Emergency Management
NC DEPARTMENT OF PUBLIC SAFETY

Living on Barrier Islands

A Workshop for Real Estate Professionals

NFIP Overview

Developing in Compliance w/ the NFIP

September 19, 2023

Eryn Futral, AICP, CFM, CZO

NFIP Eastern Branch Planner

NC Emergency Management, Hazard Mitigation Support Program

EMAP Accredited

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NATIONAL FLOOD INSURANCE PROGRAM

- Identifies & maps flood hazard areas
- Provides a framework for floodplain management regulations
- Makes flood insurance available in Communities that participate in the NFIP

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NFIP Goals

- Reduce loss of life & property
- Reduce rising disaster relief costs
- Increase importance of hazard mitigation (flood resistant construction, guide future development, & prohibit development in floodplains that would increase flood levels)
- Decrease taxpayer-funded disaster costs
- Make Federally backed insurance coverage available to property owners
- Restore & protect natural resources & functions of floodplains

EMAP Accredited

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Community Participation in the NFIP

A **VOLUNTARY** program based on a mutual agreement between the Federal government and the local community:

In exchange for adopting, implementing and enforcing a Floodplain Management Ordinance

- Federally-backed flood insurance is made available to property owners throughout the community.
- Federal disaster assistance and mitigation grant programs made available.

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Role of NFIP Participating Community

- Review floodplain development permit applications and issue/deny floodplain development permits
- **Inspect ALL development to ensure compliance with local ordinances**
- Maintain floodplain development records
- Assist in preparation & revision of floodplain maps
- Help citizens obtain information on flood hazards, floodplain map data, flood insurance, & proper construction measures

What is Floodplain Development?

"Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."

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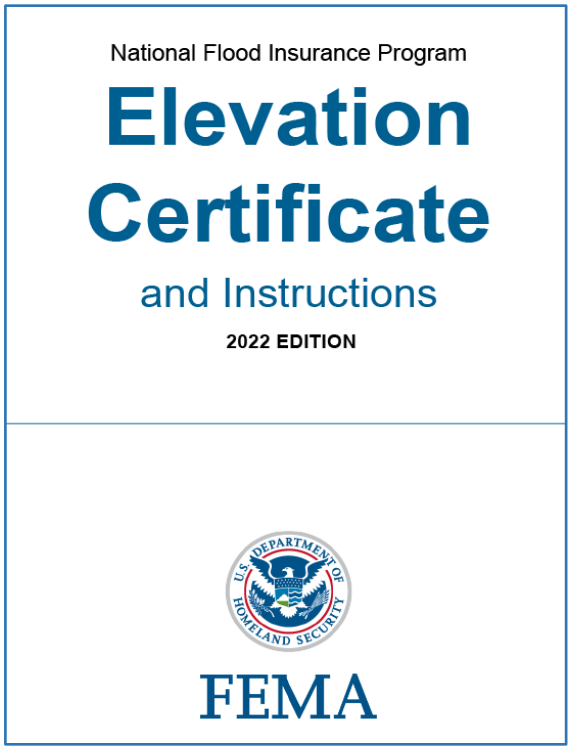

Elevation Certificate Form

- Verify Regulatory Compliance
- Supporting documentation for map revision & amendment applications
- Provide better/recent data to insurance companies to see if a better rate is available

- **NOTE:** Data collected on this form is for the construction & utility service to a single STRUCTURE only – not the lot or other improvements.

The Community's EC Review

Community Officials MUST review Elevation Certificate's (ECs) before accepting them to ensure:

- **Completeness**
- **Reasonableness/Accuracy**
- **Compliance**

NFIP requires the Finished Construction EC for all:

- **New Construction**
- **Additions**
- **Substantial Improvements**

To structures located in the Special Flood Hazard Area.

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Question???????

A property owner needs a copy of the elevation certificate for their structure.

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Answer…

- ✓ The local permitting jurisdiction
- ✓ Surveyor
- ✓ Previous/Current Owner
- ✓ Insurance Agent

State NFIP staff do NOT have a database of ECs.

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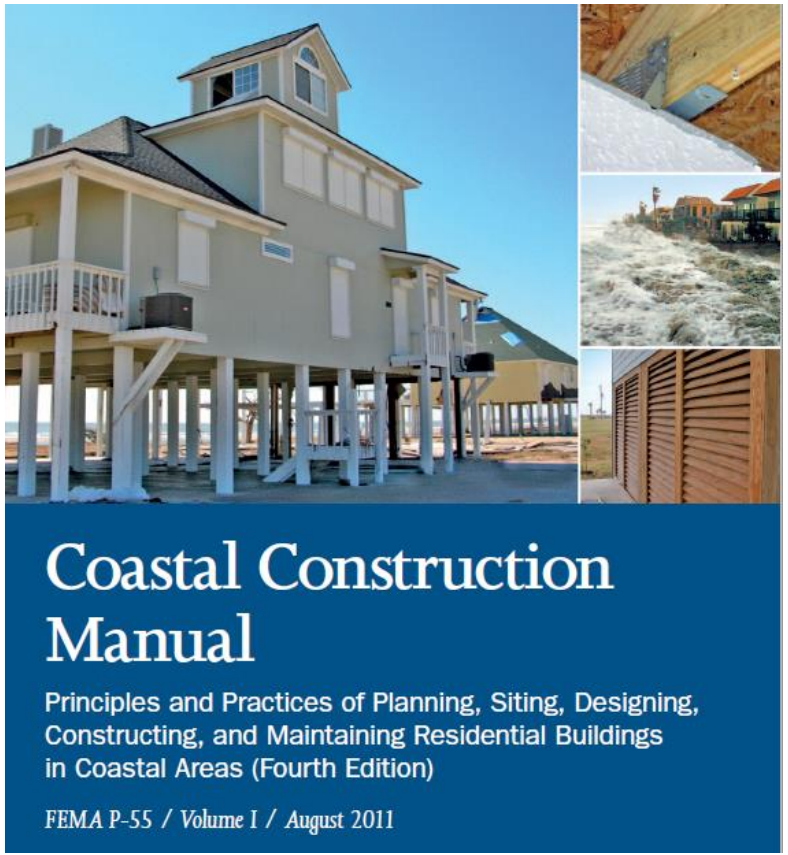
Development Standards



Mitigation Measures

Regulatory Flood Protection Elevation (RFPE)

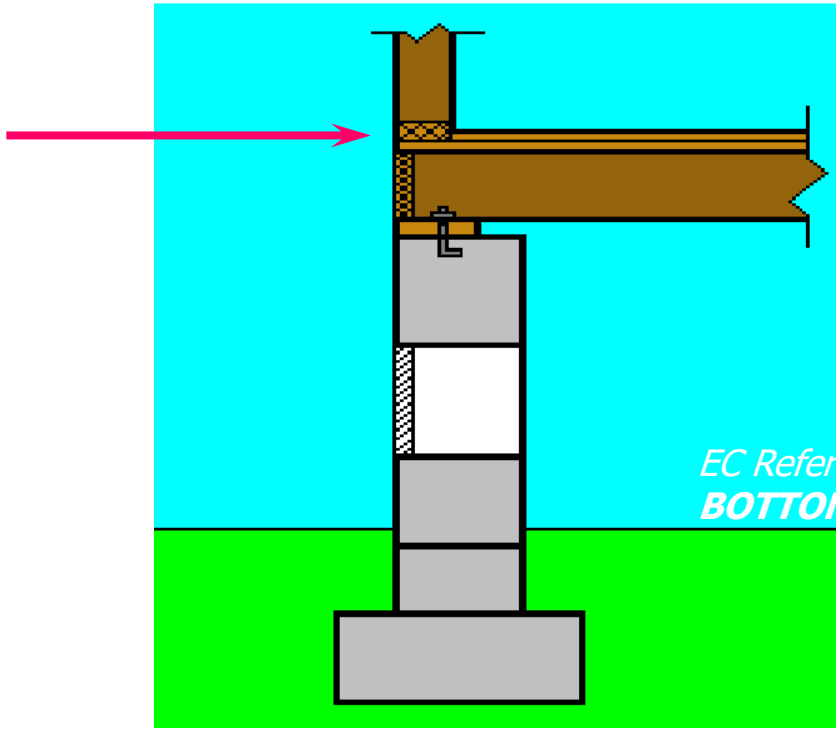
- Base Flood Elevation PLUS Freeboard (BFE + Freeboard)
- Freeboard – the elevation required by a local jurisdiction above the base flood elevation
- Higher standard adopted by the local jurisdiction
  - Higher level of protection for structures
  - Community Rating System (CRS) Points = increased flood insurance discounts (in the SFHA and out)

Example: BFE of 9’ + 2’ local freeboard =

RFPE of 11’

Lowest Floor in ZONE A, AE, AH, & AO

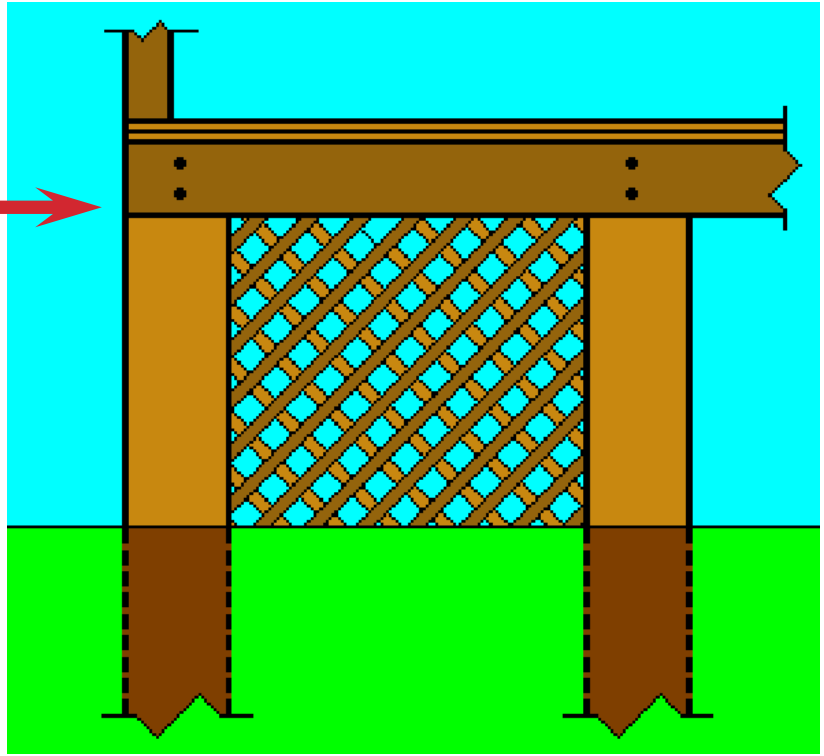
The lowest floor is measured at the top of the sub-floor, slab or grade for regulatory & flood insurance purposes




A-Zones: 1st finished floor elevation

Lowest Floor in ZONE V, VE & Coastal A

Bottom of the lowest horizontal structural member supporting the lowest floor




Coastal A & V-Zones:
Lowest Horizontal
Structural Member
OBAR

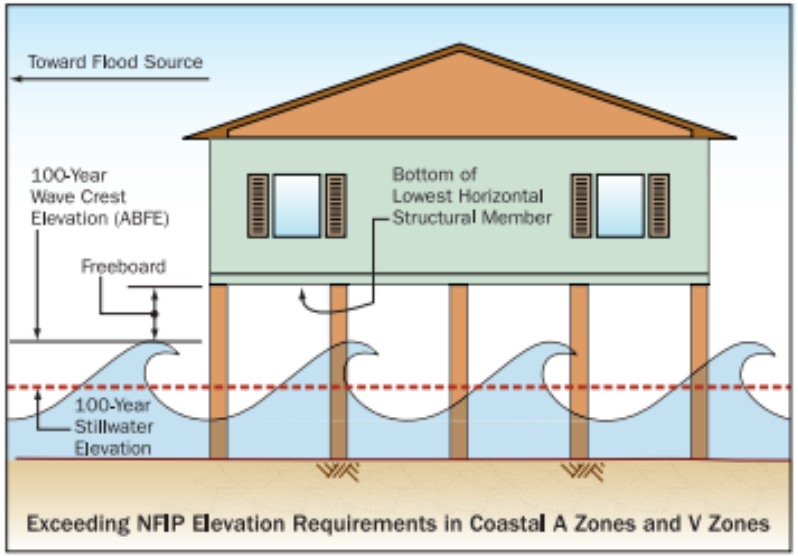
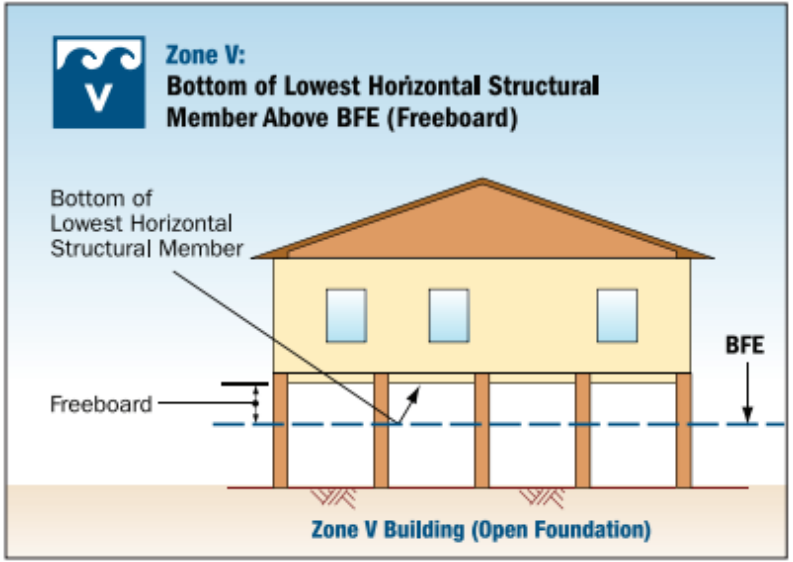


Figure 7. Recommended construction in Coastal A zones and V zones.



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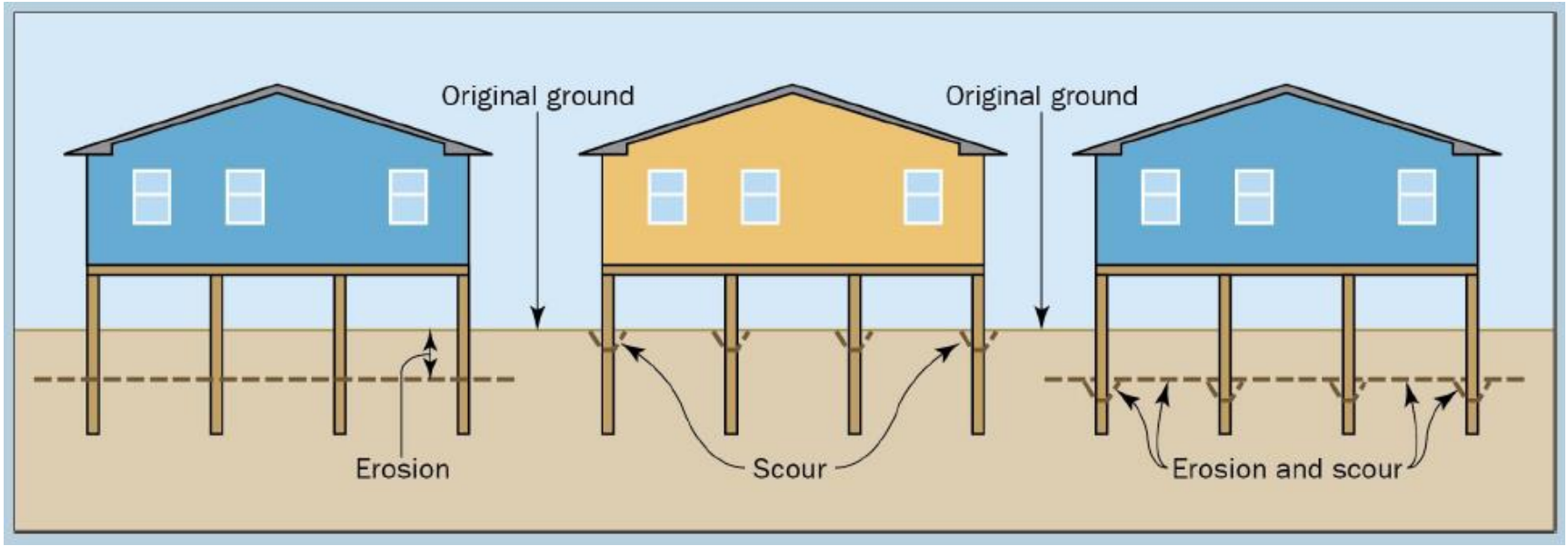

Scour and Erosion

Figure 1: Three neighboring buildings with varying degrees of elevation and damage on Fort Myers Beach, Florida, after Hurricane Ian. The right-most building has the lowest elevation of the three and the most damage to the lower levels, whereas the middle building has the highest elevation and minimal damage to the lower levels.

Bonita Springs, FL
Hurricane Ian

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Bolivar Peninsula, TX 2008

Figure 2. Bolivar Peninsula, TX, V-zone house constructed with the lowest floor (bottom of floor beam) at the BFE (dashed line). The estimated wave crest level during Ike (solid line) was 3 to 4' above the BFE at this location.

BUT WAIT…..

Where do the regulations and guidance come from?

- Research following past events
- Field investigations post event
- Collaboration among engineers, researchers, home builders, Institute for Business and Home Safety, International Code Council, National Association of Home Builders, US Dept. of Housing and Urban Development, local community officials, etc.

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Protecting Existing Structures

Purchase Flood Insurance

Lower Your Flood Risk

- ✓Elevate utilities (include duct work)
- ✓Install flood openings
- ✓Elevate building
- ✓Flood proof (non-residential only)
- ✓Relocate

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Flood Openings

Permanent Opening in a Wall that Allows the Free Passage of Water in Both Directions, **AUTOMATICALLY**, without Human Intervention.

A Window, a Door, or a Garage Door is **NOT** Considered an Opening.

Vents MAY be installed into a door or garage door.

Requirements for Flood Openings in Foundation Walls and Walls of Enclosures

Below Elevated Buildings in Special Flood Hazard Areas In Accordance with the National Flood Insurance Program

NFIP Technical Bulletin 1 / March 2020

FEMA

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Minimum Requirements for Foundation Openings

- Minimum of **two openings** on different sides of EACH enclosed area.
- The total net area of all openings must be at least **one (1) square inch for each square foot** of enclosed area.
- The bottom of all required openings shall be no higher than **one foot** above the adjacent grade at each opening.
- Openings may be equipped with screens, louvers, or other **"automatic"** coverings or devices, provided they permit the automatic flow of floodwaters in **both directions**.

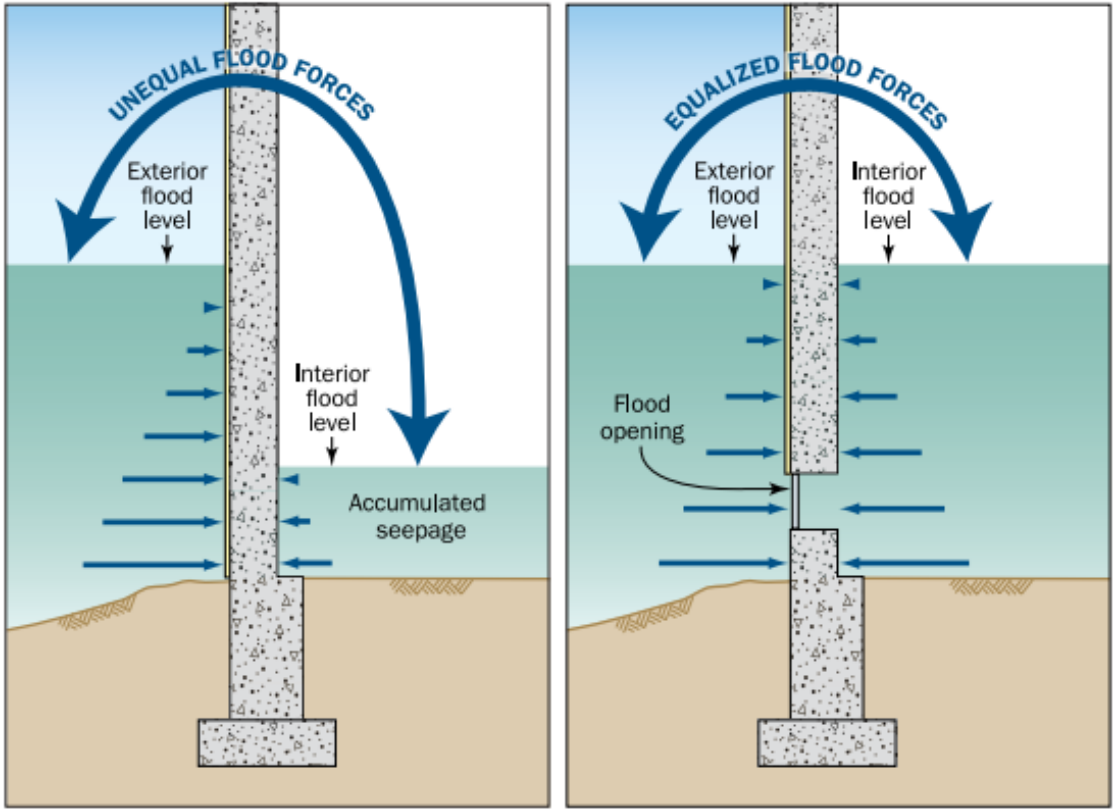
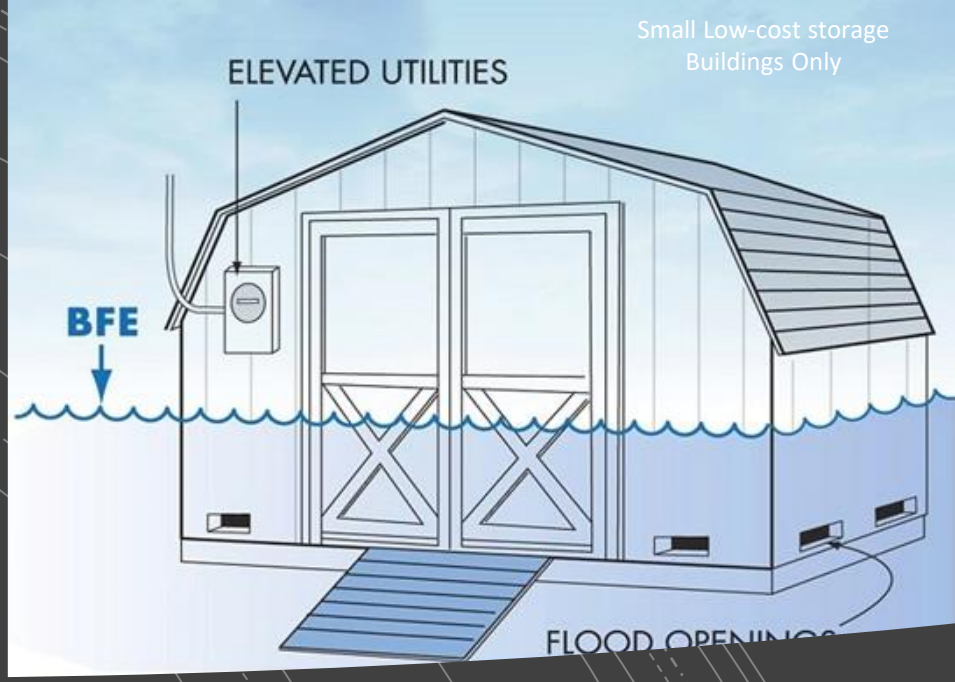


Figure 1: Equalizing flood forces (hydrostatic loads) on exterior walls



Flood Openings

Is the Standard Air Vent acceptable to be used as a flood opening or flood vent?

Standard Air Vent

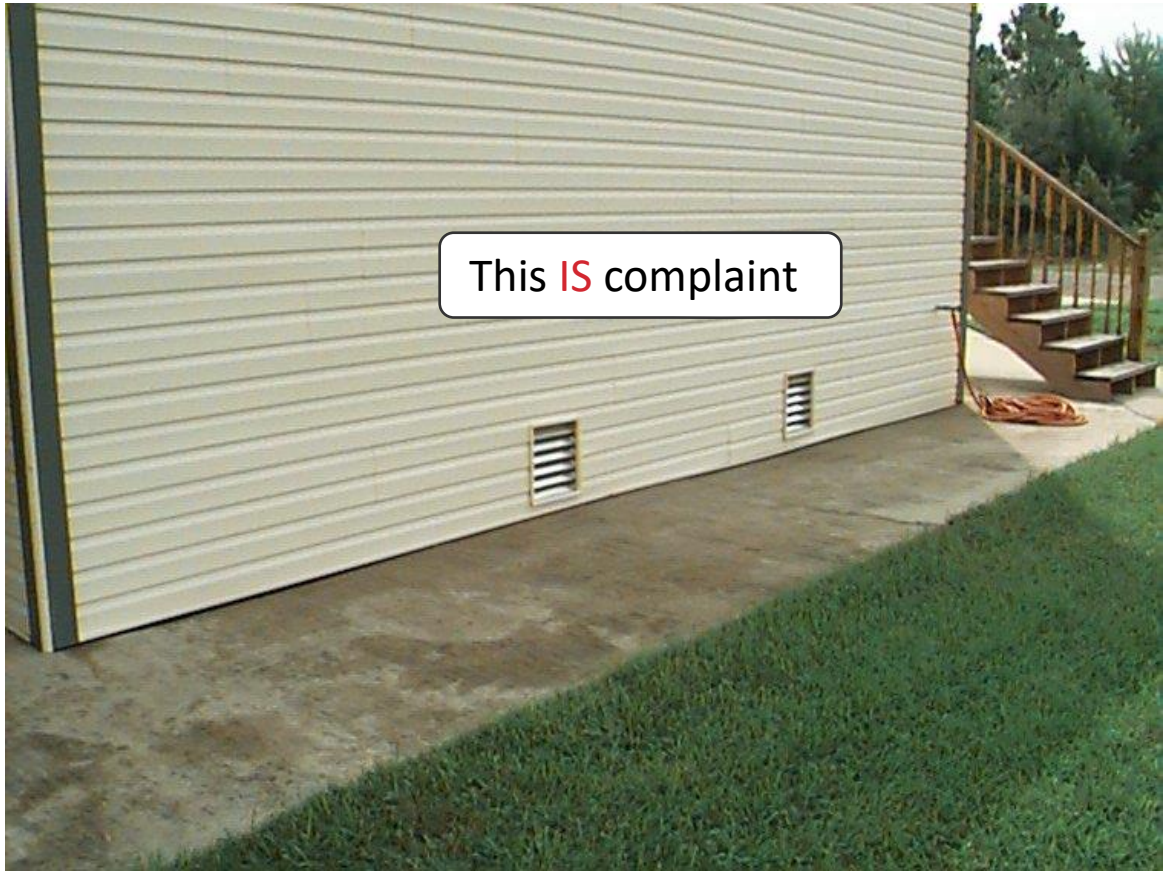
Figure 17: Standard air vent that is unacceptable as a flood opening because it is not disabled in the open position

× Can be closed manually

× Does not allow the automatic entry and exist of water

= Not acceptable as a flood opening UNLESS disabled in the OPEN position


Non-compliant
Within 1 foot of grade??


This IS complaint


This IS complaint


Plexiglas cover. This is a violation!!

Spray foam insulation. This is a violation!!

Engineered Openings/Vents

Plastic – No Rust or Rot Crawlspace Flood Vent for Homes (New Construction & Replacement)

Easy Access • Modular Use • Can Be Painted

Model Number	Opening Sizes (HxW)	Non Eng. (Sq. In.)	Eng. (Sq. In.)	Net-Free Air (Sq. In.)
D0816	8" X 16"	120	230	95
D1220	12" X 20"	240	425	175
D1232	12" X 32"	380	705	290
D1616	16" X 16"	255	485	200
D1624	16" X 24"	380	695	285
D1632	16" X 32"	510	935	385
D2032	20" X 32"	640	1,225	505
D2424	24" X 24"	575	1,065	435
D2436	24" X 36"	860	1,620	665

Flood Vent (No Cover)

One-piece ventplate with easy to insert vermin screen and fixed louver. Made of durable PVC/ ABS plastic (no rust or rot) with a UV retardant treatment.
FEMA compliant. No cover to allow the automatic entry and exit of floodwaters.
Quick and easy to install.

Crawl Space Door Systems
INCORPORATED

Plastic Crawlspace Doors & Vents
Plastic Crawlspace LouversScreens
Plastic FEMA Flood Vents

3700 Shore Drive, Virginia Beach, VA 23455
757.363.0005 • 1.800.230.9598 • www.crawlspacedoors.com

Flood Openings (TB 1 – August 2008)

...LOUVER, Patent No. US D583,042, dated December 16, 2008 and owned by ...d sized in accordance with Federal Emergency Management Agency's National ...ional Flood Insurance Program, Technical Bulletin (TB) 1-August 2008 will allow ...on exterior walls by allowing for entry and exit of floodwater during floods up to ...

...eered, Net-Free Air and Engineered Opening size for each model and size of the ...rded in the table below. The Engineered size opening calculation was performed ...gs in Foundation Walls for Buildings Located in Special Flood Hazard Areas in ...and ASCE/SEI 24-05, Flood Resistance Design and Construction. I measured the ...to determine the Non-Engineered and Net-Free Air opening size for each model. ...ug 2008 to determine the Engineered opening size for each model. I used the ...equired (in2); 0.033 = coefficient corresponding to a factor of safety of 5.0 (in2 - ...rectangular, long axis horizontal, short axis vertical unobstructed during design ...ween the louvers); R = 5 ft/hr worst case rate of rise and fall; and Aē = 1 ft2

...033 [1/0.40] 5 = .4125 in2

...0816: = 95/.4125 = 230

...gineered (Sq. ...)	Net-Free Air (Sq. Inches)	Engineered (Sq. Inches)
120	95	230
240	175	425
380	290	705
255	200	485
380	285	695
510	385	935
640	505	1,225
575	435	1,065
860	665	1,620

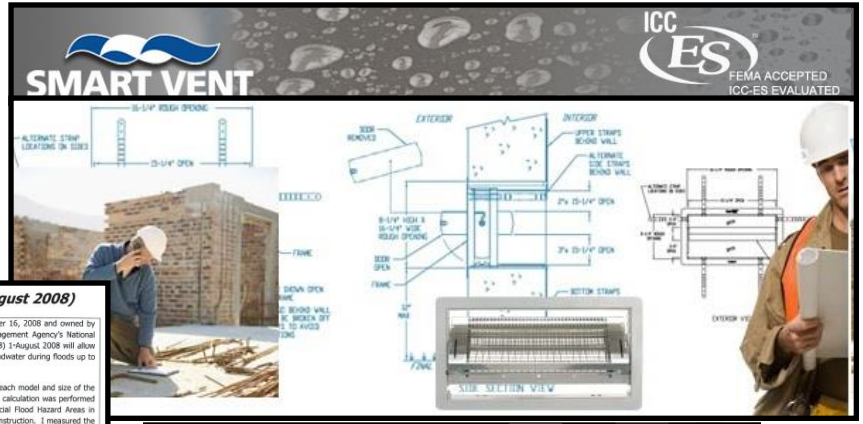
D2424 24" x 24"
D2436 24" x 36"

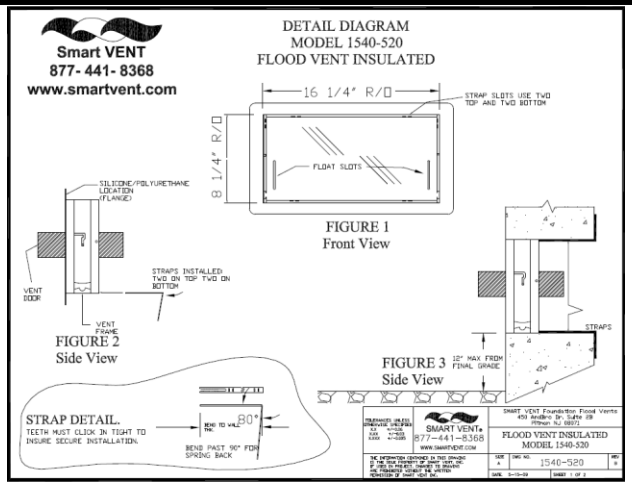
Installation Limitations and Instructions

Each individual opening, and any louvers, screens, or other covers, shall be designed to allow automatic entry and exit of floodwaters during design flood or lesser flood conditions; there shall be a minimum of two different sides of each enclosed area; if a structure has more than one enclosed area below the DFE, each area shall have openings; openings shall not be less than 3 in. in any direction in the plane of the wall; the bottom of each required opening shall be no more than 1 ft above the adjacent ground level; the difference between the exterior floodwater and interior flood shall not exceed 1 ft; in the absence of reliable data on the rates of rise and fall, assume a minimum rate of rise and fall of 5 ft/h.

Signature:
Title: PRESIDENT: HOUSE ENGINEERING, P.C.
Type of License: PROFESSIONAL ENGINEER
License Number: 24740

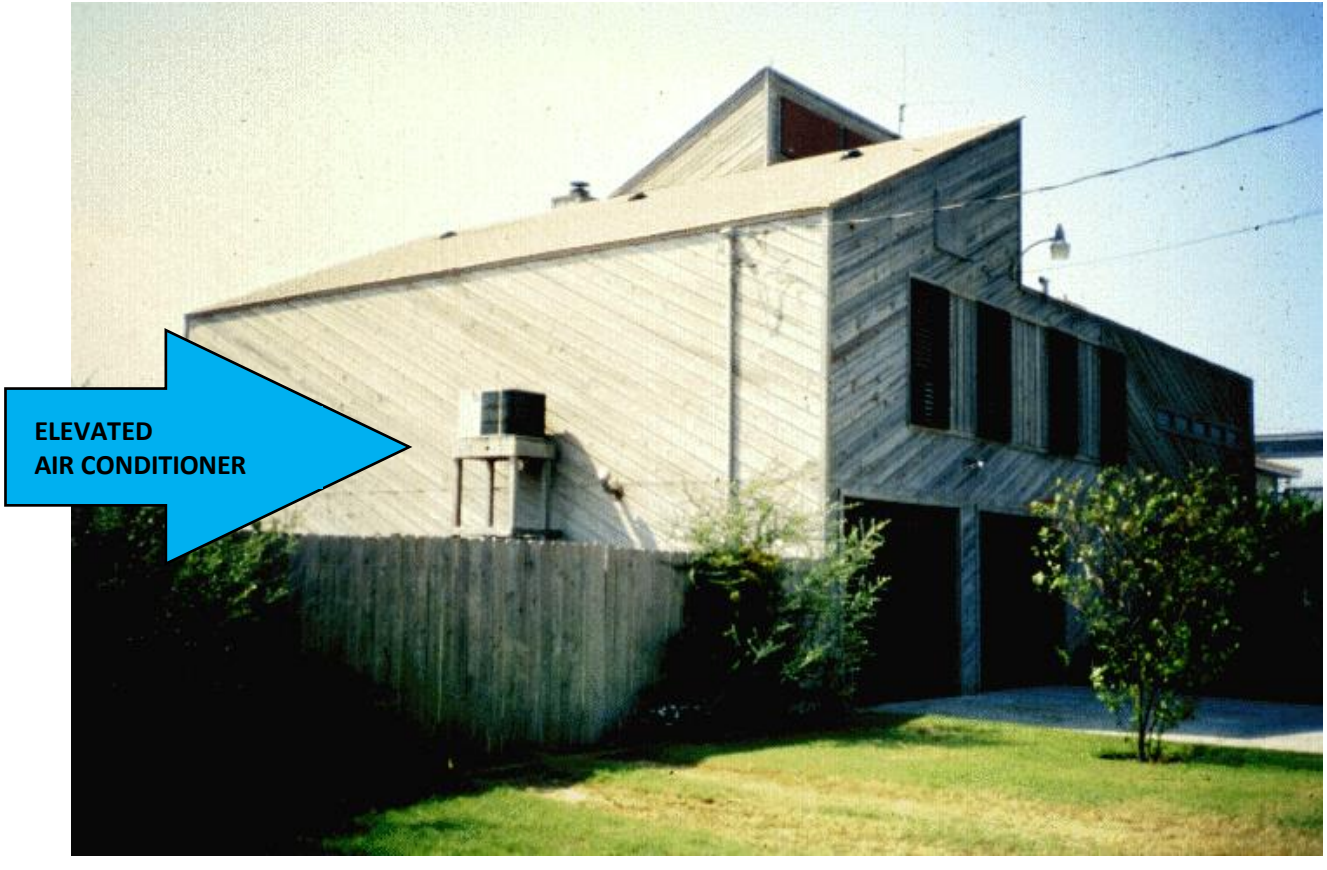
NORTH CAROLINA SEAL 24740 ENGINEER PROFESSIONAL
Professional Seal

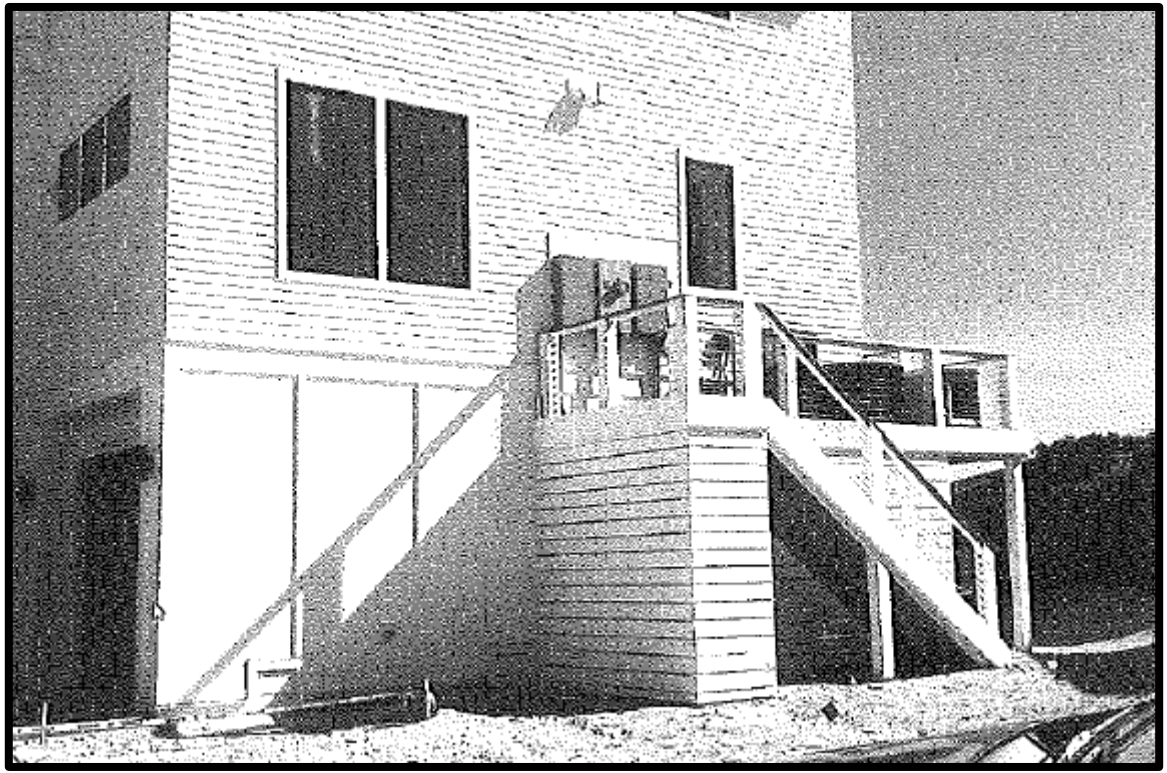


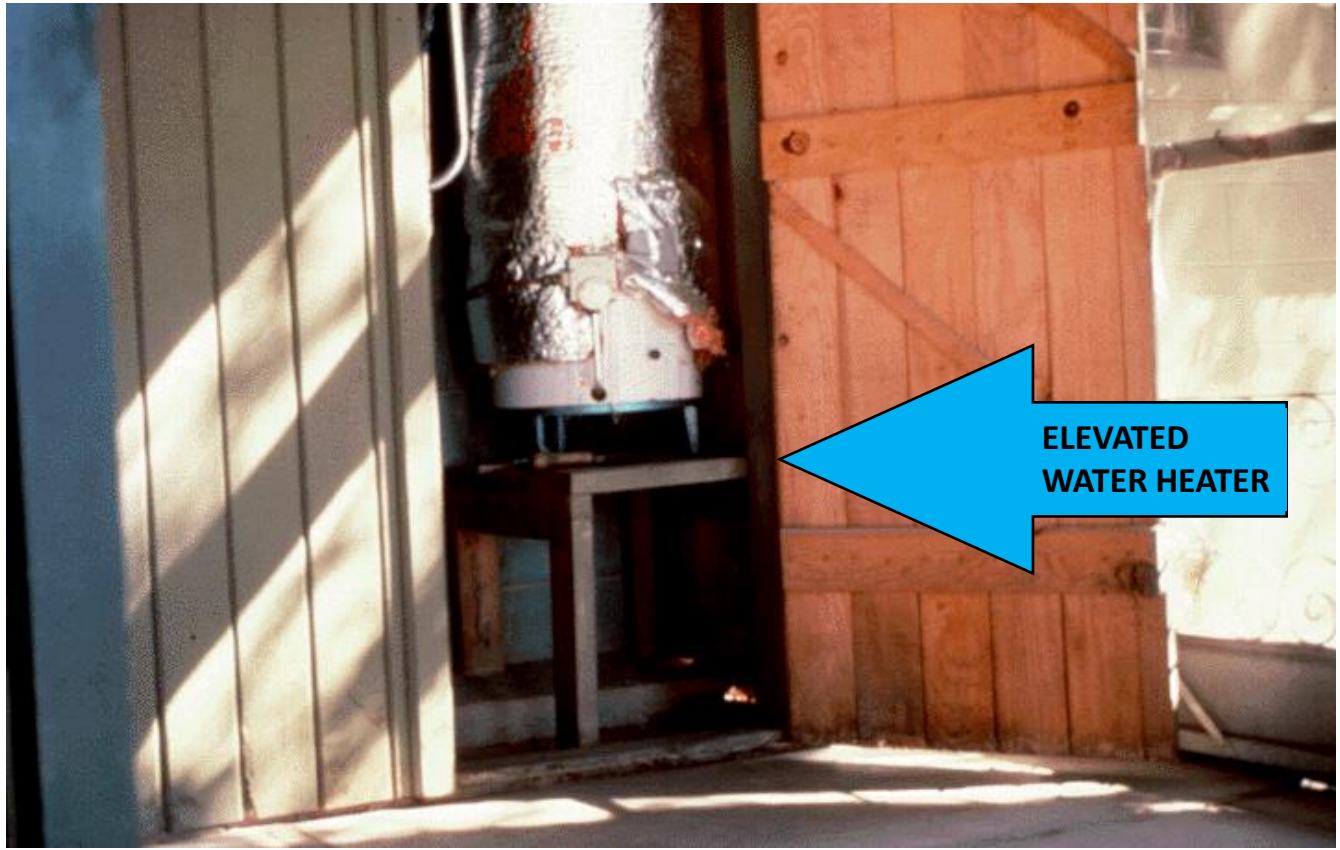


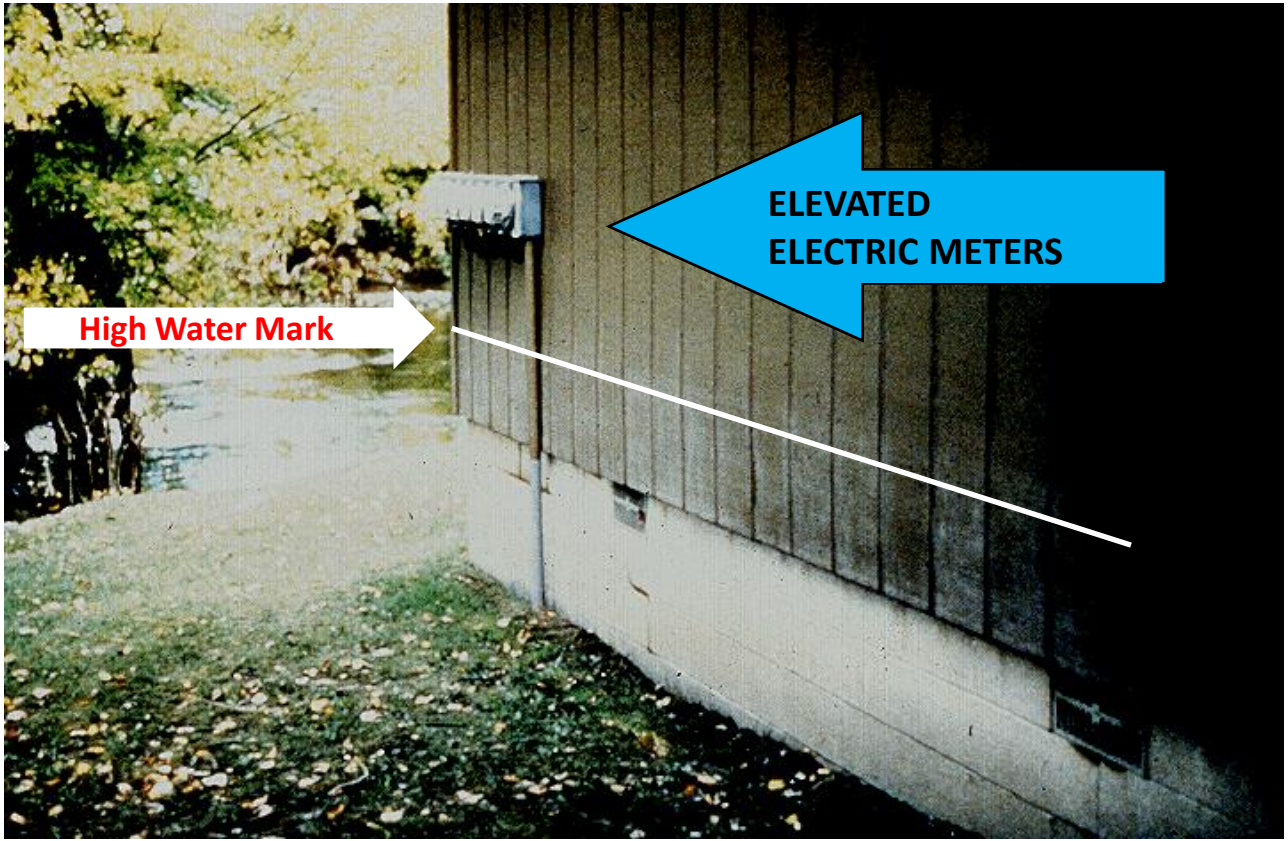
Flood Proofing

(Non-residential Only)


ELEVATED
AIR CONDITIONER

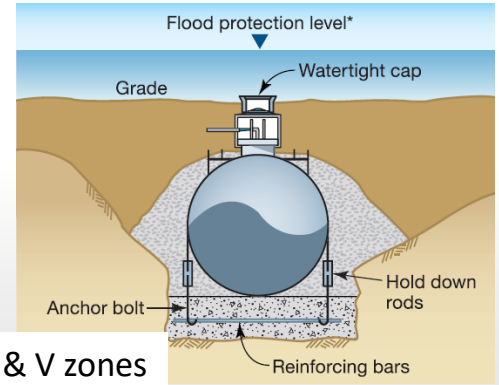



ELEVATED
WATER HEATER

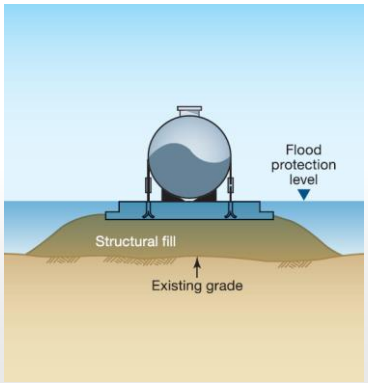

ELEVATED
ELECTRIC METERS
High Water Mark

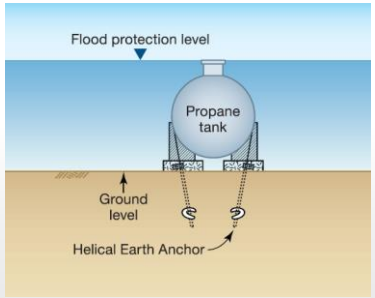
Other Development

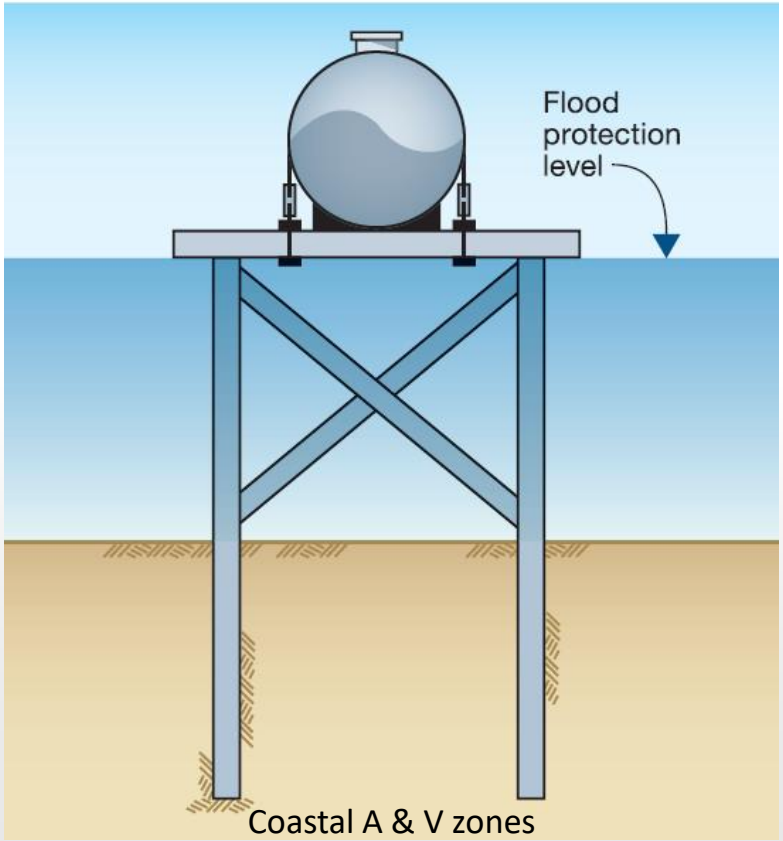
Fuel Tanks



Coastal A & V zones







Coastal A & V zones

Online Resources

FRIS – http://fris.nc.gov

ReadyNC – http://readync.org

Flood.NC.gov – http://flood.nc.gov

FIMAN – http://fiman.nc.gov

FloodSmart - http://floodsmart.gov

FEMA – http://fema.gov

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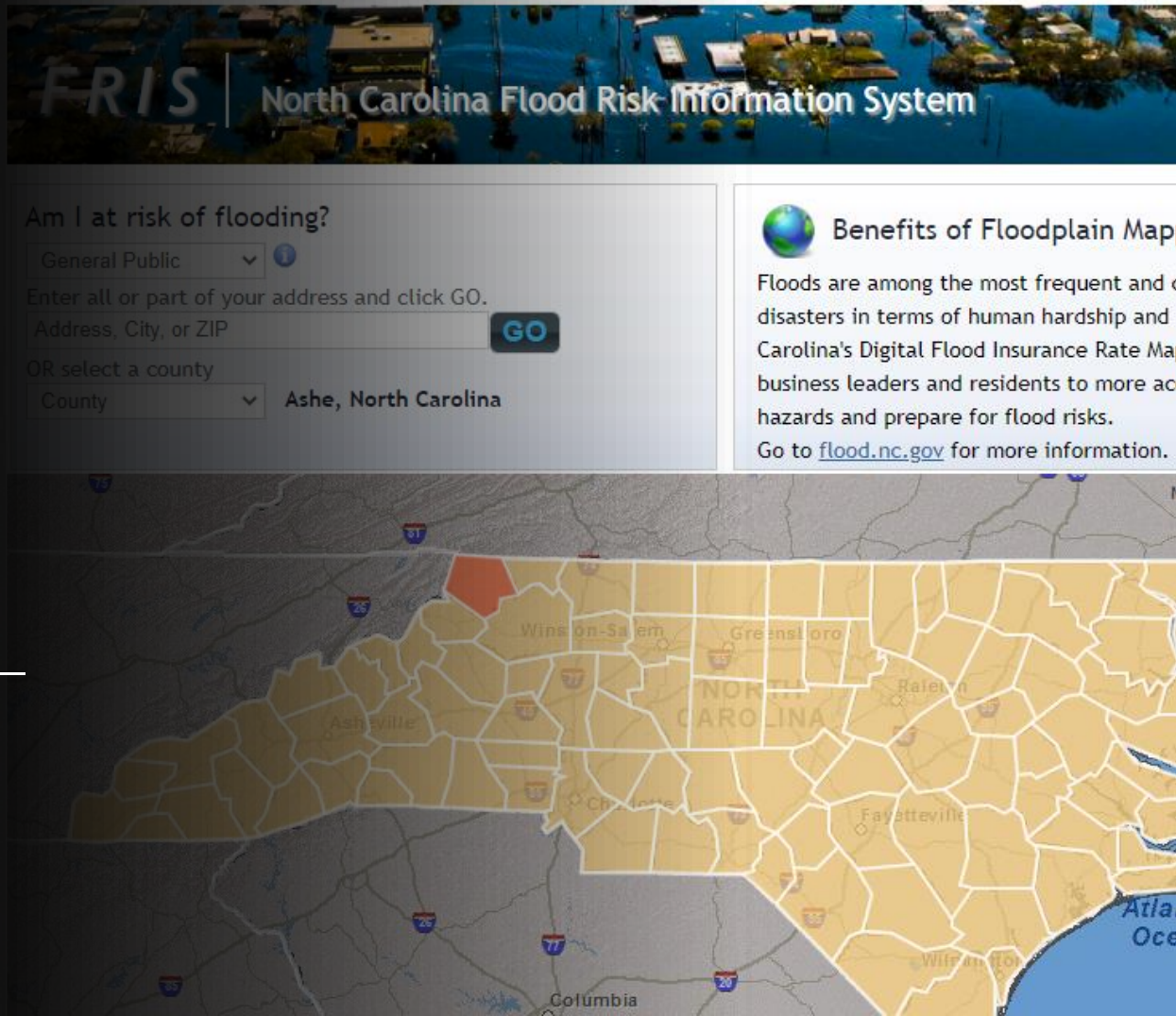
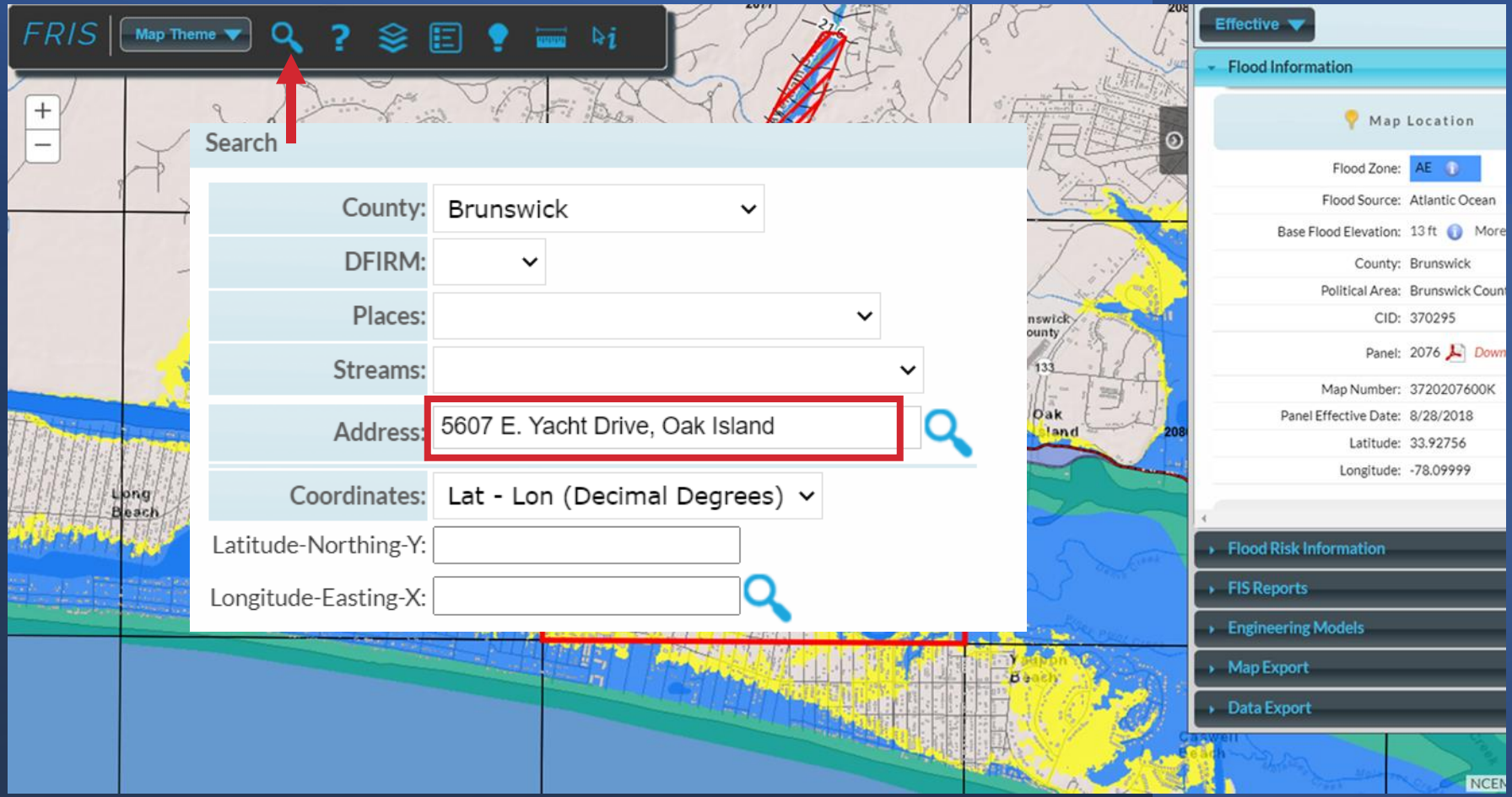
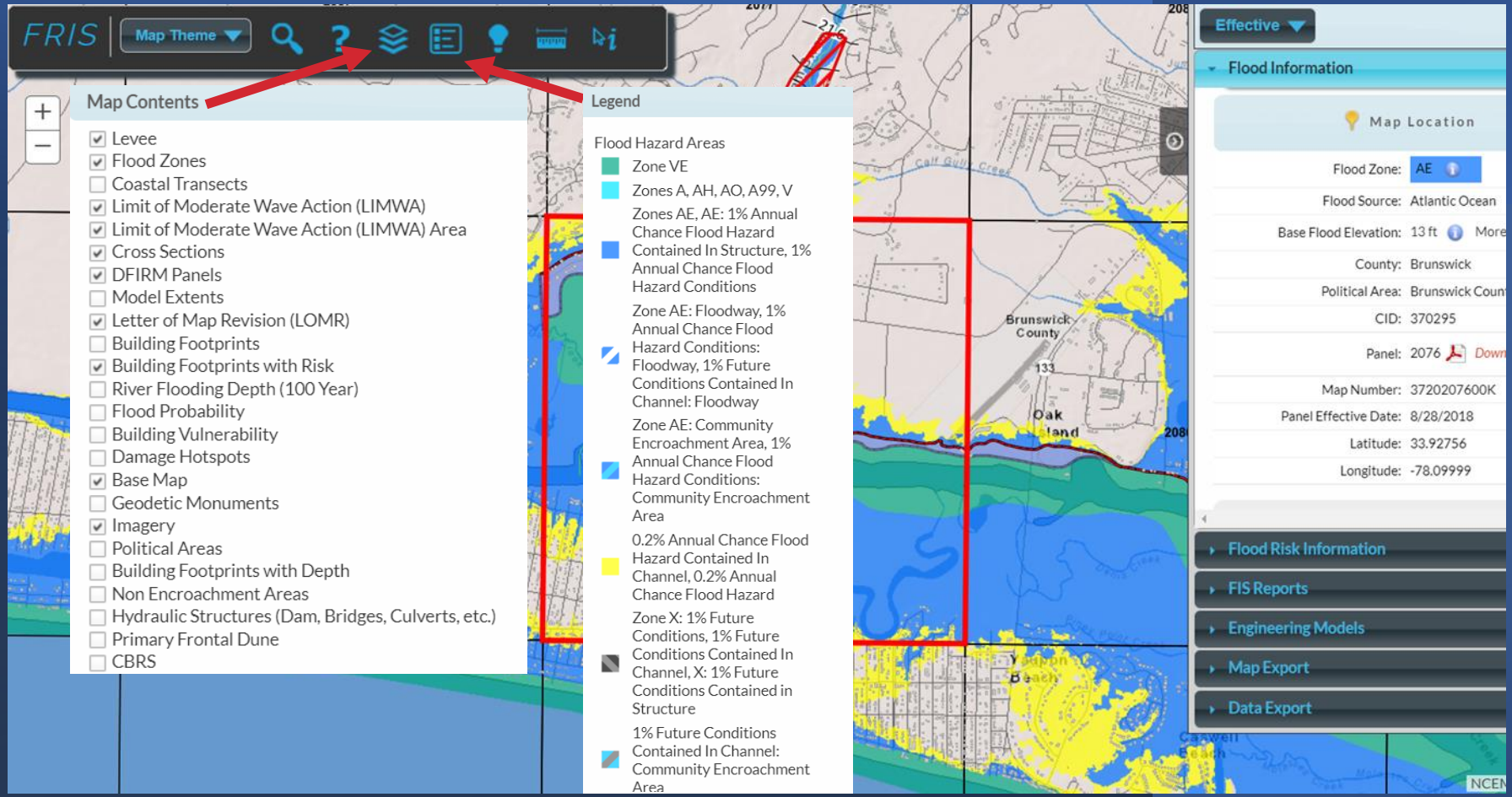
If you need flood zone/risk information for a property, where do you personally go to find that information?

Flood Risk Information System




FRIS
Map Theme
Search
County: Brunswick
DFIRM:
Places:
Streams:
Address: 5607 E. Yacht Drive, Oak Island
Coordinates: Lat - Lon (Decimal Degrees)
Latitude-Northing-Y:
Longitude-Easting-X:
Effective
Flood Information
Map Location
Flood Zone: AE
Flood Source: Atlantic Ocean
Base Flood Elevation: 13 ft
County: Brunswick
Political Area:
CID: 370295
Panel: 2076
Map Number: 3720207600K
Panel Effective Date: 8/28/2018
Latitude: 33.92756
Longitude: -78.09999
Flood Risk Information
FIS Reports
Engineering Models
Map Export
Data Export
Long Beach
Oak Island


FRIS
Map Theme
Map Contents
Levee
Flood Zones
Coastal Transects
Limit of Moderate Wave Action (LIMWA)
Limit of Moderate Wave Action (LIMWA) Area
Cross Sections
DFIRM Panels
Model Extents
Letter of Map Revision (LOMR)
Building Footprints
Building Footprints with Risk
River Flooding Depth (100 Year)
Flood Probability
Building Vulnerability
Damage Hotspots
Base Map
Geodetic Monuments
Imagery
Political Areas
Building Footprints with Depth
Non Encroachment Areas
Hydraulic Structures (Dam, Bridges, Culverts, etc.)
Primary Frontal Dune
CBRS
Legend
Flood Hazard Areas
Zone VE
Zones A, AH, AO, A99, V
Zones AE, AE: 1% Annual Chance Flood Hazard Contained In Structure, 1% Annual Chance Flood Hazard Conditions
Zone AE: Floodway, 1% Annual Chance Flood Hazard Conditions: Floodway, 1% Future Conditions Contained In Channel: Floodway
Zone AE: Community Encroachment Area, 1% Annual Chance Flood Hazard Conditions: Community Encroachment Area
0.2% Annual Chance Flood Hazard Contained In Channel, 0.2% Annual Chance Flood Hazard
Zone X: 1% Future Conditions, 1% Future Conditions Contained In Channel, X: 1% Future Conditions Contained in Structure
1% Future Conditions Contained In Channel: Community Encroachment Area
Brunswick County
Oak Island
Effective
Flood Information
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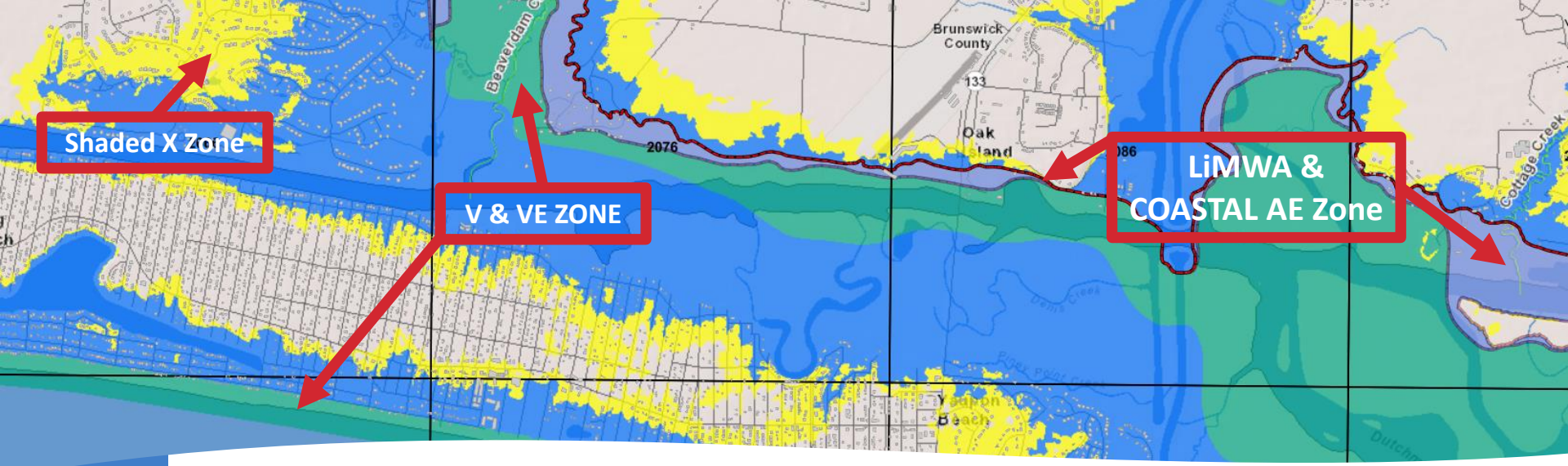
Engineering Models
Map Export
Data Export



FRIS Symbology and What it means for Development

- V & VE Zones = Pile foundations, breakaway walls, flood vents, etc.
- LiMWA = Limit of Moderate Wave Action (Red Line)
- Coastal AE Zone = V-zone development standard
- Shaded X Zone = NOT Special Flood Hazard Area (SFHA)

Always contact your local jurisdictions to learn about their development requirements!!!

FRIS Symbology and What it means for Development

- AE Non-encroachment Area (NEA) = No-Rise Analysis by Engineer
- AE Floodway = No-Rise Analysis by Engineer
- Required for ALL development including fill, grading, storage of materials, etc.

ReadyNC.org

Insurance

Español

One of the best things for homeowners, renters and business owners against any type of natural disaster is a good insurance policy. Be aware that homeowner's insurance does not cover flood damage. You **need** a separate flood insurance policy. Homeowners, renters and business owners can buy flood insurance even if they reside in a high, low or moderate risk area. Policies are available for both residential and commercial buildings as long as the community joins in the National Flood Insurance Program.

For more North Carolina Insurance Information, call 800-546-5664 or 919-807-6750.

For information about the National Flood Insurance Program, call 888-379-9531.

Plan and Prepare

Evacuating
Functional Needs
Get a Kit
Hurricane Guide
Insurance
Make a Plan
Pets and Service Animals
Protect Your Home
Seniors
Vital Records

Flood.NC.gov

flood.NC.gov

Go to FRIS site | Go to FIMAN site

Home | Property Risk | Mapping Program | Find a Document | Events | Floodplain Management | LOMC | Mitigation | Flood Warning | Industries

Property Risk ESTIMATOR

Calculate Risk Level

Insurance Costs ESTIMATOR

Calculate Premiums

Events & Training

See More >

Real Estate Agents

For Agents Who Sell Real-Estate in a Flood-Hazard Area

"Potential buyers want to know how to mitigate flood hazards on property within the flood plain."

Important Links:

NC Flood Risk Information System
FEMA Map Service Center
North Carolina NFIP Updates
Find Meetings & Training

Frequently Asked Questions

How do I determine if the structure is in the SFHA?
Check the Flood Risk Information System Website: FRIS

Will an elevation certificate be required?
A Post-FIRM structure should have an elevation certificate completed at the time of construction. An EC is required for rating the flood insurance policy.

Do Pre-FIRM structures require an elevation certificate?

More Answers from the Quick Guide

See All >

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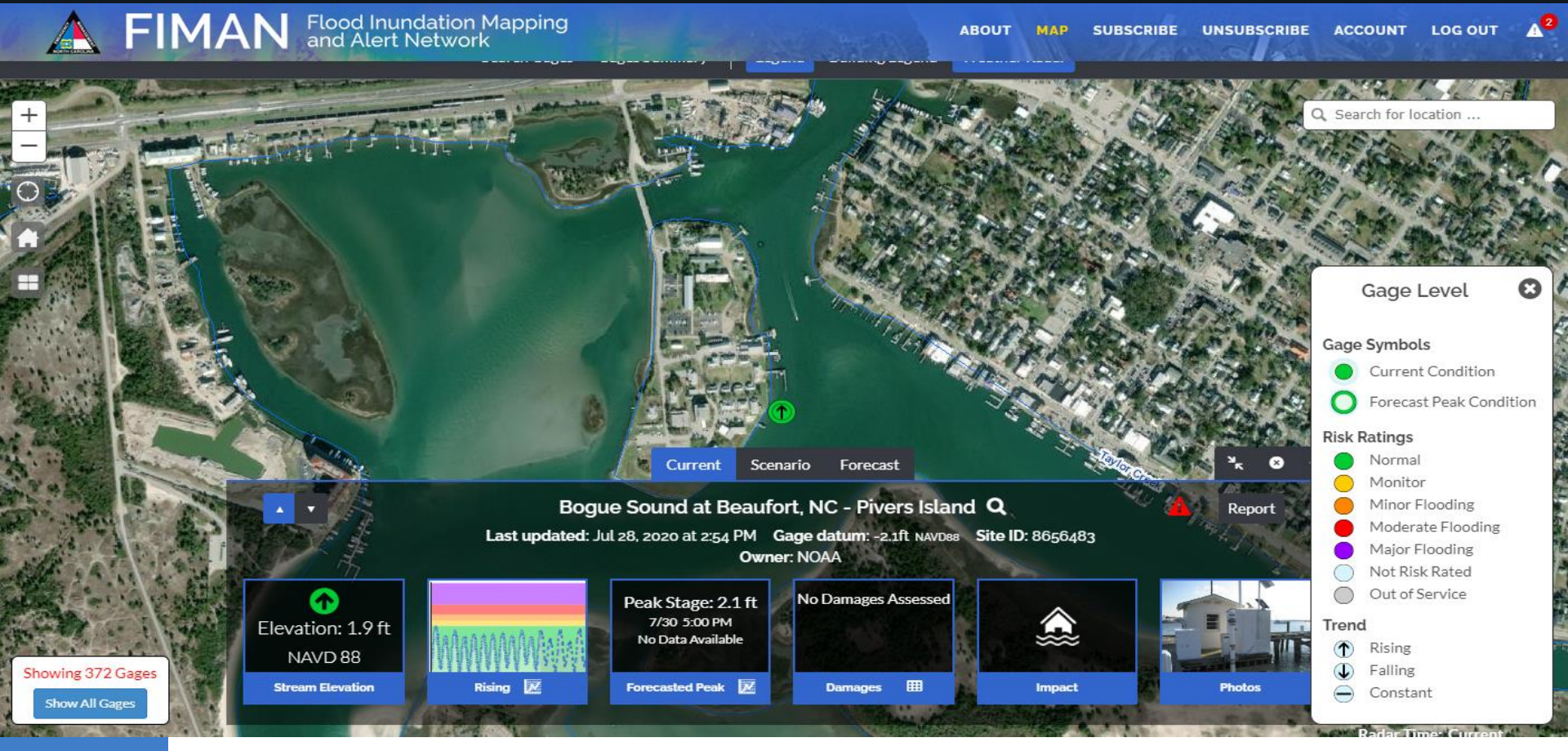

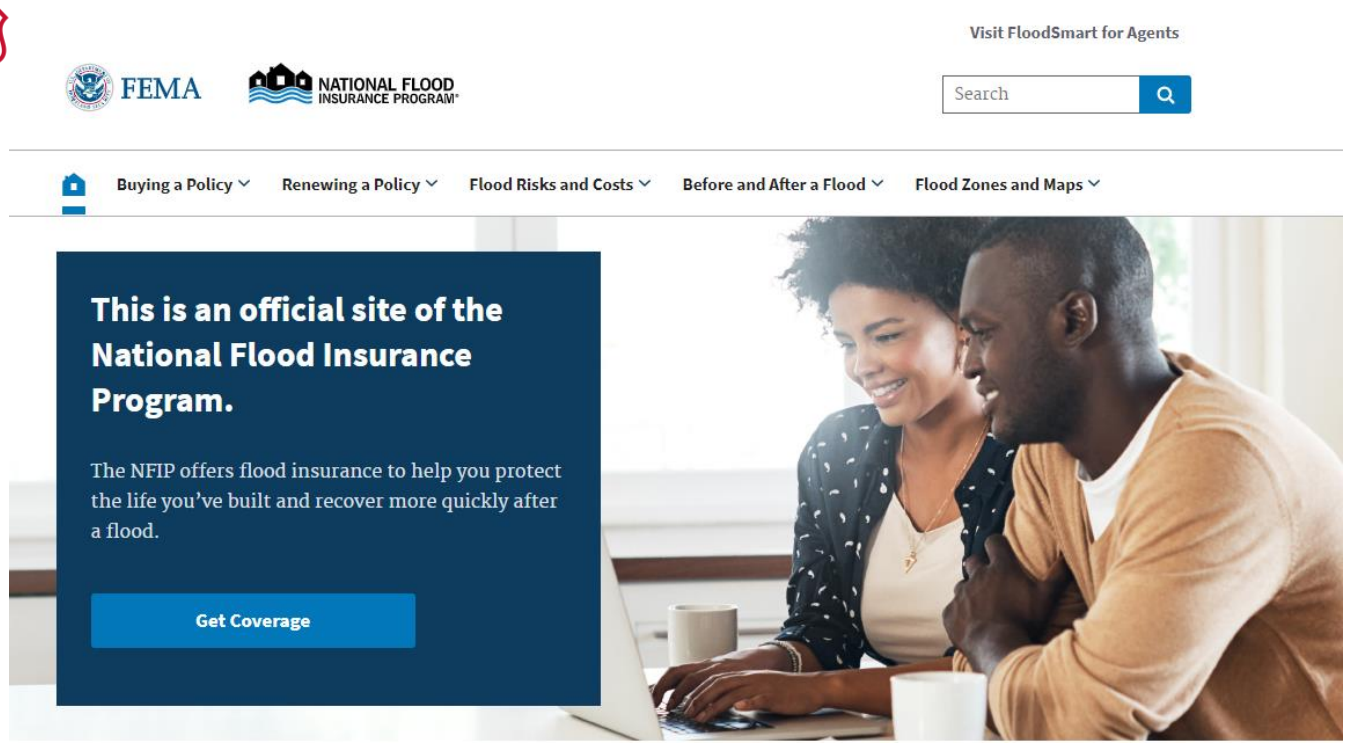

FloodSmart.gov

Hurricane Dorian - 2019

NC NFIP Contact Information

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Questions?

Thank You for having me!