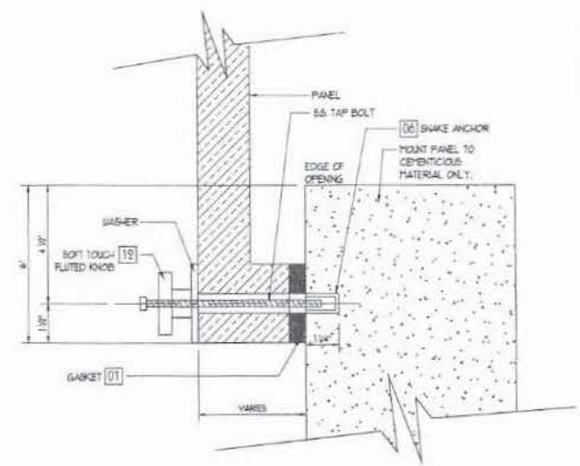
SCALE: 6"=1'-0"



CONNECTION DETAIL C1

DOOR PANEL TO CONC.

SCALE: 6"=1'-0"



CONNECTION DETAIL D1

CONCRETE

SCALE: 6"=1'-0"

FRA SHOP DRAWING REVIEW

☐ APPROVED
☐ APPROVED AS NOTED (RESUBMISSION NOT REQUIRED)
☐ APPROVED AS NOTED (RESUBMISSION REQUIRED)
☐ REJECTED (RESUBMISSION REQUIRED)

COMPANY NAME

SIGNATURE DATE

PRINTED NAME

KINGSTONE BREWHOUSE POOL PUMP ROOM
MYRTLE BEACH, SC

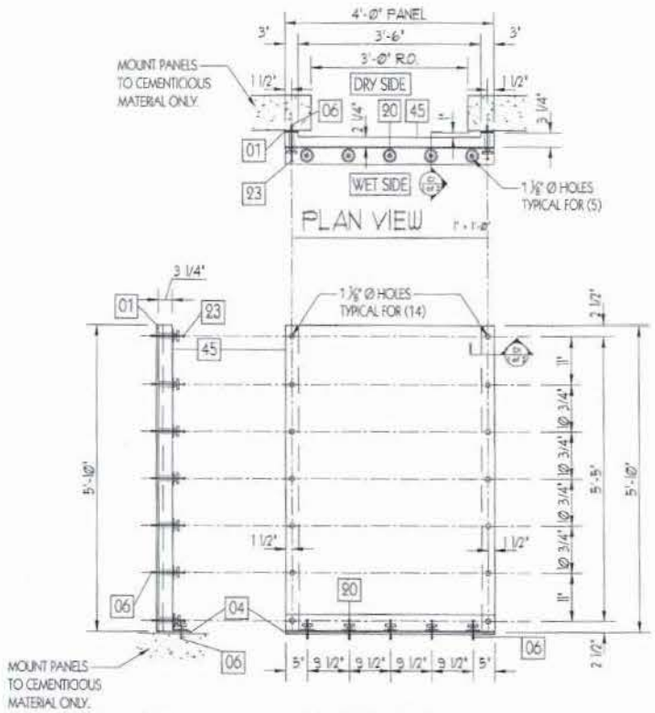
FLOOD RISK AMERICA

720 LUCERNE AVENUE
LAKE WORTH, FLORIDA 33460
561-579-4226 www.floodriskamerica.com

Revisions:

Date	Description

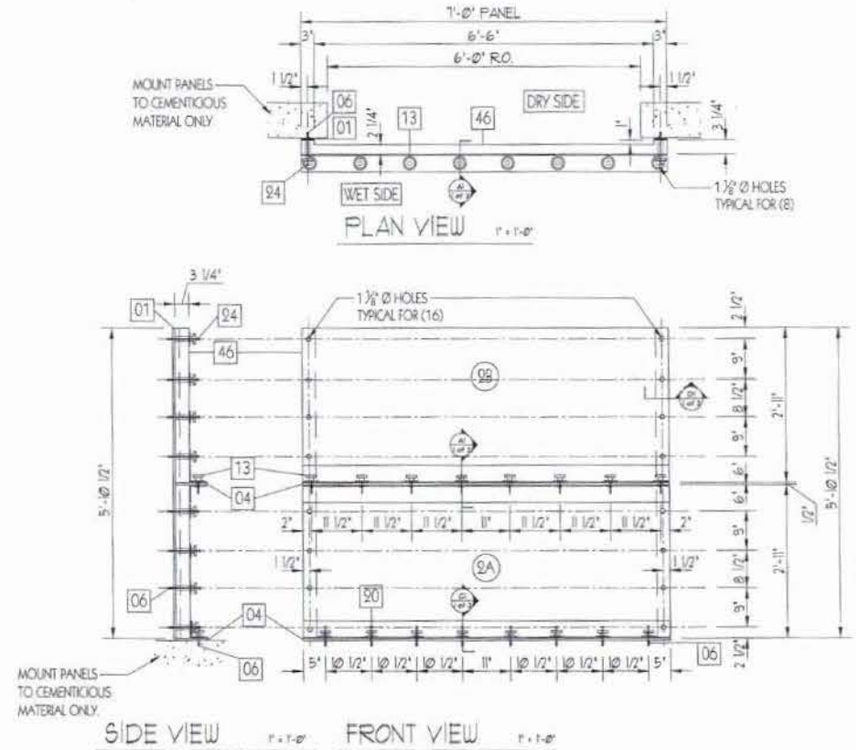
Date: 7-19-22	FRA Proj. No: 24222
Scale: AS NOTED	
Drawn: JLB	Dwg. No. 1 of 2
Checked: DGR	



NOTES:
1. PANELS VIEWED FROM WET SIDE.

PANEL 1
POOL PUMP RM
QTY = 1

Approx. Panel Weight = 74 lb



NOTES:
1. PANELS VIEWED FROM WET SIDE.

PANEL 2
ELECTRICAL RM
QTY = 1

Approx. Total Weight = 143 lb
Approx. Panel Weight = 71.5 lb

FRA SHOP DRAWING REVIEW
☐ APPROVED
☐ APPROVED AS NOTED (RESUBMITTAL NOT REQUIRED)
☐ APPROVED AS NOTED, RESUBMITTAL REQUIRED
☐ REJECTED, RESUBMITTAL REQUIRED

KINGSTONE BREWHOUSE POOL PUMP ROOM
MYRTLE BEACH, SC

FLOOD RISK AMERICA

720 LUCERNE AVENUE
LAKE WORTH, FLORIDA 33460
561-579-4230 www.floodriskamerica.com

Revisions:

Date	Description

Date: 7-19-22	FRA Proj. No: 24222
Scale: AS NOTED	
Drawn: JLR	Dwg. No: 2 of 2
Checked: DMB	