Presenter Information

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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
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

- Coastal Floods
- River Floods
- Flash Floods
- Urban Floods
- Pluvial Floods

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**

**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 pg. 28
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.
This covering and other louvers, blades, grills 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.

### Table 2-2 Flood Opening Coefficient of Discharge

<table>
<thead>
<tr>
<th>Opening Shape and Condition</th>
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<tbody>
<tr>
<td>All shapes, partially obstructed during design flood$^a$</td>
<td>0.20</td>
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<tr>
<td>Circular, unobstructed during design flood</td>
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<tr>
<td>Rectangular, long axis horizontal, short axis vertical, unobstructed during design flood</td>
<td>0.40$^c$</td>
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<tr>
<td>Square, unobstructed during design flood</td>
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<tr>
<td>Rectangular, short axis horizontal, long axis vertical, unobstructed during design flood</td>
<td>0.25$^d$</td>
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<tr>
<td>Other shapes, unobstructed during design flood</td>
<td>0.30</td>
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</table>

$^a$ 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.

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

$^d$ 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.

$^e$ 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.

*Also in FEMA TB-1 pg. 35
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 (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 (sq. ft.) / 200 = 6 total engineered flood vents required
Debris is a Fact of Flood: Issues with Non-Engineered Openings

ASCE 24 recommends AVOIDING these types of openings.

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

“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*
Designed, tested, & certified for performance

Designed and certified based on computations (TB1 and ASCE 24)

ICC-ES Certified: AC-364 (MOFV)

3-inch min. dimension for debris flow

316 Stainless Steel, Powder Coat Paint Options

ICC-ES Engineered Openings

DUAL-FUNCTION MODELS

INSULATED MODELS

Pour-in-Place Buck Models

Wood Wall Models

Garage Door Models

Multi-Frame Configuration Models
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.
Mechanically Operated Flood Vents
• 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.
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
Placement: Coverage, Two Exterior Walls, Height, Below BFE

More than 12”

Within 12”
Actuarial Rate
$9,000+ Premium

Subsidized Rate
$2,038 Premium
After

NEW RATING AFTER INSTALLATION OF FLOOD VENTS
“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!”

**NFIP Flood Insurance Premium Results**

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<td>Old Premium</td>
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<tr>
<td>Retrofit Cost</td>
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<tr>
<td>New Premium</td>
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75% REDUCTION
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

- 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.
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

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

Solutions for terminating against a wall
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
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

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 12 h.
Goal to make a building watertight, impermeable to floodwaters.

NFIP allows dry floodproofing in non-residential buildings only.


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 24-14

ASCE 7-16

ASCE 24 & 7, International Building Code (IBC)

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.

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)
Planning: What to consider?

- Warning time, Safety & Access
- Flood Velocities, Depths, and Debris
- Frequency
- Cost & Liability

Emergency Operation Plan

- Establish the chain of command & responsibilities
- Procedure for notifying necessary parties
- A list of specific duties & location of all dry floodproofing materials
- Evacuation plan with and without duties
- Annual training drills with community officials
- The plan is required to ensure that the floodproofing components will operate properly under all conditions, including a power failure which is often seen during floods.
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
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.

<table>
<thead>
<tr>
<th>BIDDING</th>
<th>PRODUCTS</th>
<th>INSTALL</th>
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<tr>
<td>Project Review and Design</td>
<td>Aluminum Flood Logs</td>
<td>Product Specific Installation</td>
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<tr>
<td>Accurate Takeoffs and Product Quotes</td>
<td>Flood Panels</td>
<td>Complete Installation with Quick Turnarounds</td>
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<tr>
<td>Value Engineering</td>
<td>Perimeter Systems</td>
<td>On-site Visits and Deployment Training</td>
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<tr>
<td>Dry Floodproofing Certification</td>
<td>Engineered Flood Vents</td>
<td>O+M Manual and Emergency Management Plan</td>
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<td>Passive Systems</td>
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<td></td>
<td>Floodproof Glass</td>
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</tr>
</tbody>
</table>

**FLOODPROOFING TAKEOFFS**
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

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>PLANK WEIGHT</th>
<th>PLANK LENGTH</th>
<th>SYSTEM HEIGHT</th>
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<tbody>
<tr>
<td>Galvanized Steel Posts, Aluminum Planks</td>
<td>Slb/ft</td>
<td>Max 20'</td>
<td>Max 20'</td>
</tr>
</tbody>
</table>

Holman Field, St. Paul Downtown Airport

Waterfront Application

Angle Braces
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

Tooless Deployment
Standard Door Flood Barriers

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

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

- Structural Webbings
- Bolt Storage Bag
- Lifting Handle
- Water Barrier Layer
- Anchor Bolts
- Sacrificial Bladder Layer
- Compression Feature
- Gasket Protection Feature
- Ground Seal
Standard Door Flood Barriers

Ground Gasket Compression Feature

Bottom Gasket Protection Feature
Point-of-Use Flood Barriers: Side-Deployed Flexible Wall
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
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
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
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.

FLOOD WALLS
CONCEPTS TO INSPIRE
Considerations for Floodproofing Strategy

Don’t let the tip of the iceberg distract you from what is below the surface

Acquisition Cost

Operational Costs

Lost Revenue

Maintenance & Inspection

Annual Deployments

Closure Time
Before & after event, training, annual deployments

Operational Costs

Deductible

Damages

Equipment Replacement

Training

Storage

Before & after event, training, annual deployments
Thank You For Your Time!

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AIA COURSE TITLE: FLOODPLAIN DESIGN, CONSTRUCTION, AND IMPACTS ON FLOOD INSURANCE
AIA COURSE NUMBER: SV0004
AIA CREDIT: 1 HSW
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Communities Adopting Flood Re-inspections into Ordinance

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.

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

Katrina - 2005
$1.9 billion

Sandy - 2012
$3.3 billion

Harvey - 2017
$3.3 billion
Policy Changes

**APR 1, 2015**

- $25 Surcharge Primary
- $250 Non-Primary

9% increase for everyone

**ACTUARIAL RATES**

1. Non-Primary Residences
2. Subsidized Rates
3. Business Properties
4. Severe Repetitive Loss
Private Flood Insurance Quotes
## Private vs NFIP

<table>
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<tr>
<th>Feature</th>
<th>NFIP</th>
<th>PRIVATE</th>
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<td>Personal Property &amp; Basements</td>
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<td>Effective in 10 Days</td>
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<td>20–50% Cost Savings</td>
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<td>Earthquakes &amp; Eruptions</td>
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Questions or Misconceptions

It’s not affordable
Can they pay my claim?
Will my mortgage lender accept it?
Statistics

Built - 1952    Zone – A13    BFE – 460

Elevated – 1992 (460.59)    Residence – Primary

Building Diagram - 7 Unfinished

$2,038

NFIP Premium
Agent Errors

No Flood Vents

Mislabeled 1920

Substantial improvement was on 06/01/1920

No Flood Vents

Mislabeled 1920
Surveyor Errors

Should be Diagram 7

Should be 968 ft²
## Elevation Certificate

### SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Peoria</td>
<td></td>
<td>IL</td>
<td>170536</td>
<td></td>
<td></td>
<td>February 1, 1980</td>
<td>A13</td>
<td>460.0</td>
</tr>
</tbody>
</table>

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

### SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

**a)** Top of bottom floor (including basement, crawlspace, or enclosure floor) ______ feet ______ meters (Puerto Rico only)

**b)** Top of the next higher floor ______ feet ______ meters (Puerto Rico only)

**c)** Bottom of the lowest horizontal structural member (V Zones only) ______ feet ______ meters (Puerto Rico only)

**d)** Attached-garage (top of slab) AUXILIARY GARAGE STRUCTURE ______ feet ______ meters (Puerto Rico only)

**e)** Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) ______ feet ______ meters (Puerto Rico only)

**f)** Lowest adjacent (finished) grade next to building (LAG) ______ feet ______ meters (Puerto Rico only)

**g)** Highest adjacent grade below building ______ feet ______ meters (Puerto Rico only)

**h)** Lowest adjacent (finished) grade below building ______ feet ______ meters (Puerto Rico only)

- **Check the measurement used.**

Without Flood Openings - **9 RATING**

Exempt Unfinished Level - **+1 RATING**
Before

Actuarial Rates
$9,000+ Premium

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

+1 RATING
Higher Floor 460.69’
Insulated Smart Vents

BFE 460’
Vents are installed in a 16” x 8” hole, the opening left when (1) CMU block is removed.
New Premium
Retrofit Cost - $1,200

WRIGHT Flood

POLICY INFORMATION
Policy Number: 12 1151210418-00
Policy Period: 01/09/2016 to 01/09/2016
Agency Number: 734979
Agency: RISK REDUCTION PLUS GROUP INC
Agency Phone: (877) 841-8386

Application Date: 11/05/2015
Premium paid by: Lender
Insured Name: ROBERT WAGNER
Property Address: 4218 N GALENA RD
PEORIA, IL 61614-9847
Insured's Phone: (309) 251-8732

Current Flood Zone: A12
Zone Determination: Yes
Current Community Number: 170206
Certificate #: 05080712

ZONE INFORMATION
Current Map Panel Number: 0615-8
Determination #: 00040702

RATING INFORMATION
Building Occupancy: Single Family
Number of Floors: Three or More Floors
Position/Enclosure: Enclosure

COVERAGE / PREMIUM INFORMATION
Coverage: Limits
Deductible: $1,250.00
Premises: $440.00
Contents: $0.00

PAYMENT INFORMATION
Payment Method: Check
Name of Check Holder: Lender
Check #: 10025914
Check Date: 10/22/2014

Total Premium: $2,038

75%

$511

$2,038
“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

- Buoyancy Force (crawl space)
- Lateral Force
- Saturated Soil
- Hydrostatic Pressure
- Increased Buoyancy Force (subgrade space)
An automatic opening that protects your foundation by allowing bi-directional water flow which equalizes 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.
Ocean City, NJ
CASE STUDY
Before

1 – Inadequate flood venting
1 – Inadequate flood venting
Statistics

Built - 1952  Zone - AE  BFE – 9’

Residence – Primary  Building Diagram - 8

$2,977

NFIP Premium
New Premium
RETROFIT COST - $3,500

$2,977
$547
82%
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
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
# PROGRAM FOR PUBLIC INFORMATION (PPI) PLAN

**THE COH**
- IDENTIFY
- PREPARE
- IMPLEMENT
- MONITOR

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

<table>
<thead>
<tr>
<th>Topic</th>
<th>Outcome</th>
<th>Related CRS Priority Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Know your flood risk</td>
<td>Increased flood information inquiries to Houston Public Works</td>
<td>1. Check the online maps at GIMS to see if your property is in the floodplain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Find out if your property is subject to flooding. Contact FMO at <a href="mailto:fmo@houstonTX.gov">fmo@houstonTX.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Find out if you are in a mapped flood zone. Visit <a href="https://msc.fema.gov">https://msc.fema.gov</a>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Find out about historical flooding conditions by visiting <a href="http://floodplain.houstonTX.gov">http://floodplain.houstonTX.gov</a></td>
</tr>
<tr>
<td>B. Insure your property for your flood hazard</td>
<td>Increase number of flood policies community-wide</td>
<td>1. Don't delay, buy flood insurance today. There is a 30-day waiting period before policies are effective.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Purchase flood insurance to protect your assets. Contact an insurance agent to get covered.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Did you know half of all flooded properties happened outside the floodplain? Ask your insurance agent about a preferred risk policy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Are you renting? Get contents-only coverage to protect your assets. Contact an insurance agent to get covered.</td>
</tr>
<tr>
<td>TOPICS</td>
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</tr>
<tr>
<td><strong>C. Protect people from the flood hazard</strong></td>
<td><strong>Reduce number of water rescues, police citations for ignoring barricades</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 1. Go to [https://www.harriscountyfws.org/](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. |
| **D. Protect your property from the flood hazard** | **Increase number of applications for flood protection projects** |
| 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. |
<table>
<thead>
<tr>
<th>Topic</th>
<th>Outcome</th>
<th>Related CRS Priority Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Build responsibly</td>
<td>Reduce number of building department citations</td>
<td>1. If you are building in the floodplain, find out what permits are required at <a href="http://www.houstonpermittingcenter.org">www.houstonpermittingcenter.org</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Be aware of substantial improvement rules. Contact FMO.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Hire a licensed surveyor, architect, or engineer to complete an elevation certificate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. You must get a permit to bring fill onto a property in the City-regulated floodplain. Visit FMO to obtain your permit.</td>
</tr>
<tr>
<td>F. Protect natural floodplain functions</td>
<td>Improved water quality of rivers, wetlands, streams</td>
<td>1. Don’t trash the bayous and rivers. Trash washes back into a community during a flood storm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Lend a hand, take care of the land. Call 3-1-1 to report dumping in the floodplain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Don’t pollute bayous and rivers. Houston gets its drinking water from surface water.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Stay on the path when visiting a bayou park. Our floodplains are critical habitat for wildlife.</td>
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<tr>
<td>INITIATIVES</td>
<td></td>
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<tr>
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</tr>
<tr>
<td><strong>G. Hurricane Evacuation</strong></td>
<td>Minimize loss of life in hurricanes and evacuations</td>
<td></td>
</tr>
<tr>
<td>2. Sign up for AlertHouston and stay informed about hurricane evacuation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Know your evacuation route. Visit OEM website to download your evacuation guide. <a href="https://www.houstonoem.org/preparedness-are-you-ready/">https://www.houstonoem.org/preparedness-are-you-ready/</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Only evacuate when directed by emergency management officials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H. Stormwater Management</strong></td>
<td>Increased participation in clean out projects; increased participation in Adopt-a-Drain program and Protect the Pipes campaign</td>
<td></td>
</tr>
<tr>
<td>1. Steer clear of flood-prone streets. Roadways are designed to flood.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Only rain down the drain. Don’t dispose of anything down the drain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Adopt a drain. Clear debris from storm drains to prevent flooding. <a href="https://mycity.houstontx.gov/adopta/">https://mycity.houstontx.gov/adopta/</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Give a hoot, don’t pollute. Call 3-1-1 to report stormwater pollution violations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## PUBLIC INFORMATION EFFORTS

<table>
<thead>
<tr>
<th>Organization</th>
<th>Project</th>
<th>Subject Matter</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floodplain Management Office</td>
<td>Insert in water bill to SFHA areas and letter to Repetitive Loss property residents</td>
<td>Various flood-related topics, including specific advertisement of CRS Activities 320, 360, and 440.</td>
<td>Annually</td>
</tr>
<tr>
<td>Floodplain Management Office</td>
<td>Update flood information in public library</td>
<td>Various flood-related topics</td>
<td>As needed</td>
</tr>
<tr>
<td>Floodplain Management Office</td>
<td>Flood information inserted in water utility bill</td>
<td>Various flood-related topics</td>
<td>Annually</td>
</tr>
<tr>
<td>Engineering Dept./Floodplain Management office home page</td>
<td>Disseminate comprehensive flood information</td>
<td>Various flood-related topics</td>
<td>Year-round</td>
</tr>
<tr>
<td>Floodplain Management Office</td>
<td>Flood Awareness Week</td>
<td>Promote flood mitigation and reducing flood risk, flood insurance availability, demonstrate flood model to Houston-area elementary students</td>
<td>Annually or Bi-Annually</td>
</tr>
<tr>
<td>Floodplain Management Office</td>
<td>Disseminate post-flood response packet to residents utilizing brochure, flyers, permit process</td>
<td>Educate residents regarding need for permits to rebuild, flood safety tips, promote purchase of flood insurance</td>
<td>Annually</td>
</tr>
<tr>
<td>City website / Houston Public Works</td>
<td>Promote natural floodplain area protection</td>
<td>“Only water goes down the drain”, hazards of dumping debris and home-based chemicals in drains</td>
<td>Year-round</td>
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<td>-------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Floodplain Management Office</td>
<td>Work with public broadcasting channel to promote flood information</td>
<td>Various flood-related topics</td>
<td>Annually</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>Ready Harris</td>
<td>Hurricane Preparedness</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>Ready Harris</td>
<td>Flood Risk Reduction information by Channels and Bayous Watershed</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>Harris County Modeling, Assessment and Awareness Project (MAAPnext)</td>
<td>New mapping methodologies and technologies that will provide better understanding of flood risks</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>Flood Warning System FWS</td>
<td>Measures rainfall amounts and monitors water levels in bayous and major streams on a real-time* basis to inform you of dangerous weather conditions.</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>Home Buyout Program</td>
<td>Restores floodplain through buyouts</td>
<td>Year-round</td>
</tr>
<tr>
<td>Organization (cue)</td>
<td>Program/Link (cue)</td>
<td>Strategy (cue)</td>
<td>Frequency</td>
</tr>
<tr>
<td>-------------------------------------------</td>
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</tr>
<tr>
<td>Houston- Galveston Area Council</td>
<td>Home Buyout Program</td>
<td>Regional Hazard Mitigation Planning</td>
<td>Year-round</td>
</tr>
<tr>
<td>H-GAC / Federal Emergency Management Association</td>
<td>Hazard Mitigation Assistance Guide</td>
<td>Hazard Mitigation</td>
<td>Year-round</td>
</tr>
<tr>
<td>Community Impact Newspaper (Bayou Preservation Assn)</td>
<td>Thinking Outside of the Box for a Flood Resistant Houston – Flood Resistance Series</td>
<td>Flood Resistance</td>
<td>Year-round</td>
</tr>
<tr>
<td>Realtor.com</td>
<td>App - Flood Risk Data for Homes</td>
<td>Flood risk of a location when thinking about home purchase</td>
<td>Year-round</td>
</tr>
<tr>
<td>Houston Properties</td>
<td>Guide to Houston’s Best Neighborhoods - Houston Flooding Guide</td>
<td>Houston flood zones</td>
<td>Year-round</td>
</tr>
<tr>
<td>American Red Cross</td>
<td>Flood Safety Preparedness</td>
<td>Flood safety</td>
<td>Year-round</td>
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<tr>
<td>Organization</td>
<td>Project</td>
<td>Subject Matter</td>
<td>Frequency</td>
</tr>
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<td>-------------------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>96 Community Engagement Meetings</td>
<td>Meetings to discuss flood reduction projects by watershed</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County Engineering Dept</td>
<td>Regulations of Harris County, Texas for the Approval and Acceptance of Infrastructure Manual</td>
<td>Infrastructure regulations effective 9/29/2020</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County</td>
<td>Community Flood Resilience Task Force</td>
<td>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.</td>
<td>3 Virtual Meetings</td>
</tr>
<tr>
<td>Harris County Flood Control District</td>
<td>Customer Satisfaction Survey</td>
<td>Feedback from community regarding HCFCID</td>
<td>As needed</td>
</tr>
<tr>
<td>Harris County Engineering Dept</td>
<td>Harris County Residential Permitting Brochure</td>
<td>Residential permitting</td>
<td>Year-round</td>
</tr>
<tr>
<td>Harris County Engineering Dept</td>
<td>Harris County Residential Building Code Standards</td>
<td>Building codes</td>
<td>Year-round</td>
</tr>
</tbody>
</table>
# PROJECTS AND INITIATIVES

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

<table>
<thead>
<tr>
<th></th>
<th>Community At Large</th>
<th>5 Key Topics / Initiatives(A-E)</th>
<th>Flood information presented at booth at city festivals and events</th>
<th>Floodplain Management Office Staff</th>
<th>Waterworks Festival – May Weather Ready Expo – August Trash Bash - March</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>OP</td>
<td>Target Audiences</td>
<td>#Topics/Message (see Table 2)</td>
<td>Specific Project (OP)</td>
<td>Assignment</td>
<td>Schedule</td>
<td>Stakeholder</td>
</tr>
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</tr>
<tr>
<td>6</td>
<td>Repetitive Loss Area Properties</td>
<td>2 Key Topics / Initiatives (A, B)</td>
<td>Disseminate flood information by letter, including specific advertisement of CRS Activities 320, 360, and 440.</td>
<td>Floodplain Management Office Staff</td>
<td>Annually</td>
<td>N/A</td>
</tr>
<tr>
<td>7</td>
<td>Builders, Contractors, Engineers</td>
<td>1 Key Topics / Initiatives (E)</td>
<td>Provide EC training webinar to City Staff reviewing ECs and outside surveyors and other professionals filling out ECs.</td>
<td>Floodplain Management Office Staff</td>
<td>Twice annually</td>
<td>N/A</td>
</tr>
<tr>
<td>8</td>
<td>Builders, Contractors, Engineers</td>
<td>2 Key Topics / Initiatives (B-E)</td>
<td>Presentation to construction industry associations</td>
<td>Floodplain Management Office Staff</td>
<td>Quarterly</td>
<td>N/A</td>
</tr>
<tr>
<td>9</td>
<td>Community at Large</td>
<td>5 Key Topics / Initiatives (A-E)</td>
<td>Attend Harris County Delinquent Property Tax Sale</td>
<td>Floodplain Management Office Staff</td>
<td>Monthly (first Tuesday)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Community at Large / SFHA Areas</td>
<td>1 Key Topic / Initiatives (A)</td>
<td>Signs placed along bayou trails and parks</td>
<td>Floodplain Management Office Staff / Houston Permitting Center Communications / Bayou Preservation Association</td>
<td>Permanent, once installed</td>
<td>Bayou Preservation Association</td>
</tr>
<tr>
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<td>-----------------------------</td>
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<td>--------------------------------</td>
</tr>
<tr>
<td>10</td>
<td>Community at Large</td>
<td>2 Key Topics / Initiatives (A, B)</td>
<td>Flood-related electronic newsletter</td>
<td>Floodplain Management Office Staff / Houston Permitting Center Communications</td>
<td>Annually (March – May)</td>
<td>N/A</td>
</tr>
<tr>
<td>11</td>
<td>Community at Large / RL Areas / SFHA</td>
<td>6 Key Topics / Initiatives (A-F)</td>
<td>Flood-related social media topics (rotating topics)</td>
<td>Houston Permitting Center Communications / Social Media Administrators</td>
<td>Monthly</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Projects and Initiatives Con’t</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>13</td>
<td>Repetitive Loss Area Properties / SFHA Areas</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Key Topic / Initiatives (B)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Notice on electronic utility bill</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Houston Public Works Communication / Floodplain Management Office Staff</td>
<td></td>
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<tr>
<td></td>
<td>Annually</td>
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<tr>
<td>14</td>
<td>Community at Large</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>6 Key Topics / Initiatives (A-F)</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Informational fact sheets and other documents in City buildings</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Floodplain Management Office Staff / Houston Permitting Center Communications</td>
<td></td>
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<tr>
<td></td>
<td>Brochures and fact sheets available year-round; larger displays rotating locations monthly (March – May)</td>
<td></td>
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<tr>
<td>15</td>
<td>Repetitive Loss Area Properties / SFHA Areas</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 Key Topics / Initiatives (A-H)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Purchase media advertisements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Houston Public Works Public Information Office / Floodplain Management Office Staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Community at Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 Key Topics / Initiatives (A-H)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Appearances on local talk shows, radio shows, and newspapers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Houston Public Works Public Information Office / Floodplain Management Office Staff</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Annually (April – May)</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**NOTES:**
- **N/A** indicates information not available or not applicable.
- **Annually** indicates ongoing activities throughout the year.
- **Annually (April – May)** indicates activities specific to a particular season or period.
## 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

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

Customer Name: [Name]
Account Number: 1234-5678-9123
Service Address: 123 MAIN STREET

Due Date: 01/15/2023

Amount Due: $123.45

City of Houston

Account Number: 1234-5678-9123

TOTAL AMOUNT DUE: $123.45

Service Address: 123 MAIN STREET

Due Date: 01/15/2023

Amount Due: $123.45

City of Houston

Account Number: 1234-5678-9123

TOTAL AMOUNT DUE: $123.45

Service Address: 123 MAIN STREET

Due Date: 01/15/2023

Amount Due: $123.45

City of Houston
OUTREACH PROJECTS - EXAMPLES

TURN AROUND, DON'T DROWN.
It only takes 12 inches of fast-moving floodwater to wash away your vehicle.

FLOOD INSURANCE IS FOR EVERYONE.
One in four flood insurance claims occurs outside the mapped floodplain.

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

KNOW YOUR FLOOD ZONE.
Flood Insurance Rate Maps are available at the Floodplain Management Office on the 3rd floor.
OUTREACH PROJECTS - EXAMPLES
<table>
<thead>
<tr>
<th>CRS Class</th>
<th>Credit Points</th>
<th>Flood Insurance Premium Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In SFHA</td>
</tr>
<tr>
<td>1</td>
<td>4,500+</td>
<td>45%</td>
</tr>
<tr>
<td>2</td>
<td>4,000 - 4,499</td>
<td>40%</td>
</tr>
<tr>
<td>3</td>
<td>3,500 - 3,999</td>
<td>35%</td>
</tr>
<tr>
<td>4</td>
<td>3,000 - 3,499</td>
<td>30%</td>
</tr>
<tr>
<td>5</td>
<td>2,500 - 2,999</td>
<td>25%</td>
</tr>
<tr>
<td>6</td>
<td>2,000 - 2,499</td>
<td>20%</td>
</tr>
<tr>
<td>7</td>
<td>1,500 - 1,999</td>
<td>15%</td>
</tr>
<tr>
<td>8</td>
<td>1,000 - 1,499</td>
<td>10%</td>
</tr>
<tr>
<td>9</td>
<td>500 - 999</td>
<td>5%</td>
</tr>
<tr>
<td>10</td>
<td>0 - 499</td>
<td>0%</td>
</tr>
</tbody>
</table>
### COMMUNITY RATING SYSTEM POINT STATUS

<table>
<thead>
<tr>
<th>VERIFICATION STATUS</th>
<th>CREDITED POINTS</th>
<th>FUTURE POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Re-verification</td>
<td>Points received</td>
<td>2506</td>
</tr>
<tr>
<td>2021 Re-verification</td>
<td>Program for Public Information</td>
<td>Pending Re-verification</td>
</tr>
</tbody>
</table>
| 2021 Re-verification    | • 2018 Chapter 9 Storm Water Design updated Ordinance  
• 2018 Chapter 19 Floodplain Ordinance updated   | Pending Re-verification                                 |
| Prerequisites           | • Watershed Master Plan                             
• Floodplain Management Planning                      
• Warning and Response                                    | Pending Class 4 Committee Meeting (494 points needed)    |
### COH CHAPTER 19 FLOODPLAIN ORDINANCE

#### KEY PROVISIONS

<table>
<thead>
<tr>
<th></th>
<th>100-year Floodplain</th>
<th>500-year Floodplain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation – New Structures</td>
<td>500-year +2 feet</td>
<td>500-year +2 feet</td>
</tr>
<tr>
<td>(Flood-protection permitted for Non-residential Structures)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation of Residential Additions 1/3 of footprint or smaller</td>
<td>100-year +1 foot</td>
<td>No requirement</td>
</tr>
<tr>
<td>Elevation of Residential Additions greater than 1/3 of footprint and all Non-residential Additions</td>
<td>500-year +2 feet</td>
<td>500-year +2 feet</td>
</tr>
</tbody>
</table>
# COH CHAPTER 19 FLOODPLAIN ORDINANCE

## KEY PROVISIONS CON’T:

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


**CHALLENGES – ELEVATION CERTIFICATES**

<table>
<thead>
<tr>
<th>B1. NFIP Community Name &amp; Community Number</th>
<th>B2. County Name</th>
<th>B3. State</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Houston/480296</td>
<td>Harris</td>
<td>Texas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B4. Map/Panel Number</th>
<th>B5. Suffix</th>
<th>B6. FIRM Index Date</th>
<th>B7. FIRM Panel Effective/Revised Date</th>
<th>B8. Flood Zone(s)</th>
<th>B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48201C0635</td>
<td>M</td>
<td>11/15/19</td>
<td>6/9/14</td>
<td>X</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- **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/Source:

- **B11.** Indicate elevation datum used for BFE in Item B9:
  - NGVD 1929
  - NAVD 1988
  - Other/Source: NAVD 88 (2001 Adj)

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

- **Comments (including type of equipment and location, per C2(e), if applicable):**
  
  C2.e) AC pad
  *Per LOMR 15-08-0275P Effective Date: 11-13-15
  500 Year BFE = 94.3"

- **Nearest BFE should be on the 500 yr. EC**

- **Always include the 500 yr. DFE in Section D Comment**
FREE WEBINAR

WHAT
Elevation Certificate Training for City of Houston Professionals

WHEN
August 3, 2020
10-11:30 am

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