

Floodplain Design, Construction, & Impacts on Flood Insurance

AIA COURSE: SV0004
AIA CREDIT: 1 HSW
AIA PROVIDER: T058

PRESENTER: Robert Lemley, CFM
This presentation may be recorded for future use.

Presenter Information



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Send plans to:
PLANS@floodproofing.com

Who We Are

- **Smart Vent Products** began as an Engineered Flood Vent Manufacturer 20+ years ago
 - 750,000+ vents and 150 million+ sq. ft. protected
- **Risk Reduction Plus Group** is an insurance brokerage developed to further help clients reduce flood insurance premiums
 - Complimentary Flood Risk Evaluation services
- **Floodproofing.com** was created to provide Dry Floodproofing Solutions for non-residential buildings
 - Active & Passive Flood Barriers, Shields, and Windows
 - Partnered with FENEX to develop and bring to market Floodproof Windows tested to ANSI 2510
- **Flood Design Team** works with architects to specify in compliant and optimal floodproofing solutions
 - 750 Projects with Specification Assessments or Product Takeoffs in 2020



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AIA COURSE TITLE:	FLOODPLAIN DESIGN, CONSTRUCTION, AND IMPACTS ON FLOOD INSURANCE
AIA COURSE NUMBER:	SV0004
AIA CREDIT:	1 HSW
AIA PROVIDER:	FLOODPROOFING.COM
AIA PROVIDER NUMBER:	T058

CFM

ASFPM
EDUCATION
PROVIDER

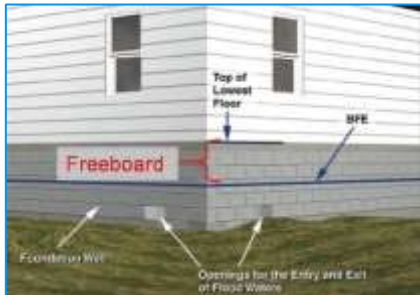
Learning Objectives



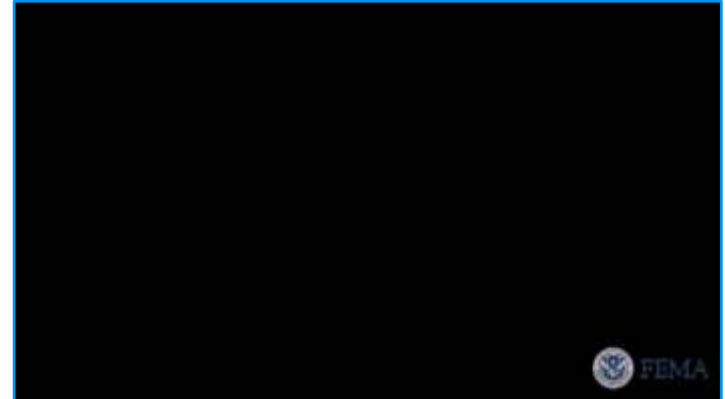
- Describe floods, floodplains, and the potential hazards to buildings.
- Explain the differences between wet and dry floodproofing techniques.
- Identify regulations, codes, and standards as they relate to sustaining foundations and overall business continuity in flood hazard areas.
- Define the differences in engineered and non-engineered flood openings and their ability to ensure resilient structures.
- Active vs. passive floodproofing solutions and the overall impact of ownership.
- Analyze the role of building compliance in securing lowering flood insurance rates and what mitigation solutions are available.

Basic Terms

- **Base Flood Elevation (BFE)** is the calculated level that flood waters will rise to during a Base Flood.
- **Design Flood Elevation (DFE)** is the elevation of the highest flood (generally the BFE including freeboard). Also, referred to as Flood Protection Elevation.
- **Special Flood Hazard Area (SFHA)**
 - **A zones** have low impact from waves.
 - **Coastal A zones** are expected to receive 1.5-foot or greater breaking waves.
 - **V zones** have high impact from waves.
- Both A and V zones subject to experiencing a 1% annual chance flood event. This translates to a 26% chance of flooding over the life of a 30-year mortgage.



Freeboard: Elevating a building's lowest floor above and beyond BFE. This is a built-in safety factor resulting in lower flood insurance premiums. Freeboard ordinance regulations are popular in CRS communities.



Different Types of Flood Risk

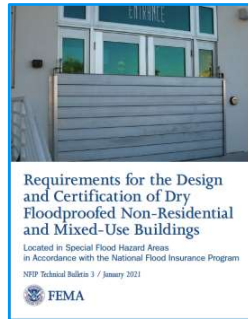


Hurricane Harvey – Pluvial Flooding

Floodplain Construction Regulations



- **ASCE 24-14 is the standard to follow**, IRC and IBC reference back to these requirements.
- FEMA TB-1 has all details for flood vents and wet floodproofing.
- FEMA TB-2 provides information regarding flood resistant materials to use.
- FEMA TB-3 for flood barriers and dry floodproofing.
- Local Floodplain Ordinances.

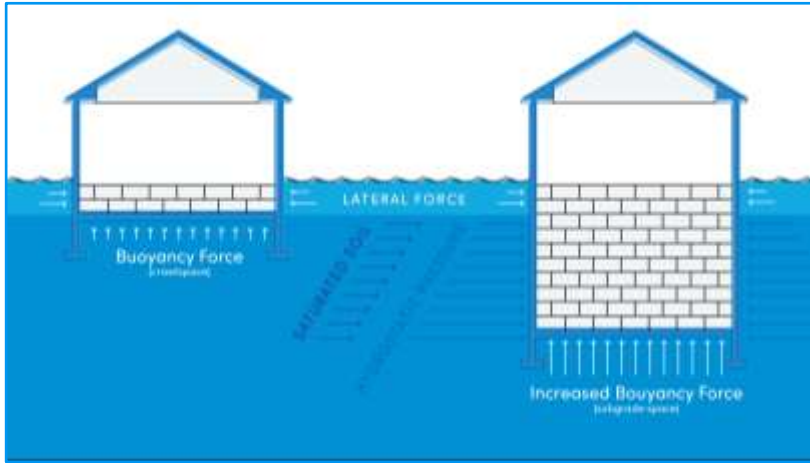




Wet Floodproofing Methods



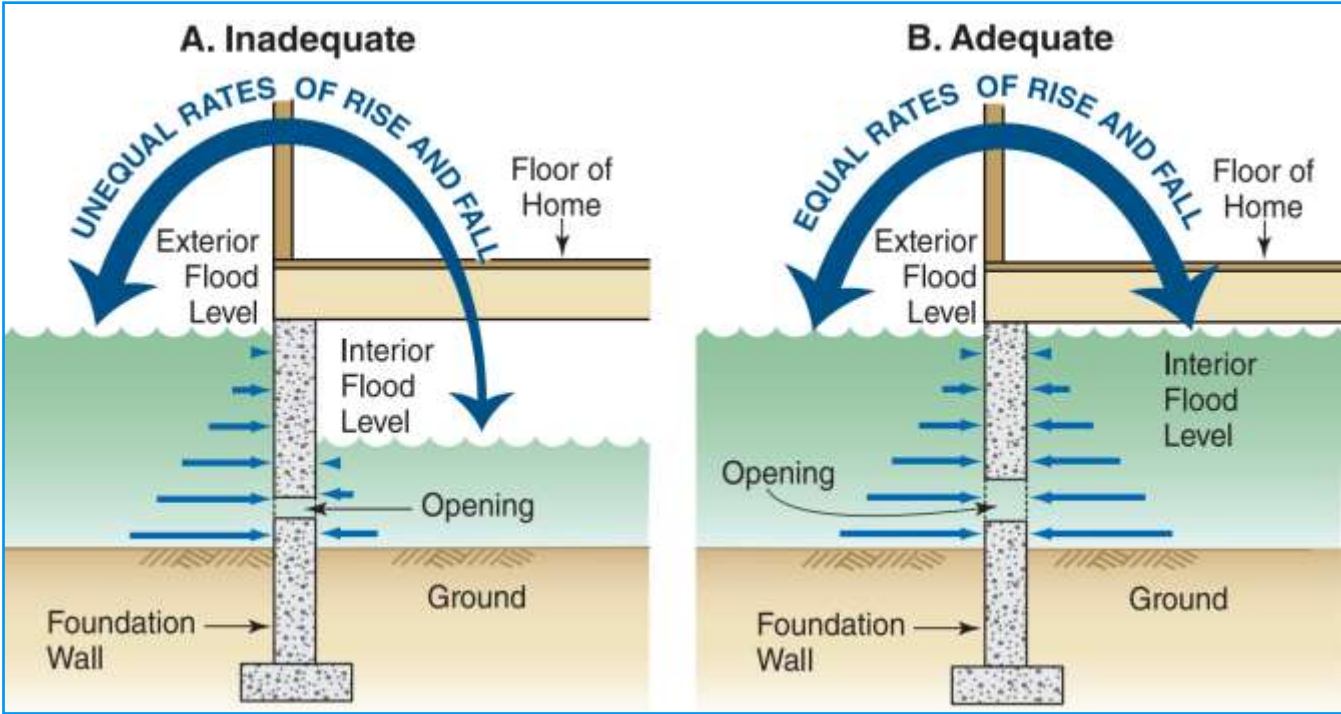
Lateral and Vertical Hydrostatic and Hydrodynamic Forces



Hurricane Sandy - Seaside Heights, NJ



Purpose of a Flood Vent



Types of Enclosures Below Base Flood Elevation



Crawlspace



Full-height enclosures
and garages



Spaces used for parking,
storage, building access



No living or finished space.

Residential buildings are required to elevate finished first floors and wet floodproof these below enclosures.

Commercial buildings have the option to wet floodproof, dry floodproof, or do a combination.

Mixed-use buildings have the option to wet floodproof or dry floodproof the lower commercial space floor (residential occupants above must have clear egress exit route; typically wet floodproofed).

Types of Flood Openings

Non-Engineered Openings



Engineered Openings (ICC-ES Certified)



“Flood openings **without moving parts** are **non-engineered openings**, while those **with moving parts** should be certified as **engineered openings**.” FEMA TB-1

Flood Vent Basics

Flood Vents Must:

- **Relieve** hydrostatic pressure on foundation walls during a flood event.
- **Automatically allow entry and exit of flood waters** (i.e., free inflow and outflow in both directions) to equalize the hydrostatic flood loads.
- **Passively Equalize – (without human intervention)** hydrostatic loads on enclosure walls below the DFE.
- **Bi-Directionally** relieve flood waters regardless of the direction of flow.



Non-Engineered Openings

- “Not designed” flood openings.
- **Come equipped with obstructions** to flow as there is a minimum screen requirement per code.
- **Must account for obstructions to flow.** Deducts from the coverage area calculation.
- **Must adhere to the 1 sq. in. of NET open area for every 1 sq. ft. of enclosed area rule.**

A 16-in. x 8-in. hole with air vent device inserted does NOT provide 128 sq. in. of open area.

- **Liability rests with design professional, contractor, surveyor, construction official specifying and allowing a product for it's unintended use.**



ASCE 24-14 Standards Further Clarify

Table 2-2 Flood Opening Coefficient of Discharge^a

Opening Shape and Condition	c
All shapes, partially obstructed during design flood ^b	0.20
Circular, unobstructed during design flood	0.60
Rectangular, long axis horizontal, short axis vertical, unobstructed during design flood	0.40 ^c
Square, unobstructed during design flood	0.35
Rectangular, short axis horizontal, long axis vertical, unobstructed during design flood	0.25 ^d
Other shapes, unobstructed during design flood	0.30

^a Different coefficients of discharge shall be permitted: (1) where a designer has performed detailed, opening-specific calculations, a coefficient of discharge up to 10% different than given in Table 2-2 shall be permitted; or (2) where laboratory testing or numerical modeling of flow through the opening has been conducted, the resulting coefficient of discharge shall be permitted. In no case shall a coefficient of discharge > 0.60 be permitted.

^b Openings shall be classified as partially obstructed if louvers, blades, screens, grilles, faceplates, or other covers or devices are present during the design flood.

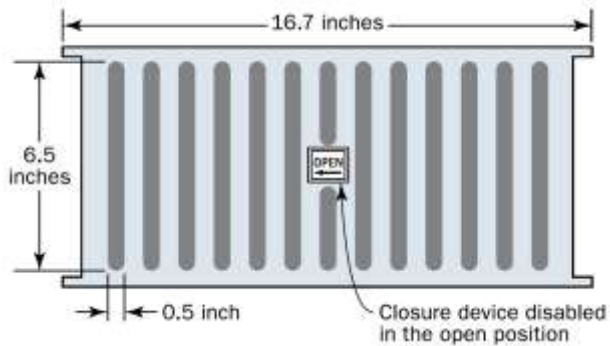
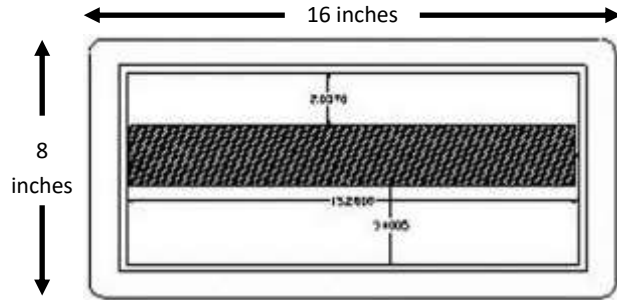
^c When the horizontal dimension is twice or more the vertical dimension, use 0.4; as the dimensions approach a square, interpolate from 0.4 to 0.35.

^d When the horizontal dimension is half or less the vertical dimension, use 0.25; as the dimensions approach a square, interpolate from 0.25 to 0.35.

- This covering and other louvers, blades, grilles and faceplates put air vents into a partially obstructed category which carries a coefficient of discharge of 0.20.
- Using 0.20 in the calculations yields A = 0.83 sq. in. for every 1 sq. ft. of area which is rounded to 1 sq. in. of net open area for every 1 sq. ft. of enclosed space.



Engineered Flood Vent vs. Non-Engineered



- Example of an Engineered Flood Vent:
(shown with flood door in the open position)

It has **200 sq. ft. of rated flood protection.**



- Example of a Non-Engineered Opening:

It has **42 sq. in. net open area,** if *permanently disabled* in the open position.

The Math on Non-Engineered Openings



- Footprint of 30 ft. x 40 ft. = 1,200 sq. ft.
- $1,200 \text{ (sq. ft.)} / 42 =$
29 total non-engineered vents required
- About 1 opening every 3 CMU block

If certain Engineered Flood Vents are used:

$$1,200 \text{ (sq. ft.)} / 200 =$$

6 total engineered flood vents required



Debris is a Fact of Flood: Issues with Non-Engineered Openings

AREAS LIKELY TO HAVE DEBRIS AND SEDIMENT

Section C2.7.2.1 of the ASCE 24 commentary suggests using caution in selecting or specifying openings with louvers, blades, screens, or faceplates that may be blocked by debris and sediment. In areas where experience indicates that floodborne debris and sediment are likely, ASCE 24 recommends avoiding the use of openings with components that have been shown to become blocked or clogged.

“Where experience has shown that a particular type of opening has been blocked or clogged by flood debris or sediment, FMO will not accept that type of flood opening.”

*Houston City Code for Floodplain
Chapter 19 pg. 52*

ASCE 24 recommends AVOIDING these types of openings.

These air vents will be REJECTED as flood openings by Houston FMO



ICC-ES Engineered Openings



DUAL-FUNCTION
MODELS



INSULATED
MODELS



Pour-in-Place Buck
Models



Wood Wall
Models



Garage Door
Models



Multi-Frame
Configuration Models

- Designed, tested, & certified for performance
- Designed and certified based on computations (TB1 and ASCE 24)
- ICC-ES Certified: AC-308 (MOFV)
- 3-inch min. dimension for debris flow
- 316 Stainless Steel, Powder Coat Paint Options



Mechanically Operated Passive Flood Relief

- A performing Engineered Opening mechanically operates, automatically activated to **reveal an unobstructed opening** during design flood with a minimum unobstructed opening of 3-inch.
- Because a rodent screen is required by ICC code for any under floor opening, it requires a Engineered Opening to go from a obstructed opening to a unobstructed opening when activated.



Flood door closed, obstructing the opening.



Flood door activated, reveals an unobstructed opening.





AC-364

Mechanically Operated Flood Vents




Performance Testing

Sample ICC-ES Certification Report

- All products certified through the ICC-ES will be clearly identified in the field with a label with the model number and certified coverage.
- Liability for performance rests on the manufacturer's shoulders.
- Vents are tested.
- Flood Vents have regular quality control inspections – unannounced.





Must Not Be Altered or Tampered

ICC-ES Evaluation Report

ESR-2074

Released February 2017

This report is subject to revision February 2018

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DEVISION: 09 08 00—OPENINGS
Section: 09 08 43—Vents/Transoms/Flood Vents

REPORT HOLDER:

EVALUATION SUBJECT:

SMART VENT® AUTOMATIC FOUNDATION FLOOD VENTS
MODELS #1540-02, #1540-02L, #1540-01L, #1540-01, #1540-01L, #1540-01A, #1540-01C, #1540-01D, #1540-01E

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009 and 2006 International Building Code (IBC)
- 2015, 2012, 2009 and 2006 International Residential Code® (IRC)
- 2013 Abu Dhabi International Building Code (ADIBC)

*The ADIBC is based on the 2006 IBC, 2003 IBC, code systems referenced in this report per the same section codes (16.02).

Properties evaluated:

- Physical operation
- Water flow

2.0 USES

The Smart Vent® units are engineered mechanically operated flood vents (FV) designed to regulate hydrostatic pressure on walls of enclosures subject to rising or falling flood waters. Certain models also allow natural ventilation.

3.0 DESCRIPTION

3.1 GENERAL

When subjected to rising water, the Smart Vent® FVs internal floats are activated, their shut open to allow flow in either direction so ventilation water level and hydrostatic pressure from one side of the foundation is the other. The FV opening door is normally held in the closed position to a buoyant release device. When subjected to rising water, the buoyant release device causes the unit to unlatch, allowing the door to rotate out of the way and allow flow.

The water level stabilizes, equalizing the lateral forces. Each unit is fabricated from stainless steel Smart Vent® Automatic Foundation Flood Vents are available in various models and sizes as described in Table 1. The SmartVENT® Floating Model #1540-011 and FloodVENT® Floating Model #1540-021 units each contain two vertically arranged openings per unit.

3.2 Engineering Overlay:

The FVs comply with the design principle noted in Section 2.7.2.2 and Section 2.7.3 of AISC360 16-14 [Section 2.6.3.2 of AISC360 16-10 (2012, 2009, 2006 IBC) and IBC] for a maximum size of 16 in. (413 mm) and 1/2 in. (12.7 mm) per face (0.423 mm) in order to comply with the engineering opening requirement of AISC360 16-14. Smart Vent FVs must be installed in accordance with Section 4.0.

3.3 Ventilation:

The SmartVENT® Model #1540-010 and SmartVENT® Floating Door Model #1540-014 both have screen covers with 1/4-inch-by-1/4-inch (6.35 by 6.35 mm) openings, yielding 81 square inches (5200 mm²) of net free area to supply natural ventilation. The SmartVENT® Floating Model #1540-011 consists of two Model #1540-010 units in one assembly, and provides 162 square inches (10400 mm²) of net free area to supply natural ventilation. Other FVs recognized in this report do not offer natural ventilation.

4.0 DESIGN AND INSTALLATION

SmartVENT® and FloodVENT® are designed to be installed into walls or overhead doors of existing or new construction from the exterior side. Installation of the vents must be in accordance with the manufacturer's instructions, the applicable code and the report. Installer steps allow retaining in masonry and concrete walls of any thickness, in order to comply with the engineering opening design principle noted in Sections 2.7.2.2 and 2.7.3 of AISC360 16-14 [Section 2.6.3.2 of AISC360 16-10 (2012, 2009, 2006 IBC) and IBC]. The Smart Vent® FVs must be installed as follows:

- With a minimum of two openings on different sides of each enclosed area.
- With a minimum of one FV for every 200 square feet (18.6 m²) of enclosed area, except that the SmartVENT® Floating Model #1540-011 and FloodVENT® Floating Model #1540-021 must be installed with a minimum of one FV for every 400 square feet (37.2 m²) of enclosed area.
- Below the base flood elevation.

ICC-ES Evaluation Reports provide an impartial, non-representative verification and/or certification of product quality attributes, and are not to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, expressed or implied, in any listing or other matter of this report or in any product referred to in this report.

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ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1–9.

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade

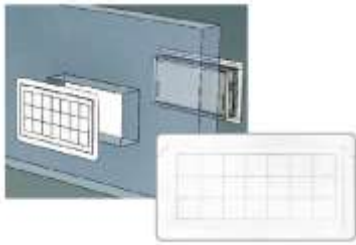
c) Total net area of flood openings in A8.b sq in

d) Engineered flood openings? Yes No

Flood Vent Sealing Kits, Trim & Sleeve Kits, Fire Dampers



Pictured: Foyer application meets 2018 Energy Codes



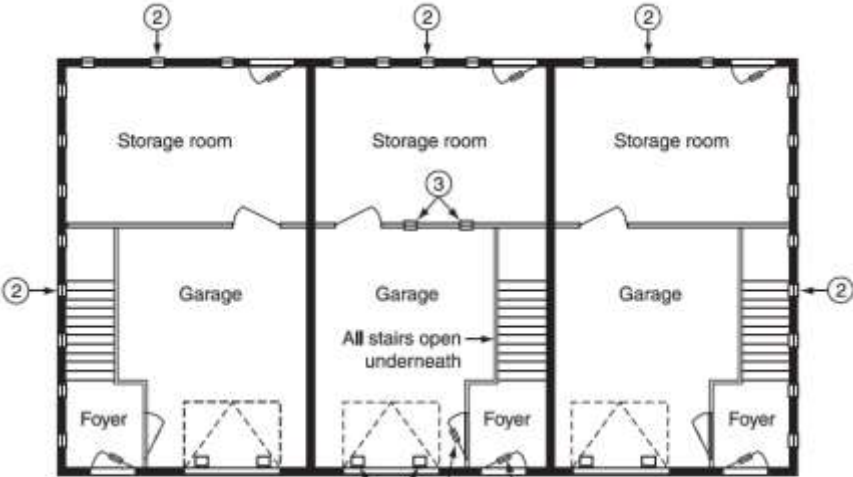
Trim & Sleeve Kits



Fire Dampers

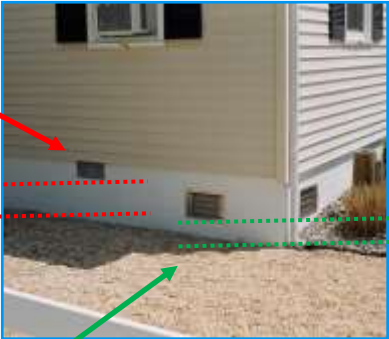


Placement: Coverage, Two Exterior Walls, Height, Below BFE



- ① Openings in garage door
- ② Openings in exterior wall
- ③ Openings in interior wall/door
- ④ Openings in exterior door

More than 12"



Within 12"



Before

CASE STUDY

Actuarial Rate

\$9,000+ Premium

Subsidized Rate

\$2,038 Premium



BFE 460'

-9 NFIP RATING
Bottom Floor 450.93'

NO FLOOD VENTS

After

CASE STUDY

+1 NFIP RATING
Higher Floor 460.69'

BFE 460'



NEW RATING AFTER INSTALLATION OF FLOOD VENTS

NFIP Flood Insurance Premium Results

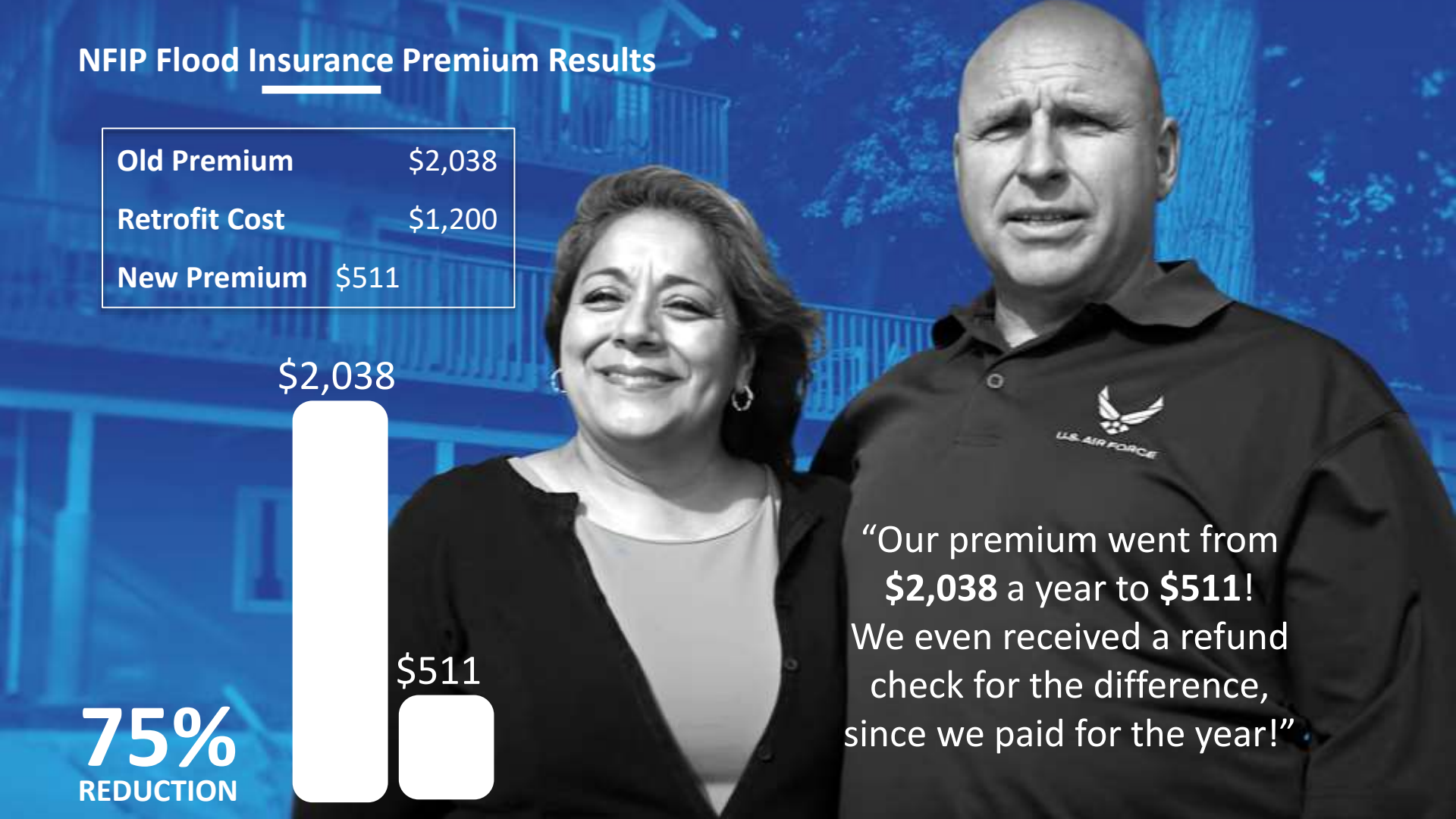
Old Premium	\$2,038
Retrofit Cost	\$1,200
New Premium	\$511

\$2,038

\$511

75%
REDUCTION

“Our premium went from **\$2,038** a year to **\$511!** We even received a refund check for the difference, since we paid for the year!”

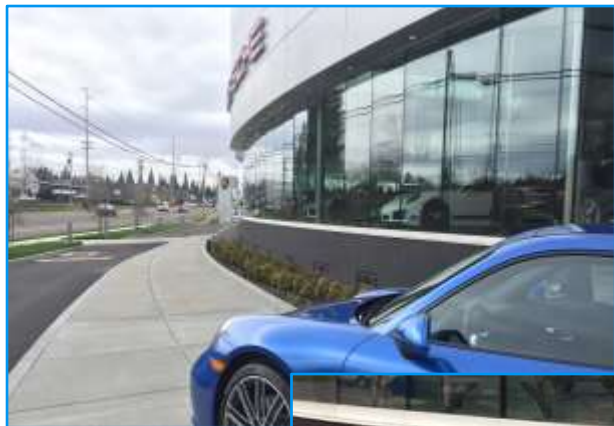




Commercial Wet Floodproofing



Case Study: Porsche Dealership in OR & Mercedes Benz in NJ



2x2 Multi-Frame
800 sq. ft. of
flood protection each



6x2 Multi-Frame
2,400 sq. ft. of
flood protection each

Case Study: MUSC in Charleston, SC



Medical University of South Carolina

James E. Clyburn Research Center

Custom Multi-Frames

Nineteen 4 x 3 frames provided 2,400 sq. ft. each

One 3 x 3 frame provided 1,800 sq. ft. each



Total Flood Coverage:
47,400 sq. ft.

Case Study: Credit Island Lodge in IA





Dry Floodproofing Methods

Standard Perimeter Flood Barriers: Rigid, Portable



FLOOD CONTROL



CONTAINMENT



STORMWATER
MANAGEMENT



ROAD CROSSING

- One 4-foot section replaces **468 sand bags**.
- Unlike sand bags, can be installed during the flooding event.
- Sustainable, reusable, and reliable.
- Can be deployed quickly and safely when time is low.
- Stackable for use and storage.
- Tongue and groove panel interface for easy connections.
- Connections allow for 11-degree flexibility in either direction.
- Corner pieces allow for 90-degree turns.
- All-season compatibility.



468 SANDBAGS REPLACED BY



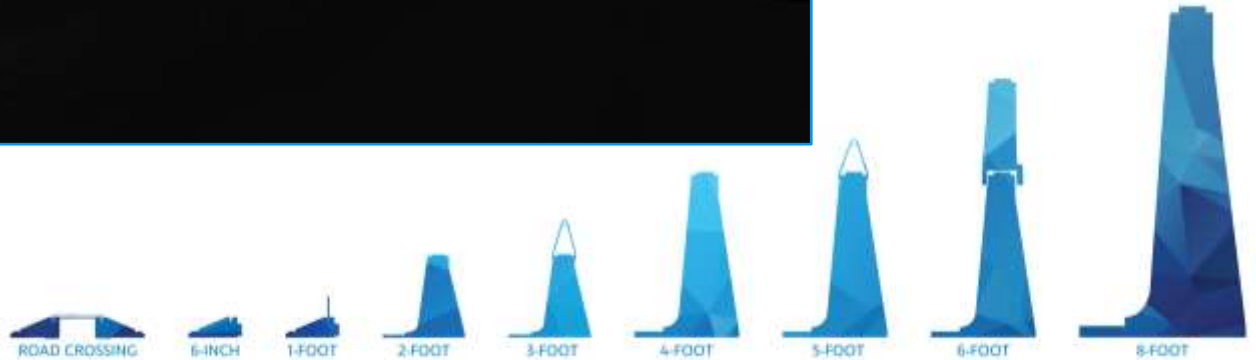
Standard Perimeter Flood Barriers: Rigid, Portable



"We were able to set up 200 feet of barriers with three people in less than 45 minutes."
Larry Bowler, Operation Manager of Sandy City Utilities



Solutions for terminating against a wall



California Department of Water Resources Flood-Fighting Specialists being trained on how to most effectively deploy on a levee.

Standard Perimeter Flood Barriers: Rigid, Portable



- Solution for existing buildings that aren't being substantially improved.
- Temporary solution while renovation work is being completed.
- Stormwater Management & Erosion Control.
- Environmental and containment applications.
- Golf course and agricultural applications.



Custom Perimeter Flood Barriers: Flexible, Portable



- One person can unroll the barrier and deploy in minutes
- Attach multiple pieces together as needed with a double waterproof zipper connection
- Applications – Protection for Commercial, Residential, Transit, Farmland, Livestock
- No stitching. All High Frequency welding; Corners options are available
- Materials – Coated PVC Fabric, Fiberglass Batons & Rods, Stainless Steel Cables
- Weight – 0.75 lbs. per sq. ft.
- Available in 3, 4, 5, 6 ft. heights

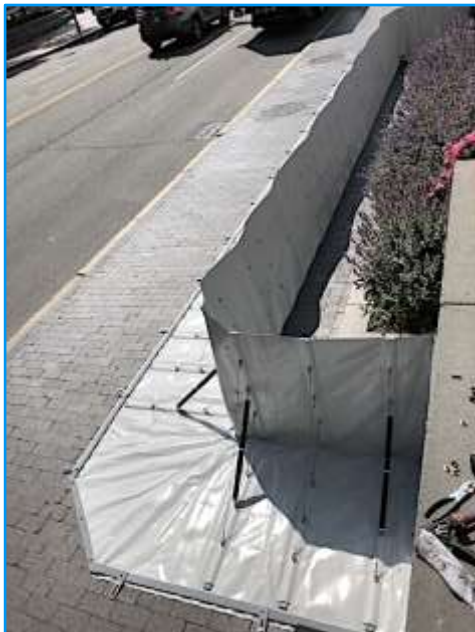


Waterproof Zipper Connection



Section Lengths Transport Easily

Custom Perimeter Flood Barriers: Flexible, Portable



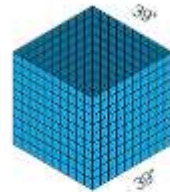
Custom Perimeter Flood Barriers: Flexible, Portable



Collapsible Perimeter Flood Barriers: Compact Storage, Portable



- Quick & efficient deployment and retraction
- Pin multiple 16.4 ft. sections together as needed
- 28 in. protection height
- Durable multi-layer polymeric reservoir, military grade steel frame
- Fill with any available water source



ONE RESERVOIR SHOWN



COMPACT – 100 LINEAR FT. CAN FIT IN A PICKUP TRUCK

Collapsible Perimeter Flood Barriers: Compact Storage, Portable

QUICK, 4 STEP DEPLOYMENT



1

Unfold cage on top of liner



2

Line cages with reservoirs



3

Fill using an available water source



4

Pull liner over barrier

Pumps for Floodproofing Designs

- Required for any dry floodproofed design
- Special consideration for perimeter flood barrier systems
- Float switches, wheel kits, remote monitoring & operation available
- Diesel driven permanent installation models
- FM Approved models for large areas

ASCE 24-14 (Section C6.2 pg. 61)

Sump pumps should be provided to handle inevitable seepage, and emergency power should be provided to run the pumps, especially in areas where inundation duration is expected to last more than 12h.



Electric
Submersible Pumps



Gasoline Driven
Wet-Prime Pumps



Gasoline Driven
Dri-Prime Pumps



Inside Installation



Permanent Installation

FEMA Technical Bulletin 3 / January 2021



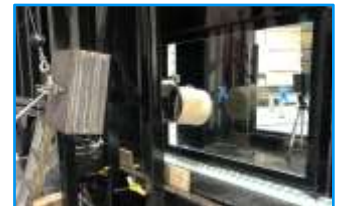
Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings

Located in Special Flood Hazard Areas
in Accordance with the National Flood Insurance Program

NFIP Technical Bulletin 3 / January 2021



- Goal to make a building watertight, impermeable to floodwaters.
- NFIP allows dry floodproofing in **non-residential buildings only**.
- For new construction or substantial improvements to existing buildings. Acceptable in A, AE, A1-A30, AO, & AH Zones.
- Design must be certified.
- Page 26 – “ASCE 7 should be used as the source of how to calculate debris impact loads..” Dry floodproofing solutions should withstand impacts from a minimum weight of 1,000 lbs.
- ASCE 7, Section 6.11 requires designs to include the effects of debris impact forces in flood load calculations when the minimum inundation depth is 3 ft. or greater.

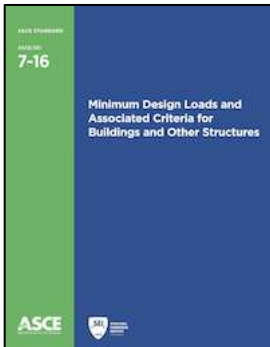


ASCE 24 & 7, International Building Code (IBC)

ASCE 24-14



ASCE 7-16



1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*:

1. For construction in *flood hazard areas* not subject to high-velocity wave action:

1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3.

1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1 of ASCE 24, *construction documents* shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24.

1.3. For dry floodproofed nonresidential buildings, *construction documents* shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.

2. For construction in flood hazard areas subject to high-velocity wave action:

2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3.

2.2. *Construction documents* shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored

- IBC points to ASCE 24 for requirements
- ASCE-24 Dry Floodproofing Sections: 6.2.1, 6.2.2, 6.2.3

ASCE-24 Dry Floodproofing is a combination of measures that results in a structure, including the attendant utilities and equipment, **being watertight with all elements substantially impermeable and with structural components having the capacity to resist flood loads.**

Substantially Impermeable means the maximum accumulation of 4 in. of water depth in such space during a period of 24 hours.

Periodic Drills & Deployment Time

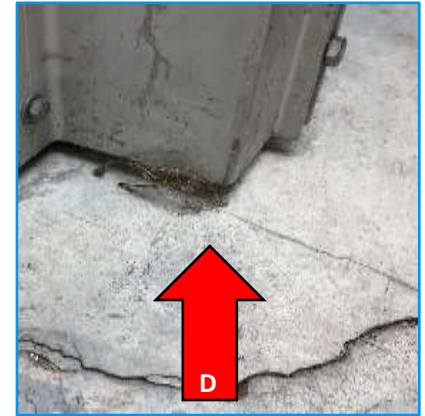
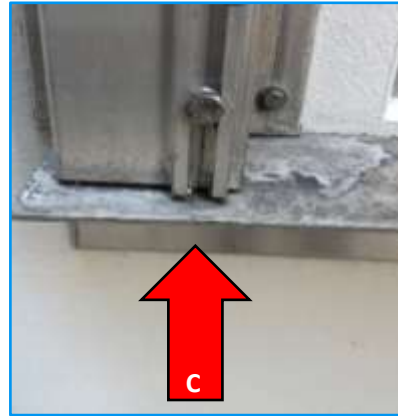
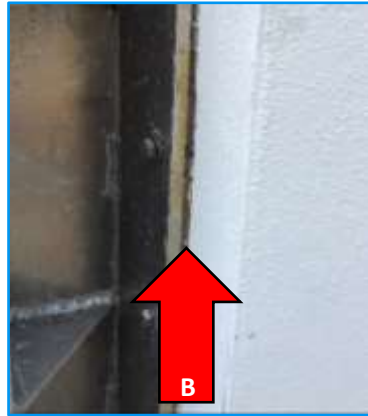
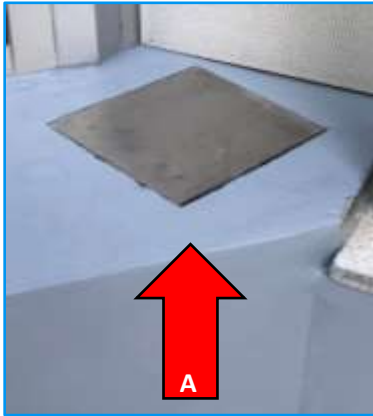
Periodic Drill and Training Program (Annually)

- ASCE 24-14 (Section 6.2.3 pg. 21)
- NFIP FLOOD INSURANCE MANUAL
APRIL 2020 (pg. 70)
- FEMA TB-3 (pg. 5)

Flood warning time to be a Minimum of 12 hours. Floodproofing measures should be installed within the warning time.

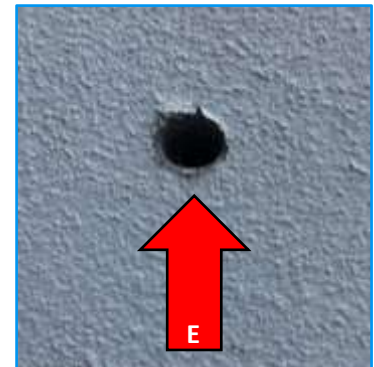
- ASCE 24-14 (Section 6.2.3 pg. 21)

Proper Installation is Critical: Specify Trained Installers



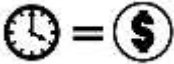
Issues:

- A. Cast in place post sleeve was not installed plum
- B. Wall bracket was left installed, gasket deteriorated in the Miami sun
- C. Gap between the wall bracket and sill
- D. Concrete leveler used, created uneven mounting surface and exposed gap. (Mouse Nest)
- E. Drop in anchor not installed with adhesive and fell out



Turn-Key Flood Protection Services

Using inexperienced installers for flood systems can lead to added costs, wasted time, and even faulty installations.



Turn-Key Flood Protection Services are available to architects and general contractors to get the job done right.



BIDDING

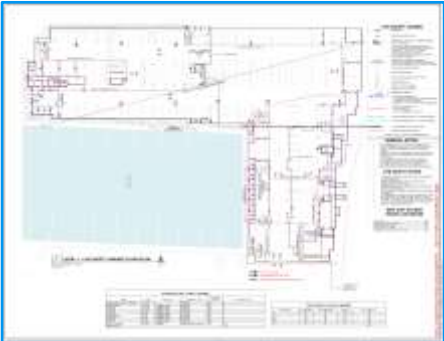
- Project Review and Design
- Accurate Takeoffs and Product Quotes
- Value Engineering
- Dry Floodproofing Certification

PRODUCTS

- Aluminum Flood Logs
- Flood Panels
- Perimeter Systems
- Engineered Flood Vents
- Passive Systems
- Floodproof Glass

INSTALL

- Product Specific Installation
- Complete Installation with Quick Turnarounds
- On-site Visits and Deployment Training
- O+M Manual and Emergency Management Plan



FLOODPROOFING TAKEOFFS

Item	Description	Quantity	Unit	Material	Notes
1	Aluminum Flood Log	100	Linear Feet	6061-T6	See drawing for details
2	Flood Panel	50	Sq. Ft.	1/2" Thick	See drawing for details
3	Perimeter System	200	Linear Feet	Aluminum	See drawing for details
4	Engineered Flood Vent	10	Sq. Ft.	Steel	See drawing for details
5	Passive System	150	Linear Feet	Aluminum	See drawing for details
6	Floodproof Glass	500	Sq. Ft.	Tempered	See drawing for details

Flood Logs

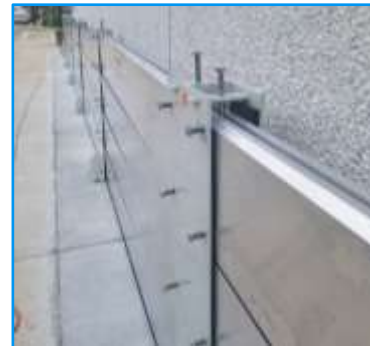
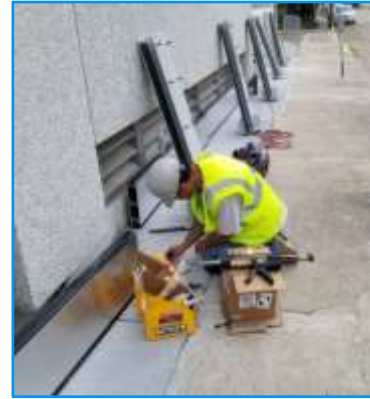


- Flood Logs can be installed either across specific openings or as a perimeter defense.
- Each application is engineered to suit its site specific conditions optimizing the system's effectiveness.
- Wall Mount, Offset Wall Mount, Jamb Mount, Corner Options available



Flood Logs: Installation at Court Annex in Houma, LA

- 7 openings at a height of 4 ft.
- Two 85 ft. arrays, jamb mount to outside channel
- Protecting louvers to basement mechanicals
- Concrete walls, modified concrete sills



Flood Plank Systems

Largest removable flood wall in USA



Holman Field, St. Paul Downtown Airport

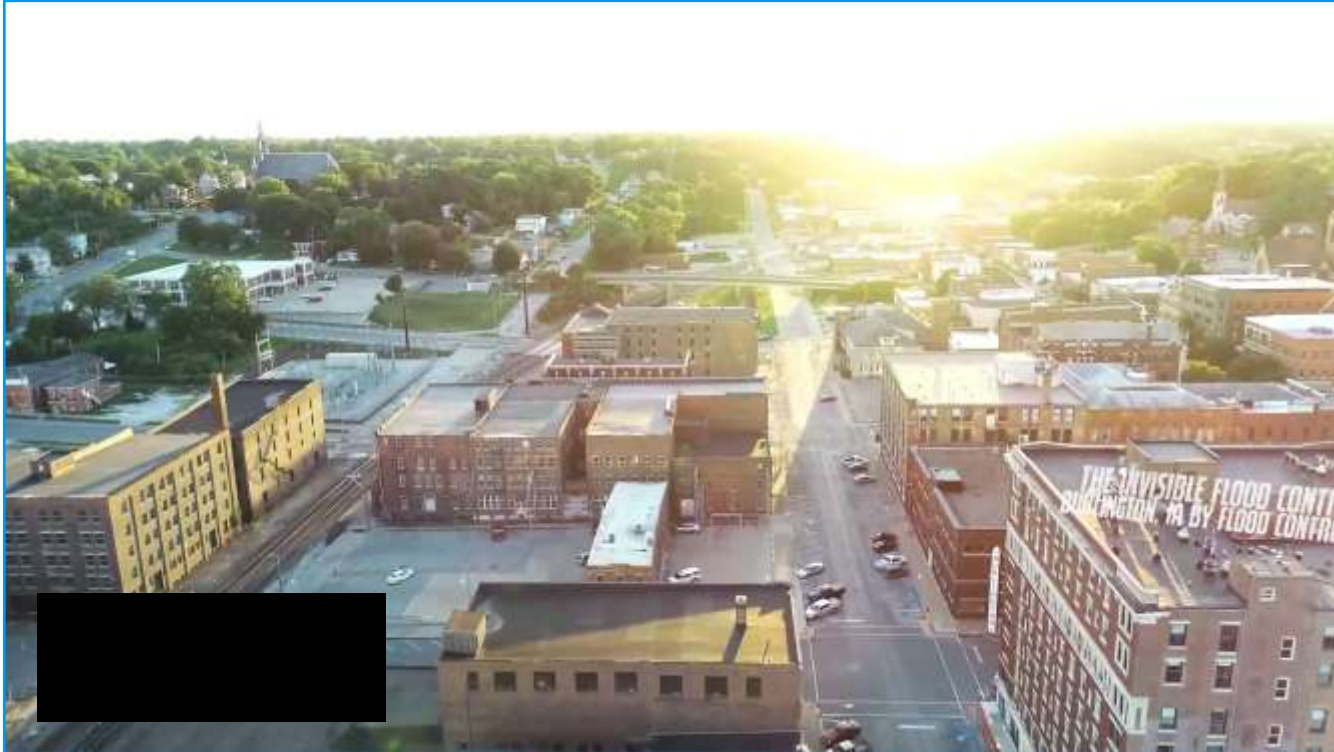


Waterfront Application

Angle Braces

MATERIAL	PLANK WEIGHT	PLANK LENGTH	SYSTEM HEIGHT
Galvanized Steel Posts, Aluminum Planks	5lb/ft	Max 20'	Max 20'

Flood Plank Systems



Custom Door & Window Flood Barriers



- Custom sizes available
- Lightweight (less than 5 pounds per sq. ft.)
- Easy to install and remove
- Fiber-reinforced plastic skin
- Decorative caps to cover anchors when not in use



Custom Door & Window Flood Barriers: Components

Spline Connections



Conforms to Uneven Surfaces



3/8" Fasteners

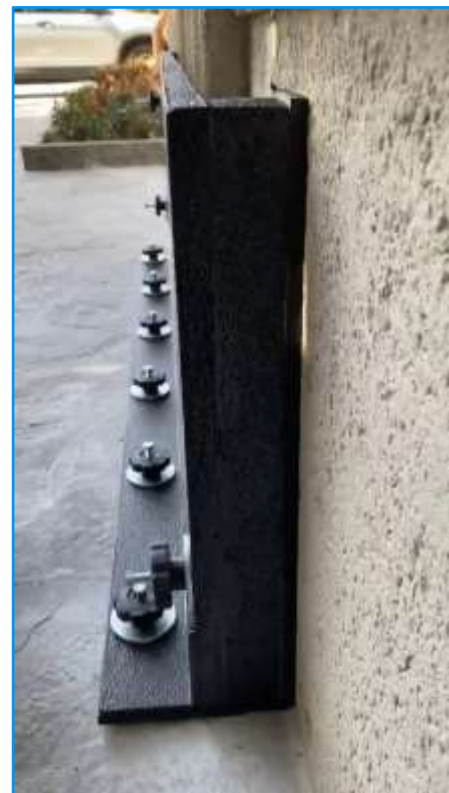


Decorative Caps
(paintable)

Custom Door & Window Flood Barriers: Installations & Deployment



Toolless Deployment



Standard Door Flood Barriers



- High strength, “water-tight”, deployable barrier.
- Hydrostatic; High-impact; Low Leakage: ANSI/FM 2510 Approved
- Comprised of aluminum structural frame, structural impact resistant webbings, coated fabric water barrier, outer fabric impact cover.
- No bottom anchors
- Rapid Deployment & Removal: 1-2 people – 5-10 minutes
- Automatic Bottom Gasket Protection (while in storage)

2 ft. DFE



4 ft. DFE



6 ft. DFE



ANSI/FM 2510 American National Standard
for Flood Abatement Equipment for Openings

54" wide
for 48 in. Opening



92" wide
for 86 in. Opening

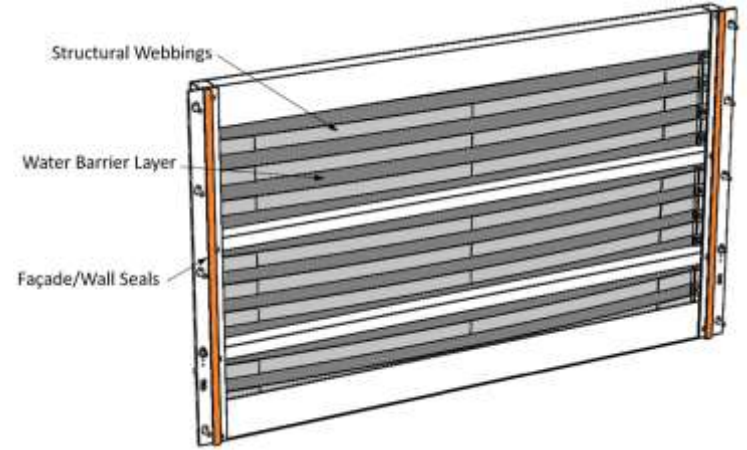


Standard Door Flood Barriers



Structural Webbing

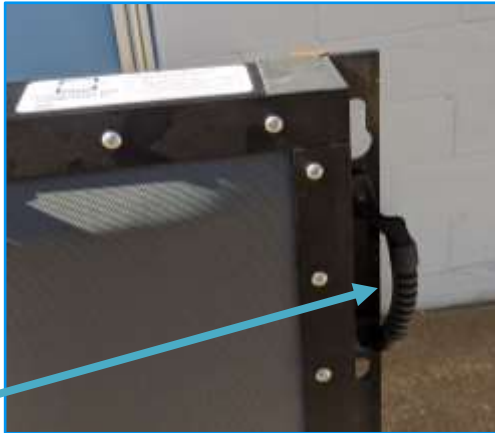
Bolt Storage Bag



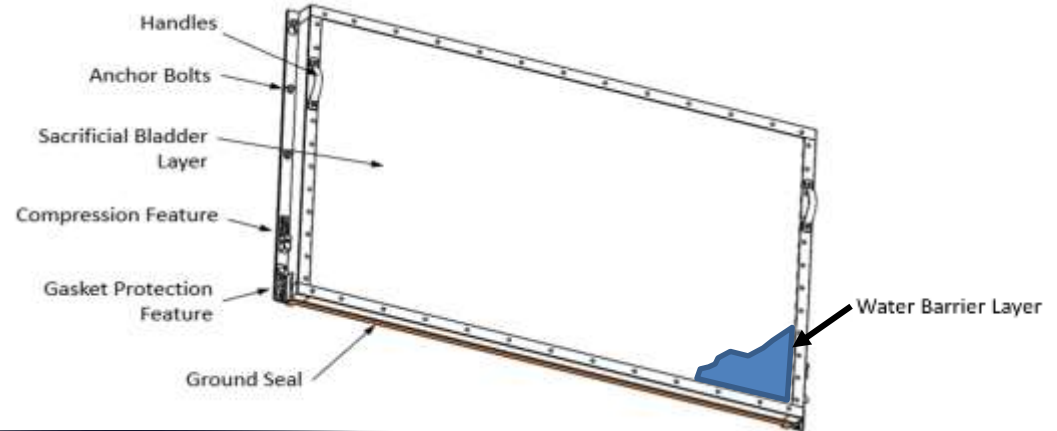
Structural Webbing

Water Barrier Layer

Façade/Wall Seals



Lifting Handle



Handles

Anchor Bolts

Sacrificial Bladder Layer

Compression Feature

Gasket Protection Feature

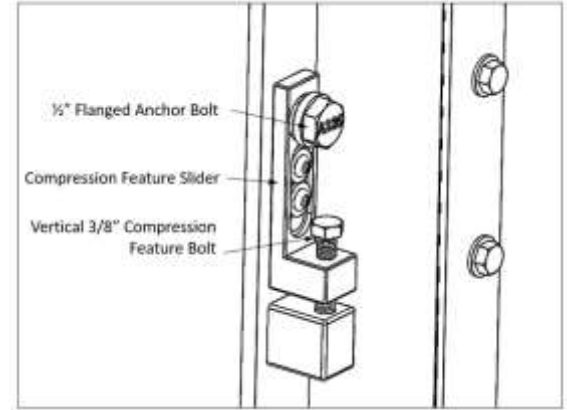
Ground Seal

Water Barrier Layer

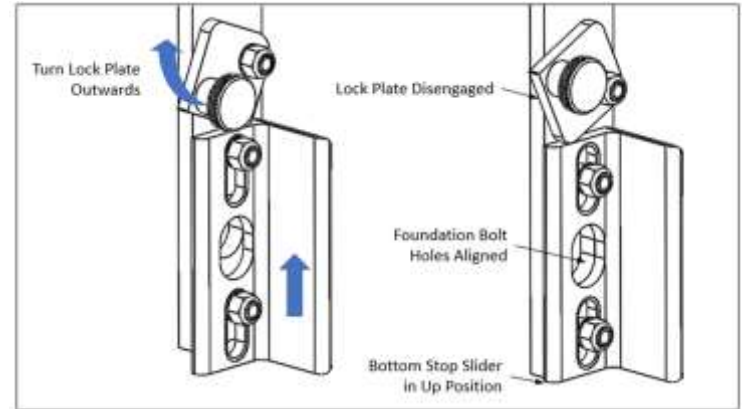
Standard Door Flood Barriers



Ground Gasket
Compression Feature



Bottom Gasket
Protection Feature

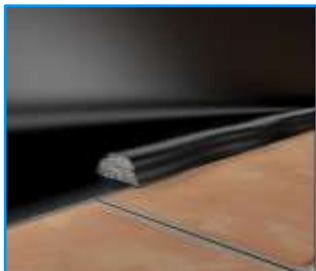


Point-of-Use Flood Barriers: Side-Deployed Flexible Wall



ANSI/FM 2510 American National Standard
for Flood Abatement Equipment for Openings

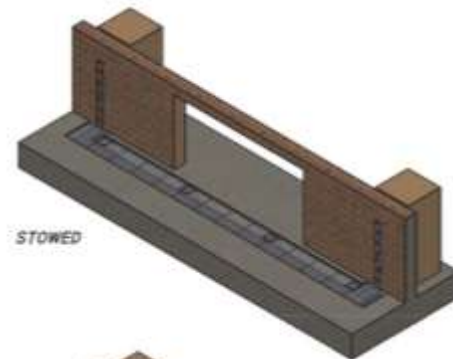
Point-of-Use Flood Barriers: Critical Facility Deployment



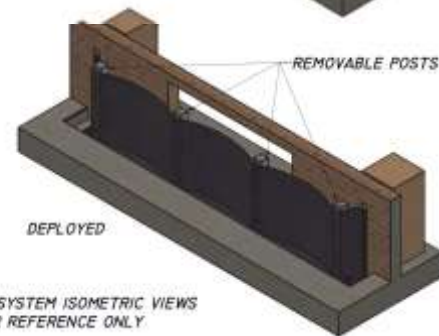
Point-of-Use Flood Barriers: Vertical-Deployed Flexible Wall



Example: 8-ft. length packed in an 8-in. x 8-in. space



STOWED



DEPLOYED

REMOVABLE POSTS

EXAMPLE SYSTEM ISOMETRIC VIEWS FOR REFERENCE ONLY

Passive Flood Barriers: Self-Activating Walls

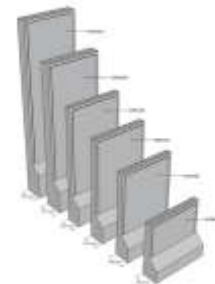
KEY BENEFITS

- Automatic spring support for fast activation
- Stainless steel and PTFE gaskets
- Delivered in one single unit
- No external power needed
- Low operational cost
- Always ready
- Easy manual lift, if desired



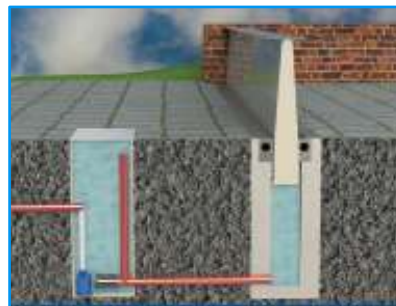
ANSI/FM 2510 American National Standard
for Flood Abatement Equipment for Openings

Passive Flood Barriers: Self-Activating Walls



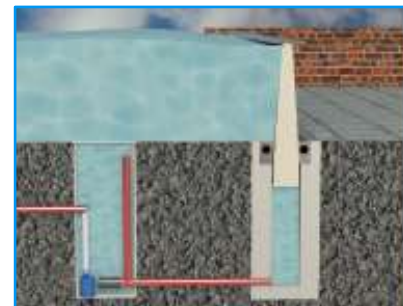
Resting Position

In non-flood conditions, all operational parts of the barrier are concealed in the underground basin.



Deploying

When floodwater rises to within a predetermined level below flood level, the basin housing the floating wall starts to fill up through an inlet pipe from the adjacent service pit.



Fully Deployed

The flood wall floats and rises. When the basin is totally filled, the angled support block will lock the barrier into position making it watertight.

Floodproof Windows



- **Passive flood barriers** that maintain your view and aesthetic
- Patented customizable frames designed to withstand impact & heavy loads
- Tested up to 10' of water
- Tested to ANSI 2510



Case Study: Whitehall Mill



- PROJECT LOCATION: Baltimore, MD
- TYPE: Passive Floodproof Windows
- FLOOD PROTECTION: 6'8" DFE
- SIZE: (14) 4'x6' flood windows with faux mullions
- INDUSTRY : Historic Repurposed Mill Turned Wedding Venue

Before Faux Mullions



FLOOD WALLS

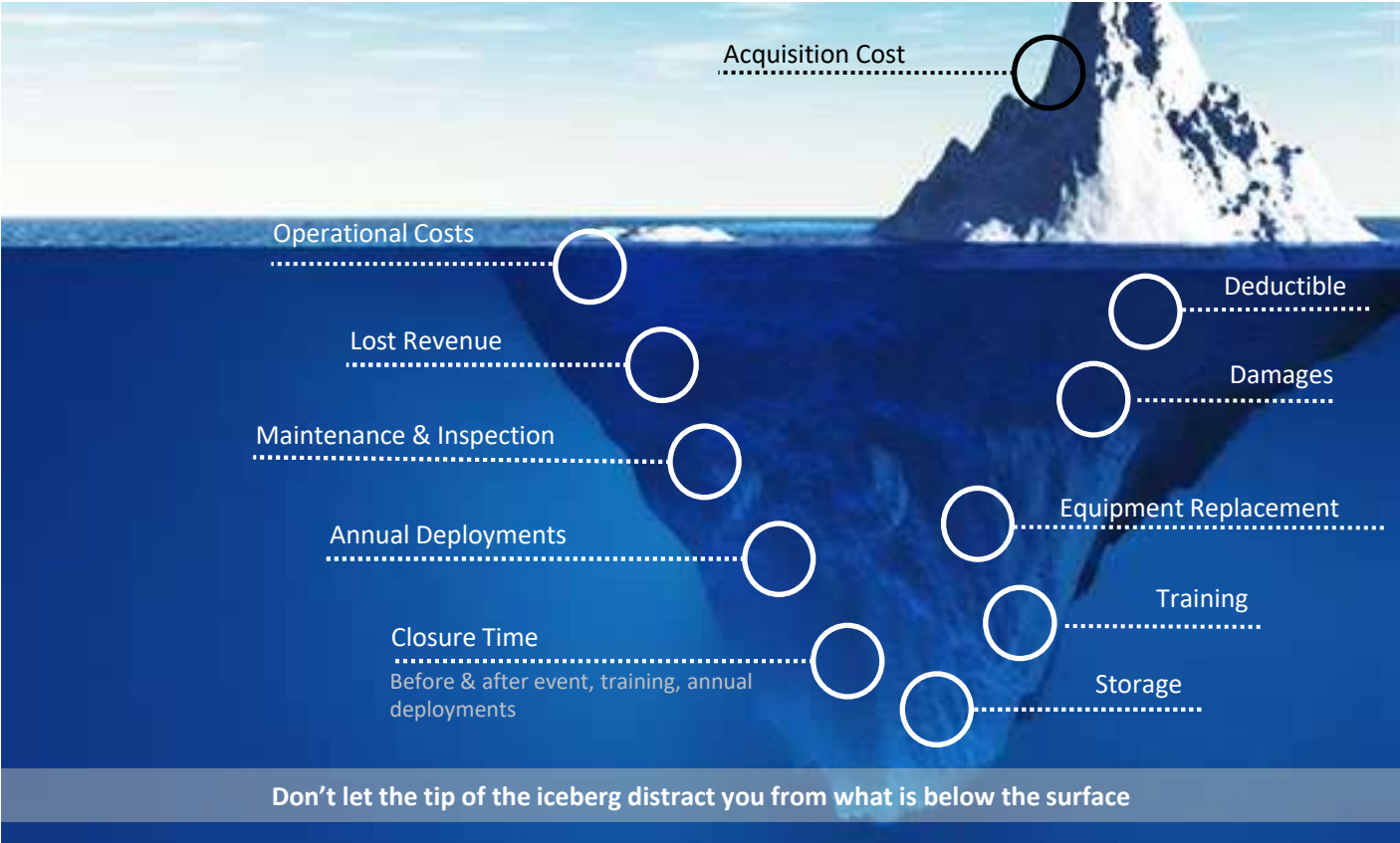
CONCEPTS TO INSPIRE

- A permanent, passive system. Always ready.
- Extremely resistant to coastal and environmental corrosion.
- Installation feasible on sea walls/bulk heads to avoid blocking the view.
- Resists up to 8-ft. of water with debris. 1,000 LB impact tested.
- Can be used as a railing in addition to a aesthetic pleasing flood wall solution by waterfront application.



Considerations for Floodproofing Strategy

TOTAL COST OF OWNERSHIP





Thank You For Your Time!



**GO TO www.floodproofing.com/education
TO RECEIVE AIA CONTINUING EDUCATION CREDITS &
COURSE CERTIFICATE**



AIA COURSE TITLE: FLOODPLAIN DESIGN, CONSTRUCTION,
AND IMPACTS ON FLOOD INSURANCE

AIA COURSE NUMBER: SV0004

AIA CREDIT: 1 HSW

AIA PROVIDER: FLOODPROOFING.COM

AIA PROVIDER NUMBER: T058

Robert Lemley, CFM
Certified Floodplain Manager
Flood Mitigation Specialist - TX

rlemley@floodproofing.com
c 832-992-8368



Send plans to:
PLANS@floodproofing.com

Communities Adopting Flood Re-inspections into Ordinance

Cape May, NJ Ordinance – Page 13

§ 199-6.

- A. The purpose of this section is to require an inspection of buildings, structures, or units prior to the transfer of title to determine compliance with City Code Section 258-17E (Flood Damage Prevention), but only with respect to the minimum number of flood vents.

Flood Vent inspections with every home sold in the SFHA can help to get pre-existing homes that do not meet current standards up to code.

At the time of a real estate transaction in Cape May, a flood vent inspection is triggered.

If the house fails, Cape May requires a retrofit into compliance.

More Communities Regulating X Zones to A Zone Standards

Ventnor, NJ Ordinance – Sec. 126-17

- (3) Require within any X Zone on the municipality's FIRM that all new construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated at or above the base flood elevation from the best available data, plus three feet. The base flood elevation shall be determined in accordance with §126-14B.
- B. Nonresidential construction. In an area of special flood hazard, all new construction and substantial improvement of any commercial, industrial or other nonresidential structure located in an A or AE Zone or X Zone shall either have the lowest floor, including basement, together with the attendant utilities and sanitary facilities as well as all electrical, heating, ventilating, air-conditioning and other service equipment:
- (1) Elevated to or above the base flood elevation (published FIS/FIRM), the best available flood hazard data elevation, or as required by ASCE/SEI 24-14, Table 2-1, whichever is more restrictive, plus three feet; and
 - (2) Require within any AO Zone on the municipality's effective FIRM that all new construction and substantial improvement of any commercial, industrial or other nonresidential structure shall have the lowest floor, including basement, elevated above the highest adjacent grade three feet above the depth number specified in feet or at or above the best available flood hazard data elevation plus two feet, whichever is more restrictive, and require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures; or
 - (3) Be floodproofed so that below the base flood level plus three feet, the best available flood hazard data elevation plus three feet, or as required by ASCE/SEI 24-14, Table 6-1 (whichever is more restrictive), or pursuant to §126-14B for structures in the X Zone, the structure is watertight with walls substantially impermeable to the passage of water;

Ventnor, NJ now regulates structures located in X Zones to be regulated as A zone standards, plus 3-ft.

Non-Conversion Agreement Ordinance Updates

The Property Owner acknowledges and agrees to the following:

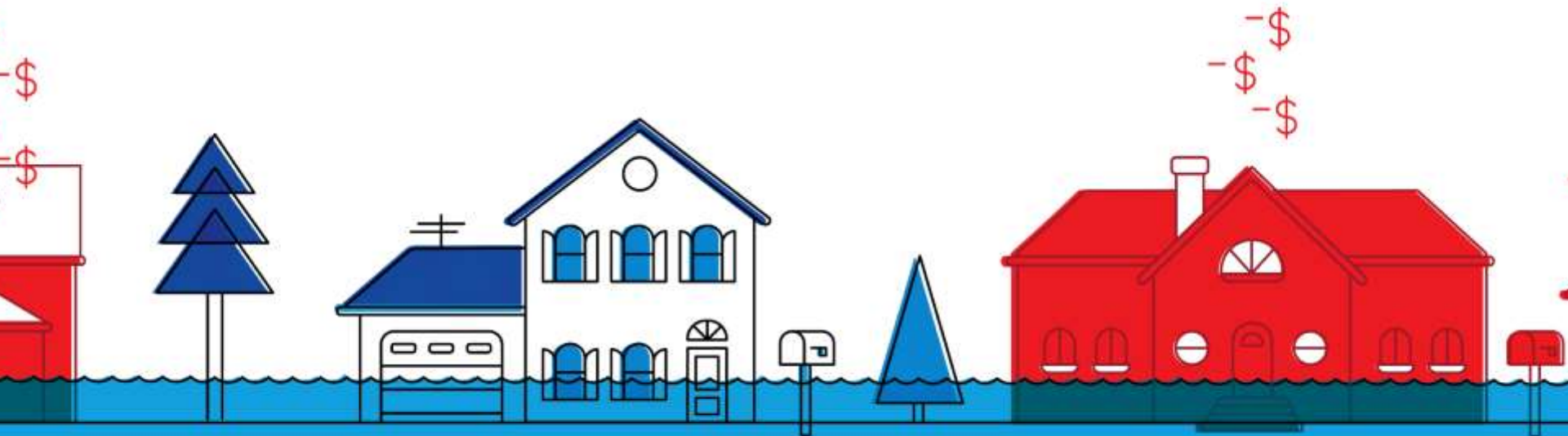
1. That s/he is a new owner of the above property,
2. That the enclosed area, if permitted, shall be used solely for parking of vehicles, limited storage, or access to the building and will never be used for human habitation without first becoming fully compliant with the Floodplain Management Ordinance in effect at the time of conversion,
3. That all interior walls, ceilings, and floors below the Flood Protection Elevation shall be unfinished or constructed of flood resistant materials,
4. That mechanical, electrical, or plumbing devices shall not be installed below the Flood Protection Elevation,
- 5. [At the time of inspection this property required _____ square inches of venting. Requiring _____ vents and _____ crawl space access door(s) used to meet the flood venting requirements of the City of Sea Isle City,]
6. That this **Non-conversion Agreement** becomes part of Permit Number _____ and grants the City of Sea Isle City the ability to inspect and enforce the provisions of this **Agreement** at any time.

Sea Isle City, NJ implements Non-Conversion Agreements and Flood Ventilation compliance checks to ensure that inhabitable spaces do not get converted to habitable, finished spaces in the future.

NFIP FLOOD LOSS PREVENTIONS

“Helping Realtor’s Sell Homes in Flood Zones”

1 CE NJ, IL, TX



About Us

20+

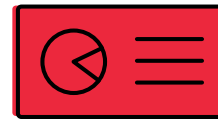
Years Helping
Others



All Staff
Are CFMs



Outreach
In All States



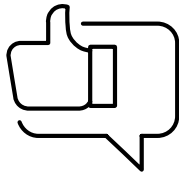
Educating Real
Estate Industry

About Us



83%

Average Savings
Track Record



5000+

Insurance
Reviews



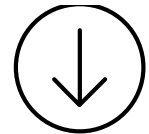
37%

Cases Paid
Lower Premiums



3.3m

Mitigation
Cases Solved



8.4m

Total premium
Reduction

Flood Statistics

Flooding is the #1 natural disaster in the US

In fact, all 50 states have experienced floods in the past 5 years



70%

of Hurricane Harvey losses
were outside flood zones



20%

of NFIP claims are
in mid - low risk areas



94%

of Americans don't
have flood insurance

Solutions

1

Mitigate to
compliance

2

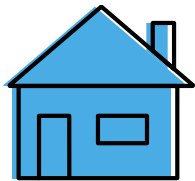
Correct
Rating

3

Private Flood
Insurance

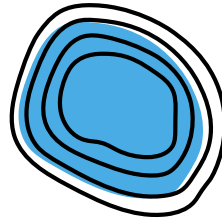
National Flood Insurance Program

PROTECTING STRUCTURES BUILT IN FLOODPLAINS



Floodplain Management

Building Codes &
Zoning



Hazard Identification

Flood Mapping



Low-Cost Flood Insurance

Participating
Communities

Flood Risk Zones

LOW

X (unshaded)

MID

X (shaded)

HIGH

Riverine/Tidal
A, AH, AO, AE

Coastal VE

MANDATORY

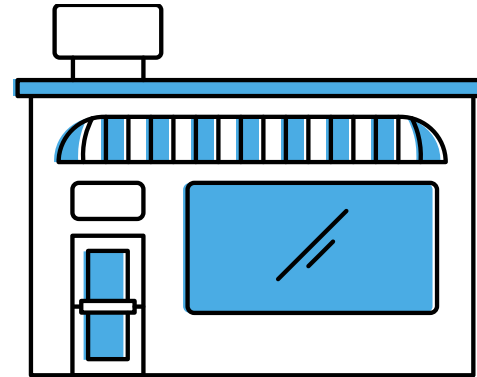
Coverage Limits



RESIDENTIAL

\$250,000 building

\$100,000 contents



COMMERCIAL

\$500,000 building

\$500,000 contents

The Cause of Reforms

PREMIUM GENERATED

Katrina - 2005
\$1.9 billion

Sandy - 2012
\$3.3 billion

Harvey - 2017
\$3.3 billion

\$20B

AMOUNT PAID OUT

\$15B

\$10B

\$5B

0

'05

'06

'07

'08

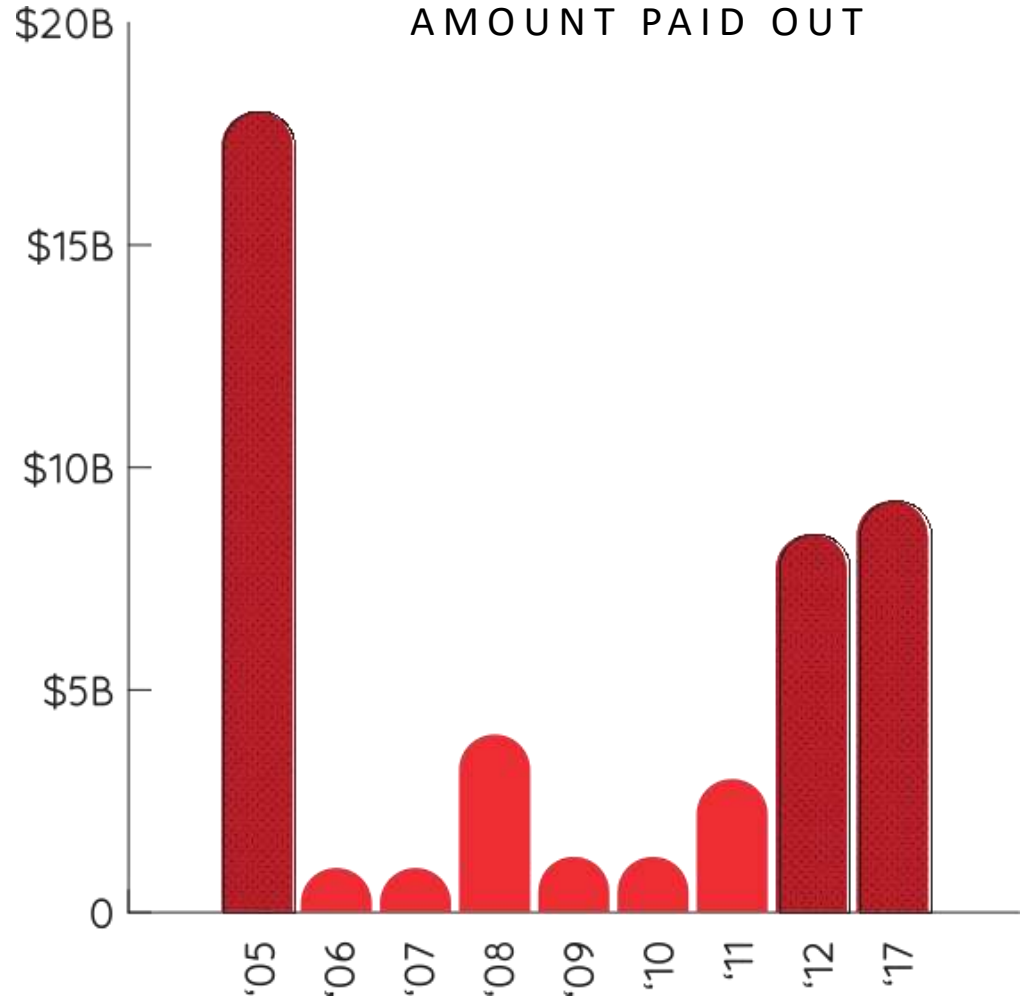
'09

'10

'11

'12

'17



Policy Changes

APR 1, 2015

\$25 SURCHARGE PRIMARY \$250 NON-PRIMARY

BIGGERT Waters Reform
GRIMM Waters (HFIAA)
9% increase for everyone

ACTUARIAL RATES

1

Non-Primary
Residences

2

Subsidized
Rates

3

Business
Properties

4

Severe
Repetitive Loss

Private Flood Insurance Quotes

Enter Street, City, State Zip Residential Quote Commercial Quote

Residential Commercial Both Policy Quote Both

Private vs NFIP

	NFIP	PRIVATE
Elevation Certificate	✓	X
Personal Property & Basements	X	✓
Effective in 10 Days	X	✓
Loss of Use Coverage	X	✓
Decks Coverage	✓	✓
Carports Coverage	X	✓
20–50% Cost Savings	X	✓
Earthquakes & Eruptions	X	✓

Questions or Misconceptions

It's not affordable

Can they pay my claim?

Will my mortgage lender accept it?

Peoria, IL

CASE STUDY



Statistics

Built - 1952 **Zone** – A13 **BFE** – 460

Elevated – 1992 (460.59) **Residence** – Primary

Building Diagram - 7 Unfinished

~~\$2,038~~

NFIP Premium

Agent Errors

DESCRIPTION

	Contents Location
--	-------------------

Enclosure: Y
 Enclosure: **Enclosure with proper openings; Includes Addition and Extension**

No Flood Vents

Substantial improvement was on **06/01/1920**

Mislabeled 1920

May Apply. See Your Policy for Details.

ADDITIONAL INFORMATION

CITY OF No: 1705360015B
 Flood Risk/Rated Zone: A13 Current Flood Zone: A13 Elevation Difference: 1 Grandfathered: N

RATING INFORMATION

Coverage Limit	Deductible	Rate	Deductible Discount	Premium
177,000	\$ 1,000	00.57/00.09	\$ 0.00	\$ 447.00
0	\$ 0	00.00/00.00	\$ 0.00	\$ 0.00
ICC PREMIUM				\$ 5.00
ANNUAL SUBTOTAL				\$ 452.00
RESERVE FUND ASSESSMENT				\$ 23.00
FEDERAL POLICY FEE				\$ 44.00
TOTAL PREMIUM				\$ 519.00
ENDORSEMENT PREMIUM				\$ -2,038.00

THIS IS NOT A BILL

Surveyor Errors

U.S. DEPARTMENT OF HOMELAND SECURITY Federal Emergency Management Agency National Flood Insurance Program		ELEVATION CERTIFICATE	
		Important: Read the instructions	
SECTION A - PROPERTY INFORMATION			
A1. Building Owner's Name Robert Wagner			
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Rte. 4218 N Galena Road City Peoria State IL ZIP Code 61614			
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description) A parcel of land in Sec. 28, T9N, R8E, 4TH PM, described in Doc. NO. 05-28628 in			
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) Res			
A5. Latitude/Longitude: Lat. 40°44.315' Long. 89°33.149' Horizontal Datum: <input type="checkbox"/>			
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain			
A7. Building Diagram Number 1A			
A8. For a building with a crawlspace or enclosure(s):			
a) Square footage of crawlspace or enclosure(s)		_____ sq ft	
b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade		_____ sq in	
c) Total net area of flood openings in A8.b			
d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No			
SECTION B - FLOOD INSURANCE RATE MAP INFORMATION			
B1. NFIP Community Name & Community Number Peoria 170536		B2. County Name Peoria	
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index	B7. FIRM Effective Date

Should be Diagram 7

Should be 968 ft²

Diagram Number 7	_____ sq ft
g with a crawlspace or enclosure(s):	_____ sq ft
otage of crawlspace or enclosure(s)	_____ sq ft
of permanent flood openings in the crawlspace	5
ure(s) within 1.0 foot above adjacent grade	1000*
area of flood openings in A8.b	_____ sq in
ed flood openings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
SECTION B - FLOOD INSURANCE RATE MAP INFORMATION	

Elevation Certificate

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number Peoria 170536		B2. County Name Peoria		B3. State IL	
B4. Map/Panel Number 170536 0015	B5. Suffix B	B6. FIRM Index Date February 1, 1980	B7. FIRM Panel Effective/Revised Date February 1, 1980	B8. Flood Zone(s) A13	B9. Base Flood Elevation(s) (Zone AO, use base room depth) 460.0

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.

FIS Profile FIRM Community Determined Other (Describe) _____

B11. Indicate elevation datum used for BFE in Item B9: NGVD 1929 NAVD 1988 Other (Describe) _____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? Yes No
Designation Date _____ CBRS OPA

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: Construction Drawings* Building Under Construction* Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized GPS Vertical Datum NGVD1929

Conversion/Comments _____

Check the measurement used.

- | | | |
|--|-------------------|---|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor) | 450.93 | <input checked="" type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only) |
| b) Top of the next higher floor | 400.93 | <input checked="" type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only) |
| c) Bottom of the lowest horizontal structural member (V Zones only) | | <input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only) |
| d) Attached garage (top of slab) AUXILIARY GARAGE STRUCTURE | 451.10 | <input checked="" type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only) |
| e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | | <input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only) |
| f) Lowest adjacent (finished) grade next to building (LAG) | 450.81 | <input checked="" type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only) |
| g) Highest adjacent grade | | (Puerto Rico only) |
| h) Lowest adjacent grade | | (Puerto Rico only) |

Without Flood Openings

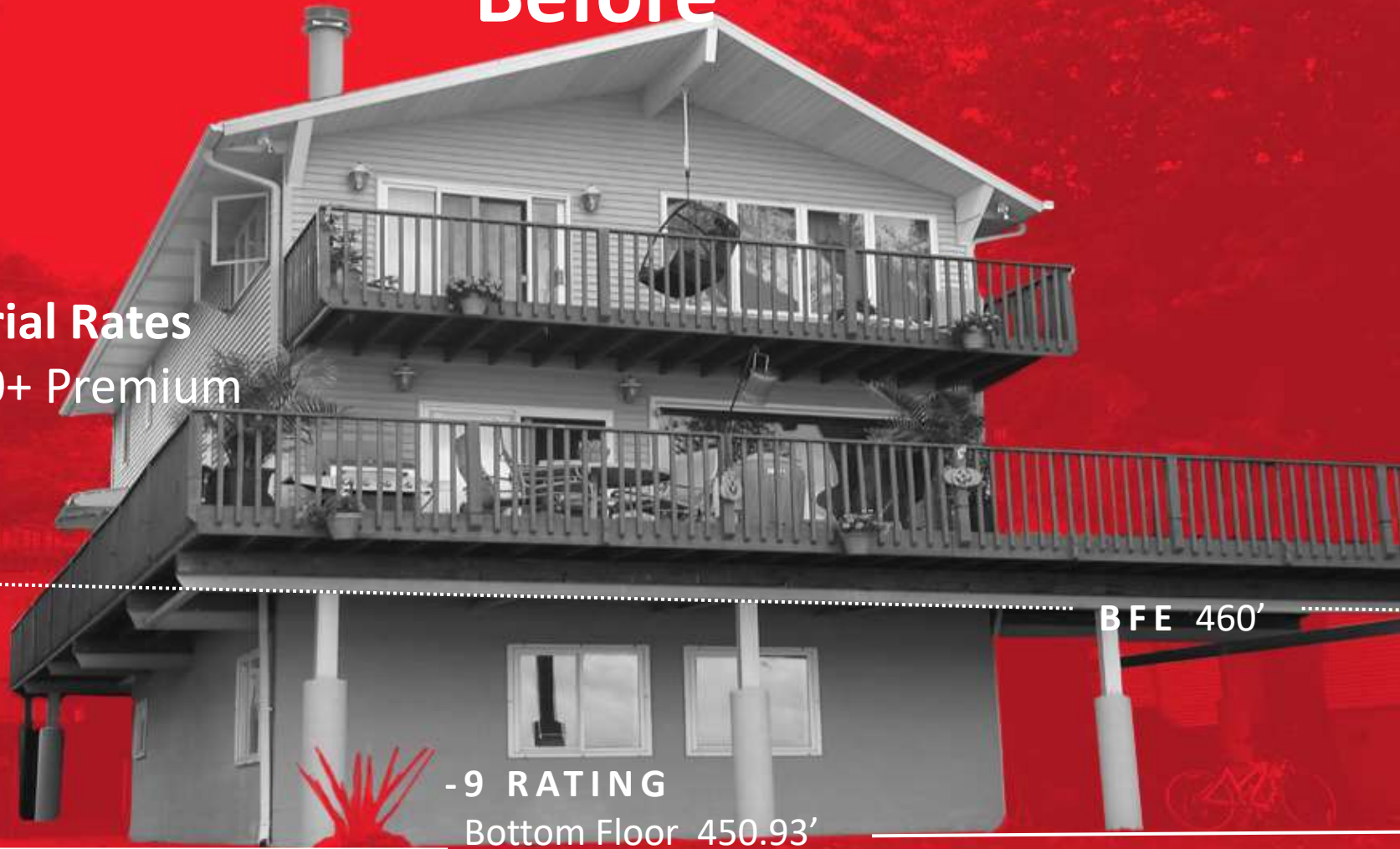
- 9 RATING

Exempt Unfinished Level

+ 1 RATING

Before

Actuarial Rates
\$9,000+ Premium



BFE 460'

-9 RATING

Bottom Floor 450.93'

1 - No Flood Openings 2 – Construction Date 3 – Rates Shouldn't Be Subsidized

After

+1 RATING

Higher Floor 460.69'

BFE 460'



Insulated
Smart Vents

Installed Vents

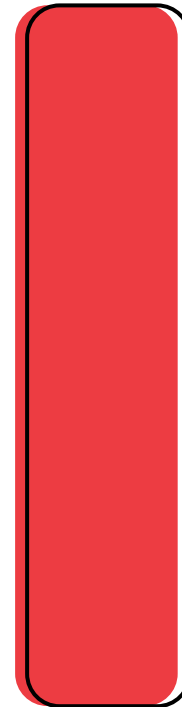


Vents are installed in a 16" x 8" hole, the opening left when (1) CMU block is removed.

New Premium

Retrofit Cost - \$1,200

\$2,038



\$511



75%

WRIGHT
Flood

Wright National Flood Insurance Company
A Stock Company
PO Box 33003
St. Petersburg, FL 33733
Office: 800.820.3242
Fax: 800.850.3299

POLICY INFORMATION			
Policy Number	12 1151213418 00	Application Date	12/23/2014
Policy Period	01/23/2015 to 01/23/2016	Premium paid by	Levite
Agency Number	734279	Insured Name	ROBERT WAGNER
Agency	RISK REDUCTION PLUS GROUP INC	Property Address	4218 N GALDINA RD
Agency Address	430 ANDRINO DR UNIT 1	PSC/R/A, S, 81614-0047	
Agency Phone	PITMAN, NJ 08071-1251	Insured's Phone	(309) 231-6732
Agent Phone	(877) 411-6388		
ZONE INFORMATION			
Current Flood Zone	A12	Zone Determination	Yes
Current Community Number	17030	Certificate #	00067072
Current Map Panel / Suffix	0019 B	Determination #	DRP000000000000000025
RATING INFORMATION			
Building Occupancy	Single Family	Community Name	PSC/R/A, CITY OF
Number of Floors	Three or More Floors	Grandfathered	No
Basement/Enclosure/Creeppace	Enclosure		
COVERAGE / PREMIUM INFORMATION			
Coverage	Limits	Deductible	Premium
Building	\$177,000.00	\$1,250.00	\$440.00
Contents	\$0.00	\$0.00	\$0.00
PAYMENT INFORMATION			
Payment Method	Check	Annual Subtotal	\$440.00
Name of Check Holder	Levite	Deductible Credit	(\$7.00)
Check #	181626H	RCC Premium	\$5.00
Check Date	12/23/2014	Community Discount	\$0.00
Check Owner Signature		Reserve Fund Assessment 5%	\$22.00
Amount	\$ 511.00	Federal Policy Service Fee	\$44.00
		Total Premium	\$511.00



“Our premium went from \$2,038 a year to \$511! We even received a refund check for the difference, since we paid for the year!”

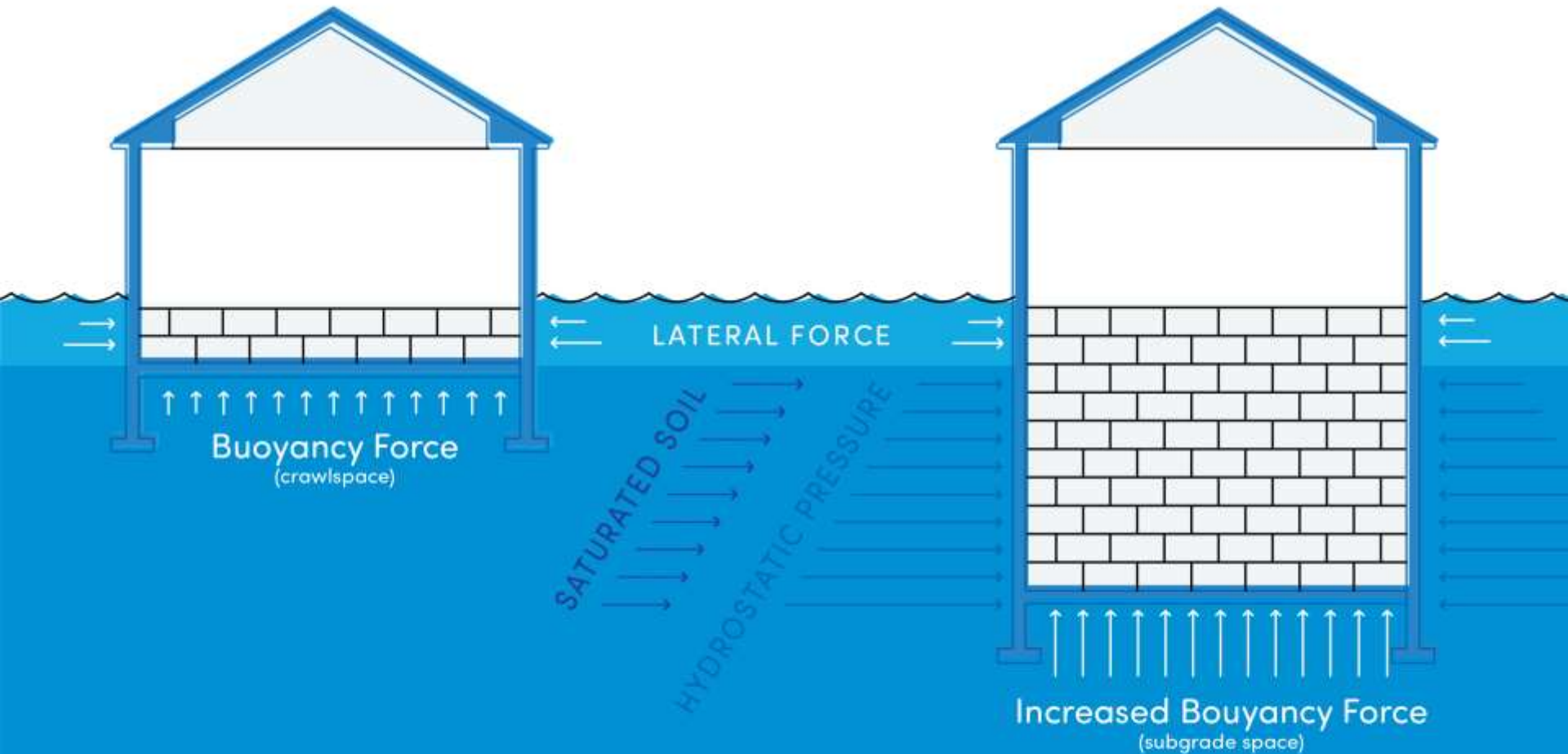


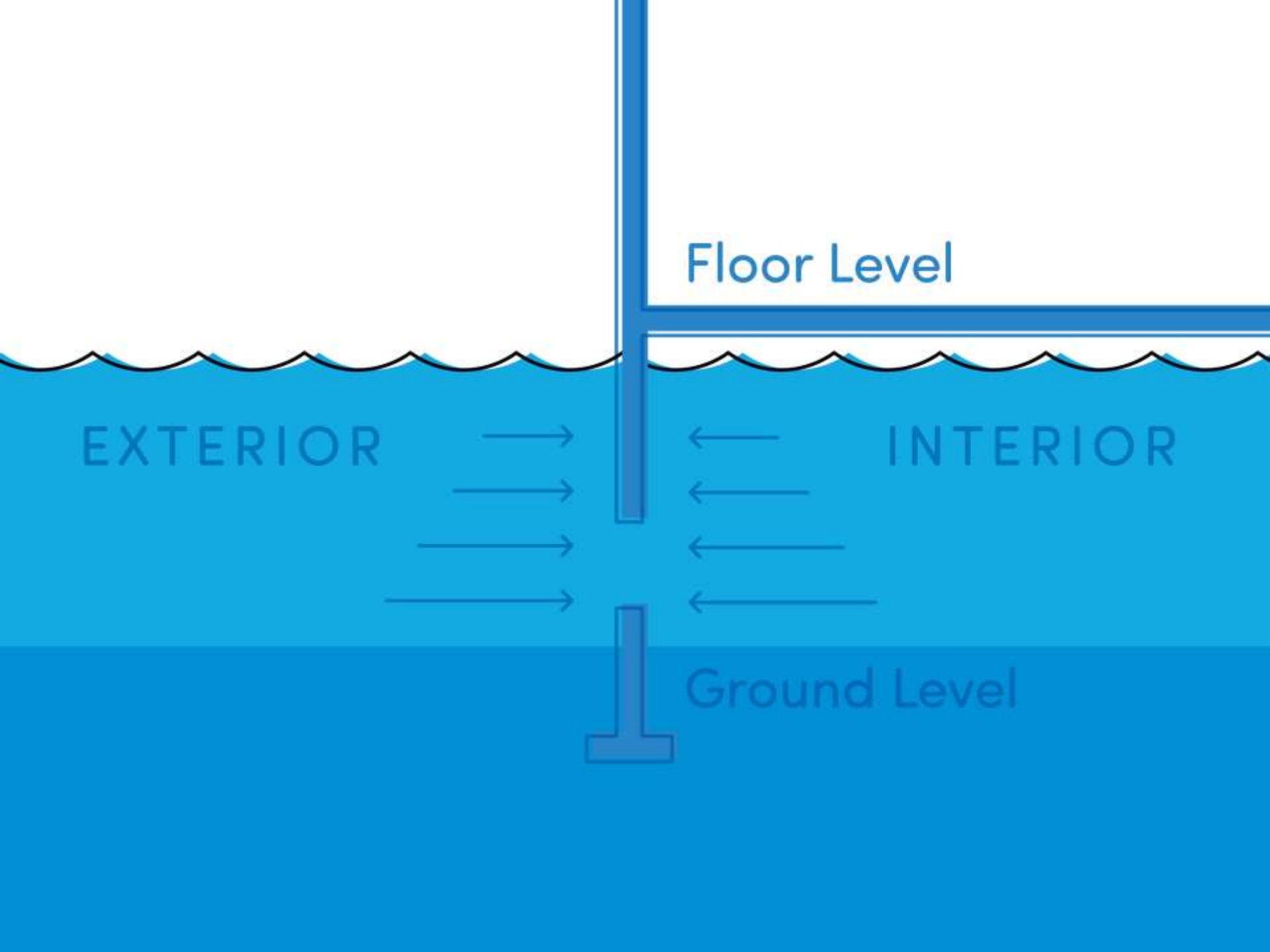


What Could Have Happened



Hydrostatic Pressure





Floor Level

EXTERIOR

INTERIOR

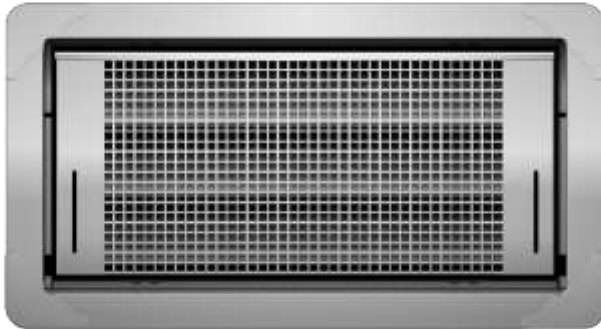
Ground Level

An automatic opening that
~~protects~~ protects your foundation by
allowing ~~bi-directional~~ bi-directional water flow
which equalizes ~~hydrostatic~~ hydrostatic
~~hydrostatic~~ hydrostatic pressure

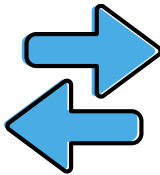
316L STAINLESS STEEL / 200FT² / 3" OPENING

What Are Flood Vents?

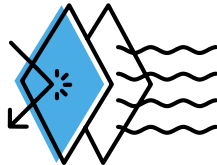
ICC-ES CERTIFIED PASSIVE RELIEF



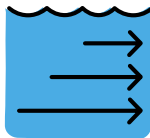
Performance Tested



Bi-Directional Water Flow



Ventilation or Insulation



Hydrostatic Pressure Relief



Flood Water Activated

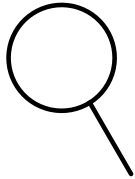


Flood Risk Evaluator

TOP POLICY ERRORS

- Incorrect Residency Status
- Pre-FIRM structure not rated
- Undocumented Flood Vents
- Incorrect Building Diagram Number
- Unaware of Eligibility for LOMA

Report Benefits



Policy Mistakes
Flood Zones
Requirements



A FREE flood insurance quote from RRPG



Products that can lower your premium

U.S. DEPARTMENT OF HOMELAND SECURITY
FLOODING EMERGENCY MANAGEMENT AGENCY
Federal Flood Insurance Program

ELEVATION CERTIFICATE

IMPORTANT: Follow the Instructions

SECTION A - PROPERTY INFORMATION

41. Building Name: REVERE
42. Address: REVERE ST.
43. City: REVERE, MA
44. State: MA
45. Zip: 01956-18
46. Parcel Number: 25028C 0036
47. Flood Insurance Rate Map (FIRM) Index Date: 8-25-09
48. Flood Zone: A
49. Flood Hazard Category: 1
50. Flood Hazard Description: 1
51. Flood Hazard Category: 1
52. Flood Hazard Description: 1

SECTION B - FLOOD INSURANCE RATE MAP

53. Flood Insurance Rate Map (FIRM) Index Date: 8-25-09
54. Flood Zone: A
55. Flood Hazard Category: 1
56. Flood Hazard Description: 1

SECTION C - BUILDING ELEVATION INFORMATION

57. Building Elevation Information: 4
58. Building Elevation Information: 4
59. Building Elevation Information: 4
60. Building Elevation Information: 4

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT

61. Name: ALBERT A. ROMANO
62. Address: BROADWAY
63. City: WAKEFIELD
64. State: MA
65. Zip: 01880-15
66. Date: 11-5-15

Flood Risk Evaluation Report

Steps to Lowering Your Flood Insurance

CLIENT Name Address City State Zip Phone Email	CURRENT PREMIUM	\$5,615
	CURRENT NFIP RATING	-2
INSURED BUILDING Name Address City State Zip	POTENTIAL FRE PREMIUM	\$946
	POTENTIAL FRE NFIP RATING	+2
PREPARED BY Andrew Farrell, CFM CFM #US-17-010130 609-317-5905 afarrell@riskreductionplus.com	ANNUAL SAVINGS	
	1 YEAR	\$4,669
	5 YEARS	\$23,345
	10 YEARS	\$46,690
REPORT REQUESTED BY Insurance Agent	PREMIUM REDUCTION	
	83%	
STEPS TO LOWERING YOUR FLOOD INSURANCE		
Additional venting is needed for improved compliance. See Page 3.		
REPORT REQUESTED BY Insurance Agent	INSURANCE RENEWAL N/A	POTENTIAL REFUND \$4,669.00

©2019 Flood Risk Evaluator - A Division of Smart Vent Products, Inc. Findings within this report are based on available information provided in an Elevation Certificate. Images are representations of typical building diagrams & may not describe the building exactly.

yourfloodrisk.com | 866.599.7066

fre FLOOD RISK EVALUATOR



Ocean City, NJ

CASE STUDY

Before



BFE 9'

Bottom Floor 7.16'

- 2 RATING

1 – Inadequate flood venting



After

+1 RATING

Next Floor Retrofit 10.18'

BFE 9'

1 – Inadequate flood venting



More than 12"

Statistics

Built - 1952

Zone - AE

BFE – 9'

Residence – Primary Building Diagram - 8

~~\$2,977~~

NFIP Premium

New Premium

RETROFIT COST - \$3,500



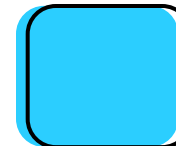
Wright National Flood Insurance Company
 A Stock Company
 PO Box 33003
 St. Petersburg, FL, 33733
 Office: 800.820.3242
 Fax: 800.850.3299

AGENCY INFORMATION		QUOTE INFORMATION		
Agency Number	734276	Quote Number	29 QT43467184 89	
Agency	RISK REDUCTION PLUS GROUP INC	Applicant	O'CONNOR, DOLORES	
Address	430 ANDRO DR UNIT 1,	Current Date	10/22/2014	
City, State, Zip	PITMAN, NJ 08071-1251	Effective Date	11/01/2014	
Phone Number	(877) 441-8366			
COMMUNITY INFORMATION				
Program Type	Flood Regular Policies	Zone Determination Number	DRF0000000006480979	
Community	345310 - OCEAN CITY, CITY OF	Zone Reference Number	54090057	
Flood Risk/Flat Zone	A07			
BUILDING INFORMATION				
Property Address	229 CENTRAL AVE	Construction Coverage	None	
City, State, Zip	OCEAN CITY, NJ 08225-4125	Construction Date	01/01/1952	
Occupancy Type	Single Family	Building Replacement Cost	\$250,000.00	
Building Type	Two Floors	Building Elevated	Building is elevated	
Elevation Certificate	Yes	Elevation Difference	1 feet	
Lowest Floor Elevation	10.1 feet	Building Flood Proofed	No	
Location of Contents	Lowest Floor Above Ground Level and Higher Floors			
COVERAGE/PREMIUM INFORMATION				
Coverage	Limits	Deductible	RPH Basic	RPH Additional
Building	\$250,000.00	\$1,250.00	0.57	0.09
Contents	\$25,000.00	\$1,250.00	0.38	0.12
Discount/Charge				\$12.00
1 Year Premium				\$547.00

\$2,977

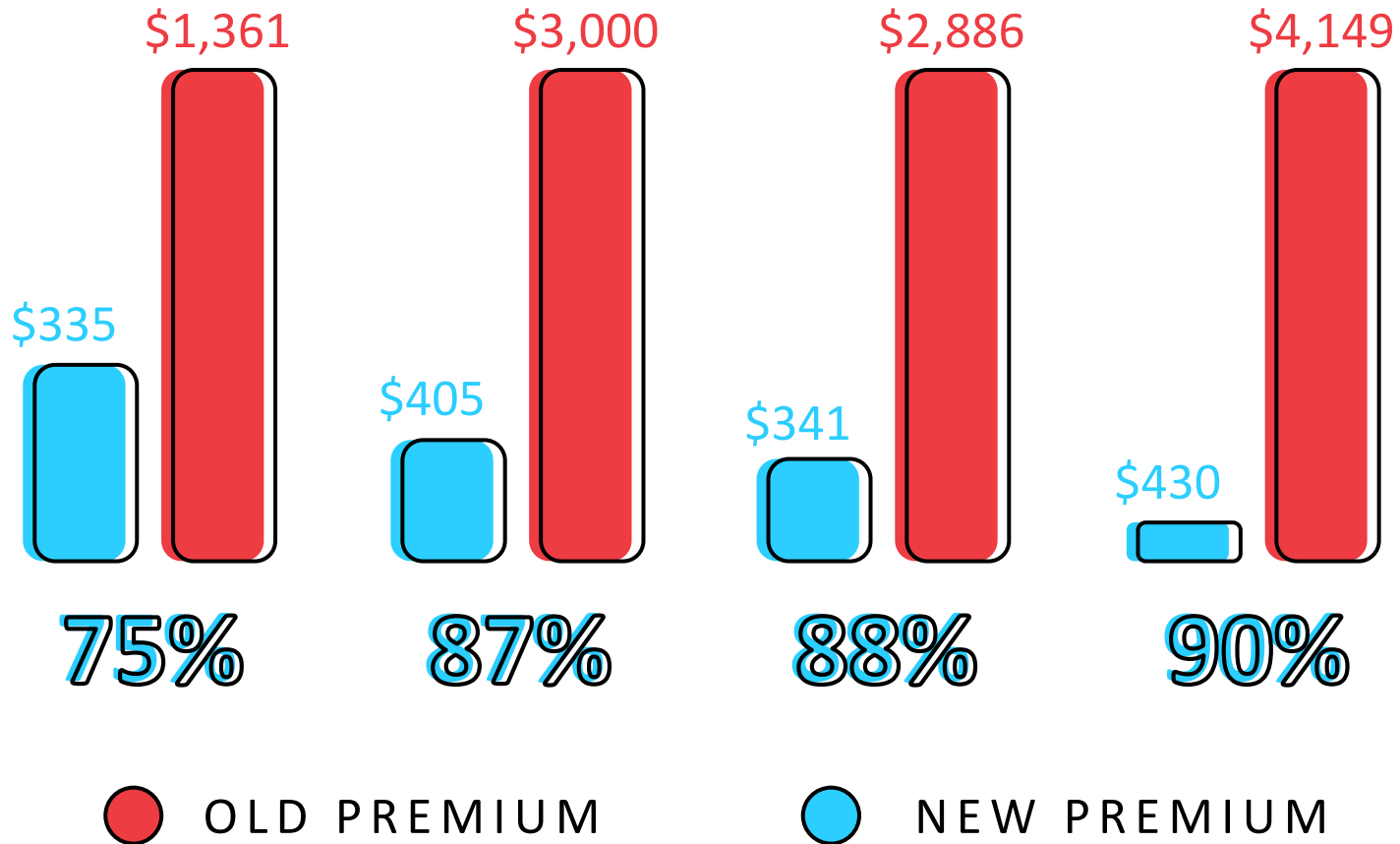


\$547



82%

How Much Others Have Saved



Examples are on a case-by-case basis. Homeowners saved an average of 83%.

Lowering Flood Insurance

STEPS CLIENTS CAN TAKE TO SAVE MONEY

1

SEND

Your Documents
for Review

2

RECEIVE

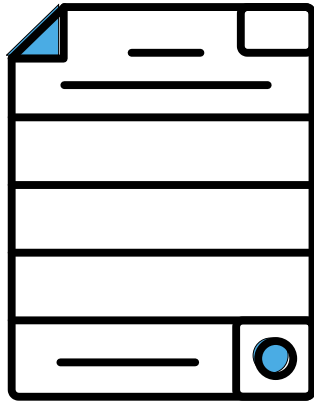
FREE Flood
Insurance Report

3

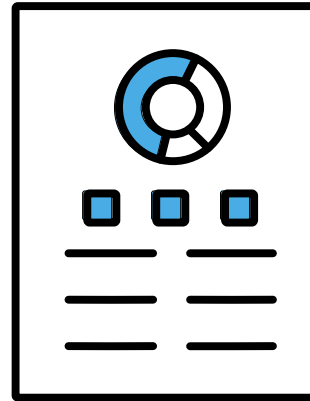
REVIEW

See How Much
You Can Save!

Documents Needed



Elevation
Certificate



Current Flood
Insurance Policy

Send to ec@yourfloodrisk.com

Questions?

866-599-7066



Robert Lemley, CFM
Flood Mitigation Specialist

rlemley@floodproofing.com

o 877-441-8368 | c 832-992-8368



CITY OF HOUSTON PROGRAM FOR PUBLIC INFORMATION (PPI)



SANDRA DESHOTEL, M.B.A., CFM
COMMUNITY RATING SYSTEM COORDINATOR



CITY OF HOUSTON DEMOGRAPHICS

Houston is the most populous City in the state of Texas and the fourth most populous City in the United States.

- 2019 Census-estimated population of 2.32 million people within a land area of 671 square miles,
- The largest City in the Southern United States and the fifth most populated metropolitan area in the United States.
- A little more than 40 feet above sea level and about 40 miles from the gulf coast.

“Houston is naturally prone to flooding and vulnerable to hurricanes”

HURRICANE HISTORY



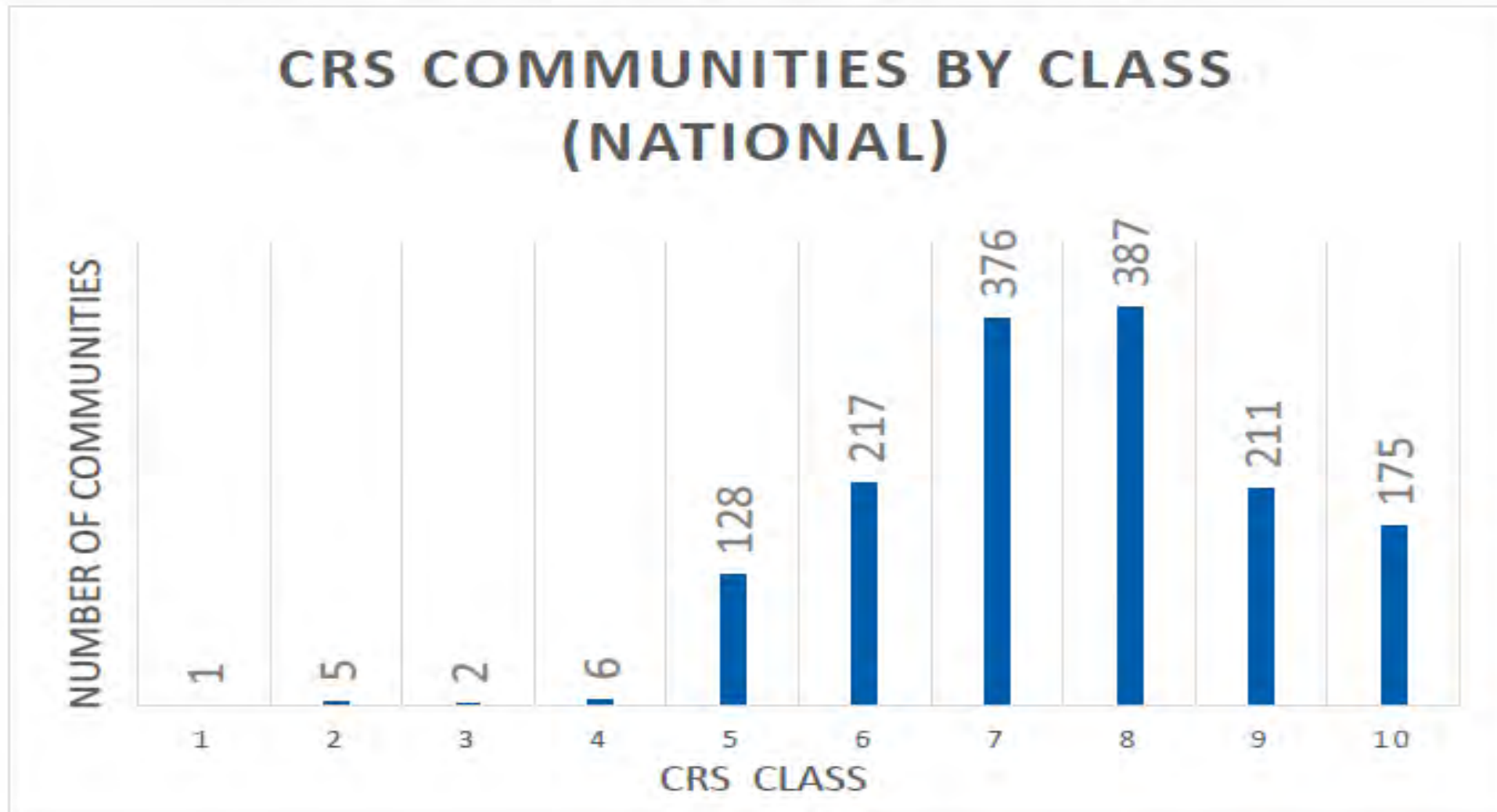
- **2015 - Memorial Day Flood Event**
- **2015 - Halloween Flood Event**
- **2016 – Tax Day Flood Event**
- **2017 - January Flood Event**
- **2017 – Harvey Flood Event**
- **2018 - Kingwood Flood Event**
- **2019 – Imelda Flood Event**

CITY OF HOUSTON CRS COMMUNITY HISTORY



- **1979 - Entered the NFIP Program**
- **2001 - Entered the CRS Program at a Class 8**
- **2006 - Improved to a Class 7**
- **2007 - Improved to Class 6**
- **2009 - Improved to a Class 5**
- **2021 – Presently, a Class 5**

CITY OF HOUSTON NATION WIDE



PROGRAM FOR PUBLIC INFORMATION (PPI) PLAN

THE COH

- IDENTIFY
- PREPARE
- IMPLEMENT
- MONITOR

THE PUBIC

- INFORM TO MAKE BETTER DECISIONS
- TAKE STEPS TO PROTECT THEMSELVES FROM FLOODING
- SUPPORT FLOODPLAIN MANAGEMENT EFFORTS
- MAKE EFFORTS TO PROTECT THE NATURAL FUNCTIONS OF THE FLOODPLAIN

PPI COMMITTEE MEMBERS



- OFFICE OF EMERGENCY MANAGEMENT (OEM)
- HARRIS COUNTY FLOOD CONTROL (HCFCD)
- BAYOU PRESERVATION
- HOUSING AND COMMUNITY DEVELOPMENT DEPT. (HCDD)
- INSURANCE COMPANIES
- REAL ESTATE COMPANIES
- HOUSTON METROPOLITAN FEDERAL CREDIT UNION (HMFCU)
- ENGINEERING FIRMS
- HOUSTON PUBLIC WORKS PUBLIC INFORMATION OFFICER
- RESIDENTS

Flood Insurance Assessment (FIA) and Coverage Improvement Plan (CP)

Need-Area	H.O.A. / Method of Outreach	Super Neighborhood
M-2015-025	Garden Villas Community	Greater Hobby Area
M-2015-020	Mayor's letter	Central Southwest
M-2015-028	Mayor's letter	Lawndale / Wayside
M-2015-030	Mayor's letter	Greater Hobby Area
M-2015-009	Greater Magnolia Pineview Place Civic Club	Magnolia Park
M-2015-011	Mayor's letter	Astrodome Area
M-2015-027	Mayor's letter	Central Southwest
M-2015-032	South Acres West Civic Club	South Acres / Crestmont Park
M-2015-015	Central City Civic Club	MacGregor
M-2015-018	Langwood II Civic Club	Langwood
M-2015-019	Mayor's letter	Astrodome Area
M-2015-007	MacGregor Trail Civic Club	Greater OST / South Union
M-2015-002	Mayor's letter	Kashmere Gardens
M-2015-014	Mayor's letter	Independence Heights
M-2015-026	Mayor's letter	Sharpstown
M-2015-029	Mayor's letter	Central Southwest
M-2015-004	Westwood Civic Club	Willow Meadows/Willowbend Area
M-2015-024	Mayor's letter	IAH / Airport Area
M-2015-005	Stonehenge Association	Eldridge / West Oaks
M-2015-017	Mayor's letter	East Little York / Homestead
M-2015-021	University Place District	University Place
M-2015-J01	Uptown Houston Association	Greater Uptown
M-2015-022	South MacGregor Civic Club, Inc.	MacGregor
M-2015-006	Northwood Manor	East Little York / Homestead
M-2015-012	Near Northwest Management District	Central Northwest
M-2015-008	South MacGregor Civic Club, Inc.	MacGregor
M-2015-C01	Cottage Grove Civic Club	Washington Avenue Coalition / Memorial Park
M-2015-031	Sagemont Civic Club	South Belt / Ellington
M-2015-001	Freeway Manor Civic Club	Edgebrook Area
M-2015-023	River Oaks Property Owners	Afton Oaks / River Oaks Area
M-2015-013	Southwest Security Association	Meyerland Area
M-410028	Westbury Civic Club, Inc.	Westbury
M-2015-003	Candlelight Forest Civic Club	Greater Inwood
M-2015-010	Mayor's letter	Gulfton

TARGET AUDIENCES

The PPI Committee met three times throughout 2020 concluding that both the general population as well as these specific groups should be targeted for community outreach.

- Target Audience #1 – Community at Large
- Target Audience #2 – SFHA and Repetitive Loss Properties
- Target Audience #3 – Builders, Contractors and Engineers
- Target Audience #4 – Real Estate, Insurance Agents and Financial Institutions



PRIORITY TOPICS

- **A.** Know your flood risk
- **B.** Insure your property for your flood hazard
- **C.** Protect people from the flood hazard
- **D.** Protect your property from the flood hazard
- **E.** Build responsibly
- **F.** Protect natural floodplain functions

Additional Initiative

- **G.** Hurricane Evacuation
- **H.** Stormwater Management

TOPICS

Topic	Outcome	Related CRS Priority Message
A. Know your flood risk	Increased flood information inquiries to Houston Public Works	<ol style="list-style-type: none">1. Check the online maps at GIMS to see if your property is in the floodplain2. Find out if your property is subject to flooding. Contact FMO at fmo@houstontx.gov3. Find out if you are in a mapped flood zone. Visit https://msc.fema.gov.4. Find out about historical flooding conditions by visiting http://floodplain.houstontx.gov
B. Insure your property for your flood hazard	Increase number of flood policies community-wide	<ol style="list-style-type: none">1. Don't delay, buy flood insurance today. There is a 30-day waiting period before policies are effective.2. Purchase flood insurance to protect your assets. Contact an insurance agent to get covered.3. Did you know half of all flooded properties happened outside the floodplain? Ask your insurance agent about a preferred risk policy.4. Are you renting? Get contents-only coverage to protect your assets. Contact an insurance agent to get covered.

TOPICS

<p>C. Protect people from the flood hazard</p>	<p>Reduce number of water rescues, police citations for ignoring barricades</p>	<ol style="list-style-type: none">1. Go to https://www.harriscountyfws.org/ to check bayou levels.2. Turn around, don't drown. Don't drive around barricades.3. Sign up for AlertHouston and stay aware of hazardous conditions.4. Steer clear of flood-prone streets. Roadways are designed to flood.
<p>D. Protect your property from the flood hazard</p>	<p>Increase number of applications for flood protection projects</p>	<ol style="list-style-type: none">1. Reduce potential flood damage. Contact FMO for ways to update your home.2. Reduce damage to existing structures. Elevate your water heater, air condition unit and electrical panel.3. Contact FMO about grant opportunities to elevate your property.4. Store your valuables and important documents in a waterproof container in the highest point on your property.5. Contact Harris County Flood Control District about property buy-out opportunities.

TOPICS

Topic	Outcome	Related CRS Priority Message
E. Build responsibly	Reduce number of building department citations	<ol style="list-style-type: none"> 1. If you are building in the floodplain, find out what permits are required at www.houstonpermittingcenter.org 2. Be aware of substantial improvement rules. Contact FMO. 3. Hire a licensed surveyor, architect, or engineer to complete an elevation certificate. 4. You must get a permit to bring fill onto a property in the City-regulated floodplain. Visit FMO to obtain your permit.
F. Protect natural floodplain functions	Improved water quality of rivers, wetlands, streams	<ol style="list-style-type: none"> 1. Don't trash the bayous and rivers. Trash washes back into a community during a flood storm. 2. Lend a hand, take care of the land. Call 3-1-1 to report dumping in the floodplain. 3. Don't pollute bayous and rivers. Houston gets its drinking water from surface water. 4. Stay on the path when visiting a bayou park. Our floodplains are critical habitat for wildlife.

INITIATIVES

G. Hurricane Evacuation	Minimize loss of life in hurricanes and evacuations	<ol style="list-style-type: none">1. Have a plan for hurricane evacuation. Visit http://www.readyhouston.tx.gov/.2. Sign up for AlertHouston and stay informed about hurricane evacuation.3. Know your evacuation route. Visit OEM website to download your evacuation guide. https://www.houstonoem.org/preparedness-are-you-ready/4. Carry a digital copy of your prescription in case of evacuation.5. Visit https://www.h-gac.com/hurricane-evacuation-planning to plan your evacuation route.6. Only evacuate when directed by emergency management officials.
H. Stormwater Management	Increased participation in clean out projects; increased participation in Adopt-a-Drain program and Protect the Pipes campaign	<ol style="list-style-type: none">1. Steer clear of flood-prone streets. Roadways are designed to flood.2. Only rain down the drain. Don't dispose of anything down the drain.3. Adopt a drain. Clear debris from storm drains to prevent flooding. https://mycity.houstontx.gov/adopta/4. Give a hoot, don't pollute. Call 3-1-1 to report stormwater pollution violations.

PUBLIC INFORMATION EFFORTS

Organization	Project	Subject Matter	Frequency
Floodplain Management Office	Insert in water bill to SFHA areas and letter to Repetitive Loss property residents	Various flood-related topics, including specific advertisement of CRS Activities 320, 360, and 440.	Annually
Floodplain Management Office	Update flood information in public library	Various flood-related topics	As needed
Floodplain Management Office	Flood information inserted in water utility bill	Various flood-related topics	Annually
Engineering Dept./Floodplain Management office home page	Disseminate comprehensive flood information	Various flood-related topics	Year-round
Floodplain Management Office	Flood Awareness Week	Promote flood mitigation and reducing flood risk, flood insurance availability, demonstrate flood model to Houston-area elementary students	Annually or Bi-Annually
Floodplain Management Office	Disseminate post-flood response packet to residents utilizing brochure, flyers, permit process	Educate residents regarding need for permits to rebuild, flood safety tips, promote purchase of flood insurance	Annually

PUBLIC INFORMATION EFFORTS CON'T

City website / Houston Public Works	Promote natural floodplain area protection	“Only water goes down the drain”, hazards of dumping debris and home-based chemicals in drains	Year-round
Floodplain Management Office	Work with public broadcasting channel to promote flood information	Various flood-related topics	Annually
Harris County Flood Control District	Ready Harris	Hurricane Preparedness	Year-round
Harris County Flood Control District	Ready Harris	Flood Risk Reduction information by Channels and Bayous Watershed	Year-round
Harris County Flood Control District	Harris County Modeling, Assessment and Awareness Project (MAAPnext)	New mapping methodologies and technologies that will provide better understanding of flood risks	Year-round
Harris County Flood Control District	Flood Warning System FWS	Measures rainfall amounts and monitors water levels in bayous and major streams on a real-time* basis to inform you of dangerous weather conditions.	Year-round
Harris County Flood Control District	Home Buyout Program	Restores floodplain through buyouts	Year-round

PUBLIC INFORMATION EFFORTS CON'T

Houston- Galveston Area Council	Home Buyout Program	Regional Hazard Mitigation Planning	Year-round
H-GAC / Federal Emergency Management Association	Hazard Mitigation Assistance Guide	Hazard Mitigation	Year-round
Community Impact Newspaper (Bayou Preservation Assn)	Thinking Outside of the Box for a Flood Resistant Houston – Flood Resistance Series	Flood Resistance	Year-round
Realtor.com	App - Flood Risk Data for Homes	Flood risk of a location when thinking about home purchase	Year-round
Houston Properties	Guide to Houston's Best Neighborhoods - Houston Flooding Guide	Houston flood zones	Year-round
American Red Cross	Flood Safety Preparedness	Flood safety	Year-round

PUBLIC INFORMATION EFFORTS CON'T

Organization	Project	Subject Matter	Frequency
Harris County Flood Control District	96 Community Engagement Meetings	Meetings to discuss flood reduction projects by watershed	Year-round
Harris County Engineering Dept	Regulations of Harris County, Texas for the Approval and Acceptance of Infrastructure Manual	Infrastructure regulations effective 9/29/2020	Year-round
Harris County	Community Flood Resilience Task Force	The County Judge's Office hosted approximately 150 people across the 3 virtual dialogues and read 200 email comments in which community members shared a wide range of perspectives and hopes for the Task Force.	3 Virtual Meetings
Harris County Flood Control District	Customer Satisfaction Survey	Feedback from community regarding HCFCD	As needed
Harris County Engineering Dept	Harris County Residential Permitting Brochure	Residential permitting	Year-round
Harris County Engineering Dept	Harris County Residential Building Code Standards	Building codes	Year-round

PROJECTS AND INITIATIVES

OP	Target Audiences	#Topics/ Message (see Table 2)	Specific Project (OP)	Assignment	Schedule	Stakeholder
1	SFHA Properties	2 Key Topics / Initiatives (A, B)	Disseminate flood information insert in utility bill including specific advertisement of CRS Activities 320, 360, and 440.	Floodplain Management Office Staff	Annually	N/A
2	Repetitive Loss Area Properties / SFHA Areas	2 Key Topics / Initiatives (A, E)	Presentation to HOAs in RL areas	Floodplain Management Office Staff	Annually (March – May)	N/A
3	Community At Large / SFHA Areas / RL Areas	0 Key Topics / Initiatives	Harris County Flood Control District Watershed informational video	Houston Permitting Center Communications / Social Media Admin	Annually, quarterly for digital signage	N/A

PROJECTS AND INITIATIVES

4	Community At Large	5 Key Topics / Initiatives(A-E)	Flood information presented at booth at city festivals and events	Floodplain Management Office Staff	Waterworks Festival – May Weather Ready Expo – August Trash Bash - March	N/A
5	Community At Large	5 Key Topics / Initiatives(A-E)	Participate in Texas Flood Awareness week	Floodplain Management Office Staff	Annually (May)	N/A

PROJECTS AND INITIATIVES CON'T

OP	Target Audiences	#Topics/ Message (see Table 2)	Specific Project (OP)	Assignment	Schedule	Stakeholder
6	Repetitive Loss Area Properties	2 Key Topics / Initiatives (A, B)	Disseminate flood information by letter, including specific advertisement of CRS Activities 320, 360, and 440.	Floodplain Management Office Staff	Annually	N/A
7	Builders, Contractors, Engineers	1 Key Topics / Initiatives (E)	Provide EC training webinar to City Staff reviewing ECs and outside surveyors and other professionals filling out ECs.	Floodplain Management Office Staff	Twice annually	N/A
8	Builders, Contractors, Engineers	2 Key Topics / Initiatives (B-E)	Presentation to construction industry associations	Floodplain Management Office Staff	Quarterly	N/A
9	Community at Large	5 Key Topics / Initiatives (A-E)	Attend Harris County Delinquent Property Tax Sale	Floodplain Management Office Staff	Monthly (first Tuesday)	N/A

PROJECTS AND INITIATIVES CON'T

10	Community at Large / SFHA Areas	1 Key Topic / Initiatives(A)	Signs placed along bayou trails and parks	Floodplain Management Office Staff / Houston Permitting Center Communications / Bayou Preservation Association	Permanent, once installed	Bayou Preservation Association
11	Community at Large	2 Key Topics / Initiatives (A, B)	Flood-related electronic newsletter	Floodplain Management Office Staff / Houston Permitting Center Communications	Annually (March – May)	N/A
12	Community at Large / RL Areas / SFHA	6 Key Topics / Initiatives (A-F)	Flood-related social media topics (rotating topics)	Houston Permitting Center Communications Social Media Administrators	Monthly	N/A

PROJECTS AND INITIATIVES CON'T

13	Repetitive Loss Area Properties / SFHA Areas	1 Key Topic / Initiatives (B)	Notice on electronic utility bill	Houston Public Works Communication / Floodplain Management Office Staff	Annually	N/A
14	Community at Large	6 Key Topics / Initiatives (A-F)	Informational fact sheets and other documents in City buildings	Floodplain Management Office Staff / Houston Permitting Center Communications	Brochures and fact sheets available year-round; larger displays rotating monthly (March – May)	N/A
15	Repetitive Loss Area Properties / SFHA Areas	8 Key Topics / Initiatives (A-H)	Purchase media advertisements	Houston Public Works Public Information Office / Floodplain Management Office Staff	Annually	N/A
16	Community at Large	8 Key Topics / Initiatives (A-H)	Appearances on local talk shows, radio shows, and newspapers	Houston Public Works Public Information Office / Floodplain Management Office Staff	Annually (April – May)	N/A

PROJECTS AND INITIATIVES CON'T

17	Real Estate and Insurance Agents	5 Key Topics / Initiatives (A-E)	Brochure for real estate agents should give to prospective buyers	Floodplain Management Office Staff/Houston Permitting Center Communications/ Real Estate Agents	Year round	Real Estate Agents
18	SFHA Areas	1 Key Topic / Initiative (B)	Advertisements placed on targeted Metro routes or stations	Houston Public Works Public Information Office /Floodplain Management Office Staff	Annually	N/A
19	RL Areas / SFHA Areas	1 Key Topic / Initiative (B)	Yard signs for Homeowners Associations	Floodplain Management Office Staff / Houston Permitting Center Communications/ HOAs	Annually	HOAs

OUTREACH PROJECTS - EXAMPLES

JAN. 2021 | VOL. 1



DID YOU KNOW?

HOUSTON'S FLOOD HAZARD AWARENESS NEWSLETTER

HALF OF ALL FLOODED PROPERTIES HAPPENED OUTSIDE THE FLOODPLAIN?



Even though you may not live in a defined floodplain, an adjacent or nearby storm sewer system or roadside ditch that has an inadequate capacity may cause localized flooding during a storm event. It is best to have the knowledge and awareness of flooding in Houston so that you will be prepared the next time it occurs.

Houston's Local Flood Hazard

Houston is unique in that its flat terrain, large amount of urban impervious cover (concrete), slowly-absorbing soil, and potential for thunderstorms, tropical storms, and hurricanes all combine to form ideal conditions for flooding. Due to its humid subtropical climate and proximity to the coast, Houston is susceptible to large amounts of rainfall that are often too great for its infrastructure and bayous to handle.

Houston has struggled with flooding since its founding.

The Importance of Flood Insurance

There is no way of predicting when and where the next flood will take place. Even though your property is not located in the floodplain, it is still possible that your property may incur damage caused by flooding.

Homeowners insurance does not cover flood damage; however, there is flood insurance backed by the National Flood Insurance Program (NFIP) that is unconditionally available to all residents in participating communities, even if the structure has received flood damage in the past. Flood insurance can be purchased from the NFIP or through your local insurance agent, keeping in mind that there is a 30-day waiting period before your flood insurance policy takes effect.

ASK YOUR INSURANCE AGENT ABOUT A PREFERRED RISK POLICY.



DON'T DELAY, BUY FLOOD INSURANCE TODAY

There is a 30-day waiting period before policies are effective.

FLOODPLAIN.HOUSTONTX.GOV 



DON'T DELAY BUY FLOOD INSURANCE TODAY

There is a 30-day waiting period before policies are effective.

FLOODPLAIN.HOUSTONTX.GOV 



City of Houston Utility Bill

713.371.1400
www.houstonwater.org

Don't delay, buy flood insurance today. There is a 30-day waiting period before policies are effective.

Manage your account online at www.houstonwater.org. Register for eBills, make a payment, and get water saving tips.

Customer Name: PUBLIC JOHN Q
Account Number: 1234-5678-9123
Service Address: 123 MAIN STREET
Bill Date: 04/20/2020
Total Amount Due: \$144.50

Billing Period		Summary of Charges	
Previous Read Date	03/16/2020	Previous Balance	\$60.77
Current Read Date	04/16/2020	Payment - Thank You	\$60.77
Previous Meter Reading	1182	Adjustments	\$0.00
Current Meter Reading	1192	Current Charges	\$144.50
Water Meter Consumption (per 1,000 gal.)		Total Amount Due	\$144.50



To avoid late fees or service interruption, please pay Total Amount Due by 05/10/2020.

DID YOU KNOW... Half of all flooded properties happened outside the floodplain! Ask your insurance agent about a preferred risk policy.

FLOODPLAIN.HOUSTONTX.GOV 

Account Number: 1234-5678-9123

TOTAL AMOUNT DUE:	\$144.50
Amount Paid:	
Due Date:	05/10/2020
Amount After 05/10/2020:	\$158.95

Return this portion with payment. Write account number on all checks.
Payable to: CITY OF HOUSTON

\$1 Gift to W.A.T.E.R. Fund

H00100000013P
PUBLIC JOHN Q
123 MAIN STREET
HOUSTON TX 77002-1234

CITY OF HOUSTON
P.O. BOX 1560
HOUSTON TX 77251-1560

12345678910123400000567800000910123

OUTREACH PROJECTS - EXAMPLES



TURN AROUND, DON'T DROWN.

It only takes 12 inches of fast-moving floodwater to wash away your vehicle.

FLOODPLAIN.HOUSTONTX.GOV



PRESERVE OUR FLOODPLAIN.

Don't allow grass clippings, oil, or other contaminants into storm sewer inlets.

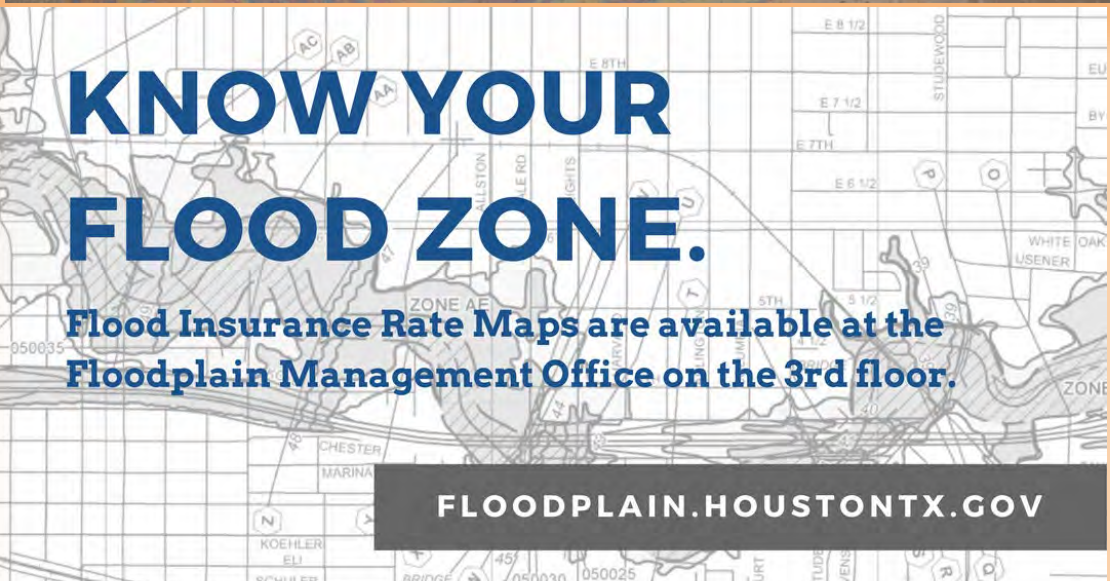
FLOODPLAIN.HOUSTONTX.GOV



FLOOD INSURANCE IS FOR EVERYONE.

One in four flood insurance claims occurs outside the mapped floodplain.

FLOODPLAIN.HOUSTONTX.GOV



KNOW YOUR FLOOD ZONE.

Flood Insurance Rate Maps are available at the Floodplain Management Office on the 3rd floor.

FLOODPLAIN.HOUSTONTX.GOV

OUTREACH PROJECTS - EXAMPLES



RATE CLASS DISCOUNT

CRS Class	Credit Points	Flood Insurance Premium Reduction	
		In SFHA	Outside SFHA
1	4,500+	45%	10%
2	4,000 - 4,499	40%	10%
3	3,500 - 3,999	35%	10%
4	3,000 - 3,499	30%	10%
5	2,500 - 2,999	25%	10%
6	2,000 - 2,499	20%	10%
7	1,500 - 1,999	15%	5%
8	1,000 - 1,499	10%	5%
9	500 - 999	5%	5%
10	0 - 499	0%	0%

COH

COMMUNITY RATING SYSTEM POINT STATUS

VERIFICATION STATUS	CREDITED POINTS	FUTURE POINTS
2015 Re-verification	Points received	2506
2021 Re-verification	Program for Public Information	Pending Re-verification
2021 Re-verification	<ul style="list-style-type: none"> • 2018 Chapter 9 Storm Water Design updated Ordinance • 2018 Chapter 19 Floodplain Ordinance updated 	Pending Re-verification
Prerequisites	<ul style="list-style-type: none"> • Watershed Master Plan • Floodplain Management Planning • Warning and Response 	Pending Class 4 Committee Meeting (494 points needed)

COH CHAPTER 19 FLOODPLAIN ORDINANCE

KEY PROVISIONS

	100-year Floodplain	500-year Floodplain
Elevation – New Structures (Flood-protection permitted for Non-residential Structures)	500-year +2 feet	500-year +2 feet
Elevation of Residential Additions 1/3 of footprint or smaller	100-year +1 foot	No requirement
Elevation of Residential Additions greater than 1/3 of footprint and all Non-residential Additions	500-year +2 feet	500-year + 2 feet

COH CHAPTER 19 FLOODPLAIN ORDINANCE

KEY PROVISIONS CON'T:

Substantial Improvement	500-year + 2 feet	No requirement
Substantial Damage	Applies	Does not apply
Mitigation	Compensate for fill placed below the 500-year flood elevation	Compensate for fill placed below the 500-year flood elevation No mitigation required if applicant demonstrates no impact to 100-year overland sheet flow
Parking, Access and Storage Enclosures	Flood openings required if below 500-year flood elevation	Flood openings required if below 500-year flood elevation
Conveyance	No change	Does not apply
No Impact	No change	Does not apply
Mitigation Recertification	All mitigation facilities permitted under new ordinance	All mitigation facilities permitted under new ordinance

CHALLENGES – ELEVATION CERTIFICATES

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number City of Houston/480296		B2. County Name Harris		B3. State Texas	
B4. Map/Panel Number 48201C0635	B5. Suffix M	B6. FIRM Index Date 11/15/19	B7. FIRM Panel Effective/ Revised Date 6/9/14	B8. Flood Zone(s) X	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) N/A
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input checked="" type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____					
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input checked="" type="checkbox"/> Other/Source: <u>NAVD 88 (2001 Adj)</u>					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					

Nearest BFE should be on the 500 yr. EC

Comments (including type of equipment and location, per C2(e), if applicable)

C2.e) AC pad
 *Per LOMR 15-06-0275P Effective Date: 11-13-15
 500 Year BFE = 94.3'

Always include the 500 yr. DFE in Section D Comment

COH ELEVATION CERTIFICATE TRAINING

FREE WEBINAR

WHAT

**Elevation Certificate
Training for City of
Houston
Professionals**

WHEN

**August 3, 2020
10-11:30 am**

ELEVATION CERTIFICATE
Important: Follow the instructions on pages 1-6.

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

SECTION A - PROPERTY INFORMATION		FOR INSURANCE COMPANY USE
A1. Building Owner's Name		Policy Number
 Floodplain Management Office Training		
A7. Building Diagram Number		
A6. For a building with a crawlspace or enclosure(s): a) Square footage of crawlspace or enclosure(s)		

WHY

Learn what common mistakes are made when completing Elevation Certificates and how to complete the Elevation Certificate for development in the 0.2% annual chance "500-year" floodplain.

CREDIT

This course is approved for one hour of continuing education credits for Certified Floodplain Manager®s through the Association of State Floodplain Managers.

HOW TO SIGN UP

Register at:
<https://coh-aug2020-ec-webinar.eventbrite.com>

QUESTIONS?

THANK YOU!

Contact Information

CRS Coordinator - Sandra.Deshotel@houstontx.gov

Floodplain Administrator – Choyce.Morrow@houstontx.gov

Floodplain Management Office – fmo@houstontx.gov or 832-394-8854



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