

# **Certified Floodplain Surveyor Biennial Update**

Instructed by Steve Garrett & Gary Thompson  
Wake Forest, NC  
Friday, April 29, 2022





# North Carolina Department of Public Safety

## Emergency Management

Roy Cooper, Governor  
Eddie Buffaloe, Jr., Secretary

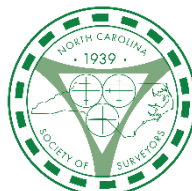
William C. Ray, Director

## CFS Refresher

April 29, 2022

## Agenda

NFIP Updates	S. Garrett	12:00 PM
NCFMP Updates	S. Garrett	12:30 PM
LOMC Processing Updates	S. Garrett	1:00 PM
Elevation Certificates	S. Garrett	1:30 PM
Geodetic and FIMAN Updates	G. Thompson	3:15 PM
Adjourn		4:00 PM



### Sponsored by:

- National Society of Professional Surveyors (NSPS)
- NC Geodetic Survey (NCGS)
- NC Society of Surveyors (NCSS)
- NC Floodplain Mapping Program (NCFMP)

**MAILING ADDRESS:**  
4218 Mail Service Center  
Raleigh NC 27699-4218  
[flood.nc.gov/ncflood](http://flood.nc.gov/ncflood)



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**OFFICE LOCATION:**  
4105 Reedy Creek Road  
Raleigh, NC 27607  
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Fax: (919) 715-0408



# **North Carolina Certified Floodplain Surveyor Refresher**

## **NFIP and Legislative Updates**

**April 29, 2022**





# National Flood Insurance Program



*The Mission: To prevent or reduce damages and loss due to floods through management of the National Flood Insurance Program and coordination with the Flood Mitigation Assistance Program.*



North Carolina Emergency Management





# National Flood Insurance Program

- Minimize Flood Losses
- Regulations in 44 CFR 59-65
- Enforced through local ordinance
- Participation is voluntary
  - Required to purchase flood insurance through the NFIP





# NFIP Mission

- Regulatory Framework for Flood Damage Prevention
- Map Flood Hazards
- Provide Flood Insurance
- Hazard Mitigation
  - HMGP
  - FMA
  - BRIC





# Who Writes Flood Insurance?

## State Licensed Insurance Agents:

- Can write property and casualty policies.
- Are in good standing with the licensing department.
- Must meet mandatory training requirements.
- WYO and NFIP Directly

Referrals to agents by locality are at:

[www.floodsmart.gov](http://www.floodsmart.gov) 1-888-379-9531

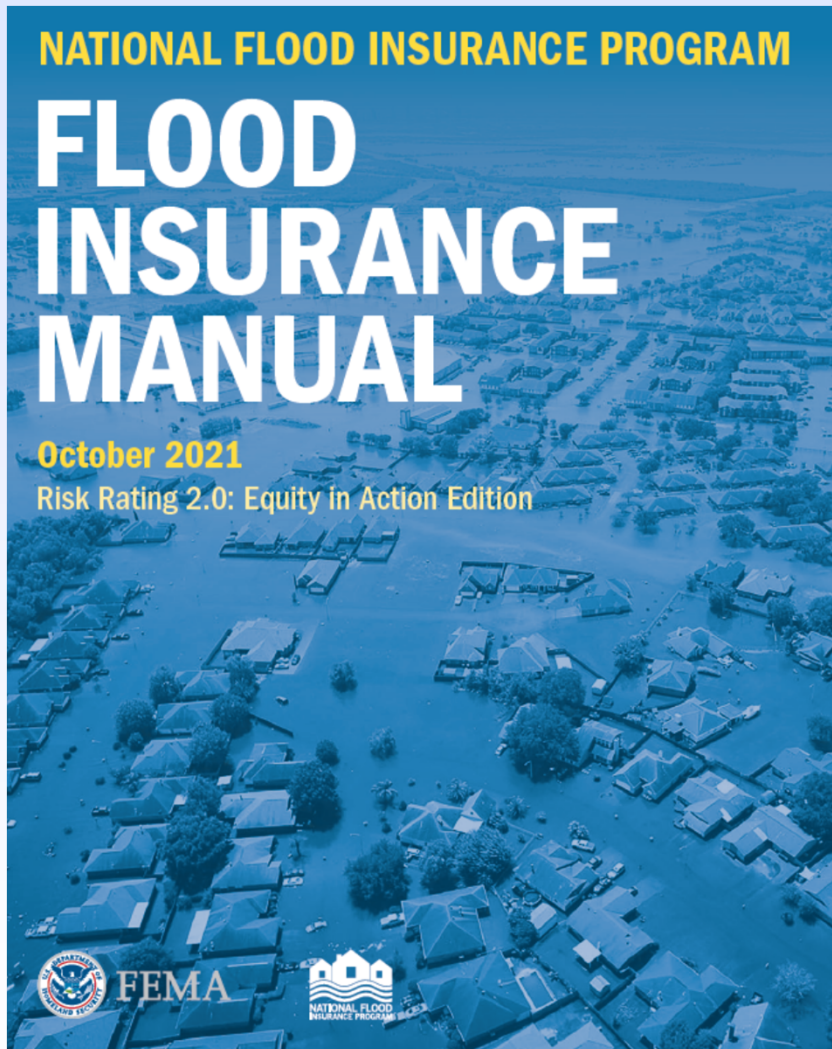


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# General Rules: Writing NFIP Flood Insurance



## The NFIP Flood Insurance Manual:

Provides the general rules for writing NFIP flood insurance.

Is available at:

<http://www.fema.gov>

Write your own  
NFIP Direct



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# NFIP Limits of Coverage

Insured Buildings	NFIP Coverage Limits	
Structure	Emergency Program	Regular Program
▪ Single Family	\$35,000	\$250,000
▪ Other Residential	\$100,000	\$500,000
▪ Nonresidential	\$100,000	\$500,000
Contents		
▪ Residential	\$10,000	\$100,000
▪ Nonresidential	\$100,000	\$500,000



# Mandatory Purchase Requirement

The mandatory purchase requirement applies to properties in SFHAs.

Insurance is a prerequisite to receive a loan from Federally regulated and insured lenders.

- The requirement is triggered when a loan is:

- Made.
- Increased.
- Renewed.
- Extended.

***Flood Fact:*** A structure in the SFHA has a minimum 26% chance of flood loss over a 30-year period.

The insurance must be in effect for the life of the loan.



# NFIP Policies by State – April 2022

	State	Policies in Force	Insurance In Force
1	Florida	1,630,939	\$422,000,454,694
2	Texas	747,111	\$222,950,271,240
3	Louisiana	490,813	\$138,017,715,384
4	California	189,579	\$57,050,207,400
5	South Carolina	195,397	\$53,870,588,500
6	New Jersey	203,442	\$53,112,770,500
7	New York	158,848	\$44,898,615,200
8	North Carolina	131,676	\$35,891,967,600
9	Virginia	95,757	\$26,514,295,400
10	Georgia	75,718	\$21,349,387,400



# Current NFIP Status – Nationwide

- Policies In Force: 4,710,344
- Insurance In Force: \$1,270,674,811,118
- Participating Communities: 22,525



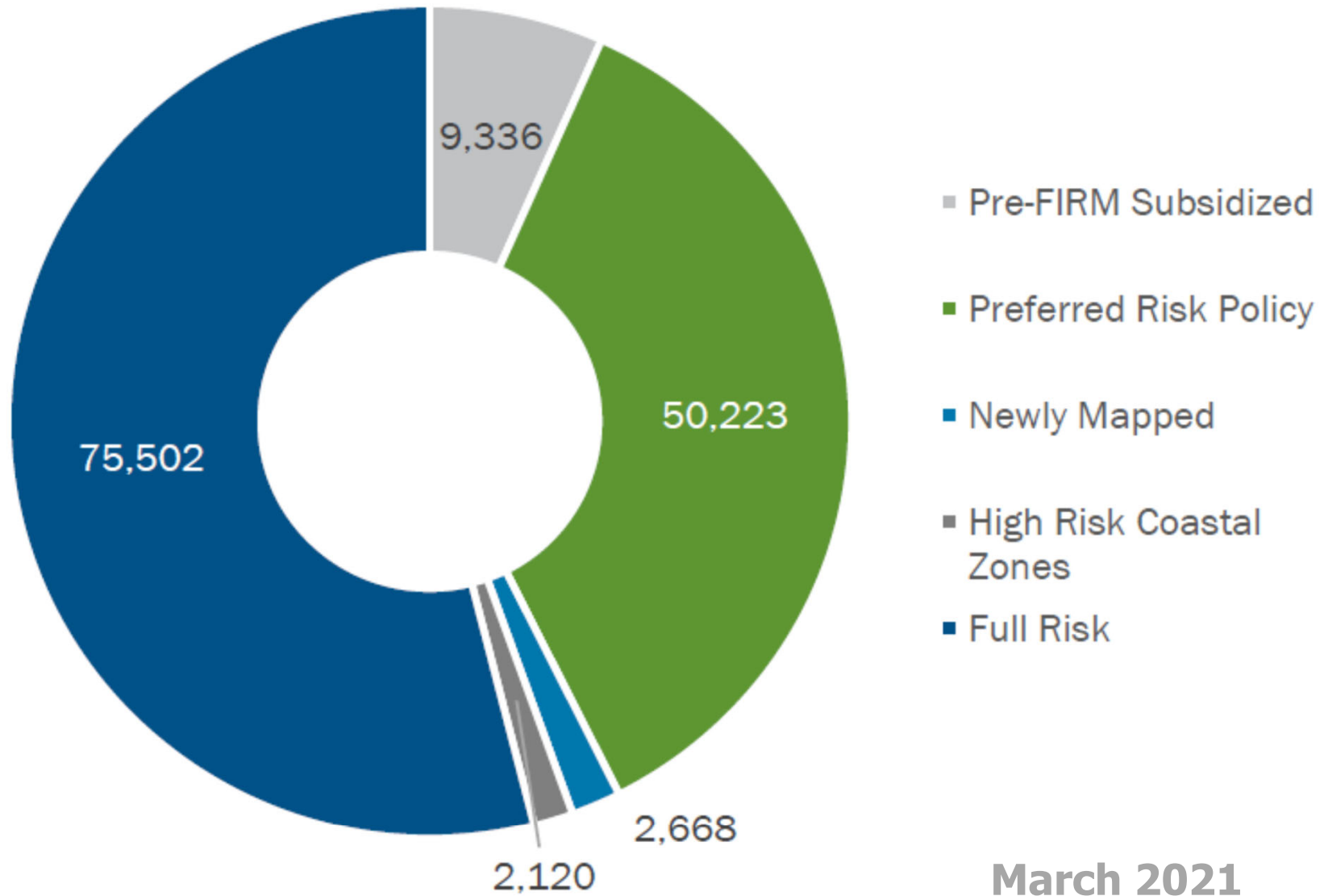
# Current NFIP Status – North Carolina

- Insurance In Force: \$35,891,967,600
- Policies In Force: 131,676 (↓138,918)
  - V-Zone: 1,761 (↓1,933)
  - A-Zone: 57,671 (↓60,654)
  - X-Zone: 72,244 (↓76,331)
- Participating Communities: 594
- Non-Participating Communities: 27



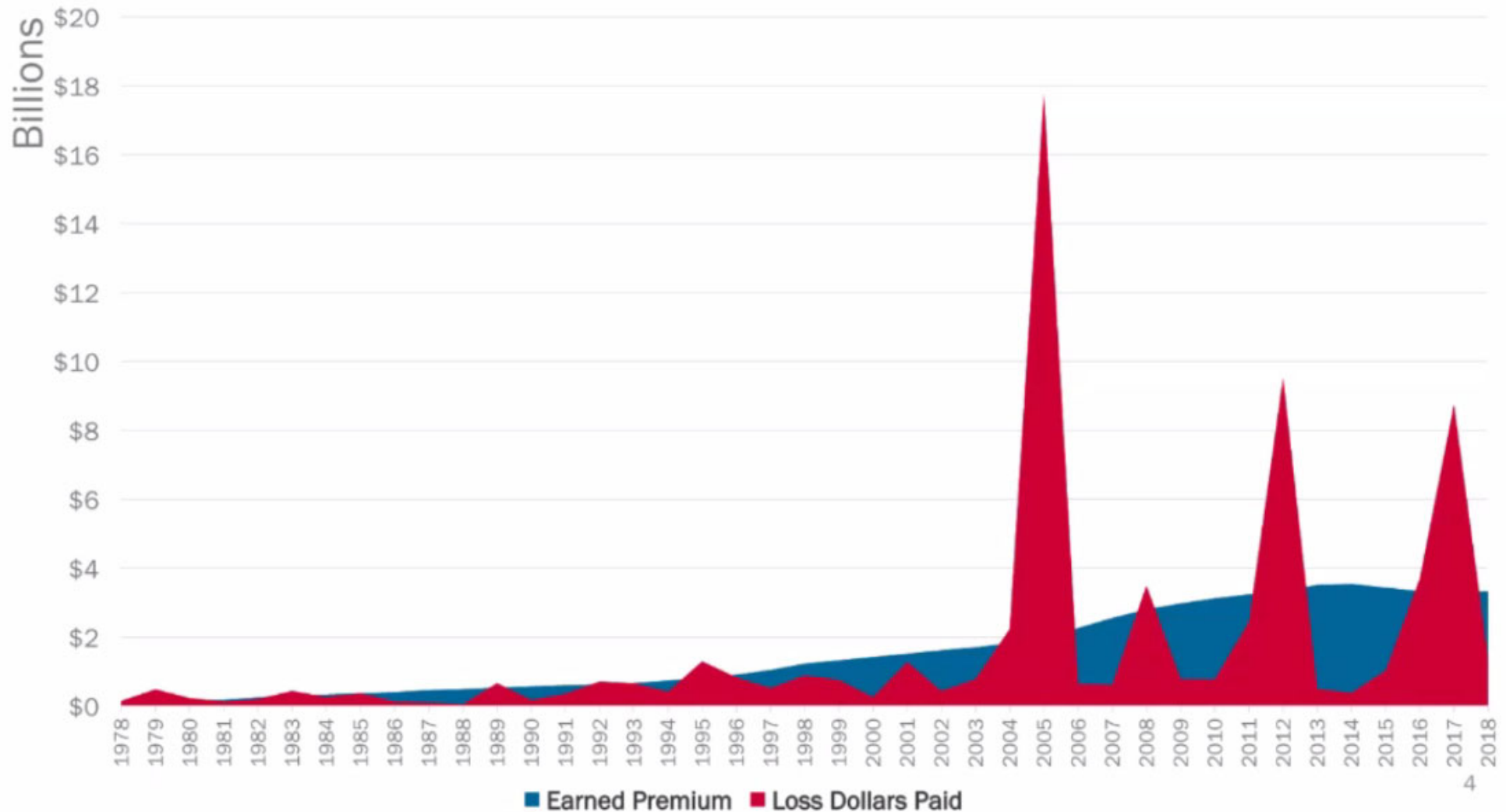


## NFIP Policies in Force in NC by Rate Class





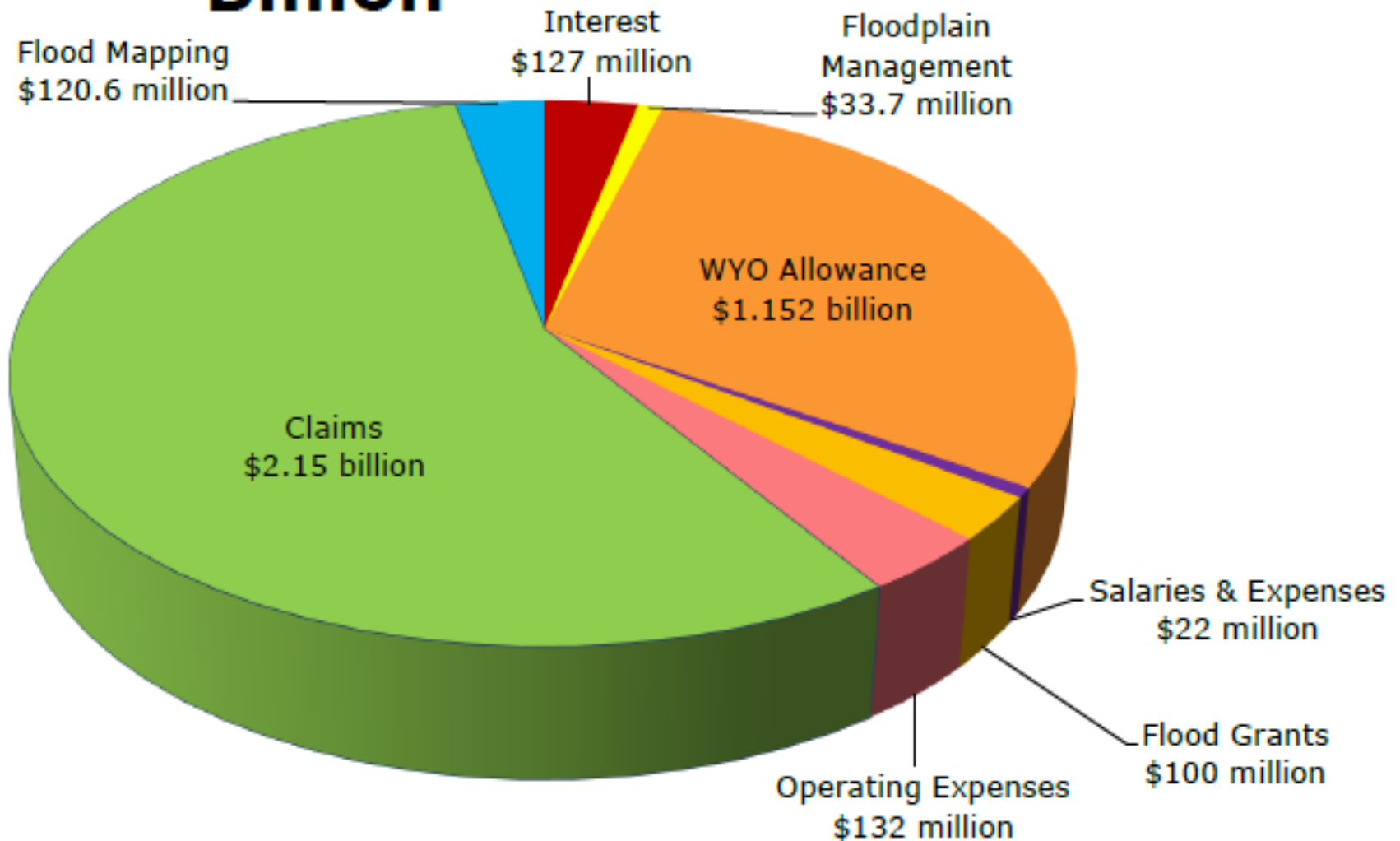
# PREMIUMS VS. CLAIMS





# FY14 Natl Flood Insurance Fund

**Premium & Fee Revenue: \$3.84 Billion**





# Staff

- Steve Garrett: NFIP Coordinator
- Eryn Futral: NFIP Eastern Planner
- Matt Stillwagon: NFIP Central Planner
- Terry Foxx: NFIP Western Planner
- Jintao Wen: NFIP Engineer
- Scott Gentry: LOMC Manager
- Stacey Fuller: NCFMP Outreach Planner
- Milton Carpenter: NCFMP Outreach Planner



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# Community Assistance Program Objectives

- Training and Education
  - NFIP 101
  - Summer Workshops
  - FEMA Field-Deployed Classes
  - Conferences and Workshops
  - NC Society of Surveyors



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# Community Assistance Program Objectives

- Community Assistance
  - Map Scoping and Updates
  - Ordinance Updates
  - Visits (Audits)
  - Contacts
  - Technical Assistance
  - “No-Rise” Reviews



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# Community Assistance Program Objectives

- Disaster Response
- Environmental Clearinghouse
  - NEPA
  - SEPA
- NCDOT Bridge Replacement MOA





# Certified Floodplain Manager

- The Association of State Floodplain Managers established a program for professional certification of floodplain managers.
  - 15,000+ Certified Floodplain Managers
  - Multiple Fields



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# Certified Floodplain Surveyor

- Managed by NC Society of Surveyors
- 149 CFS Active
- Expedited Processing
  - Letter of Map Amendment
  - Letter of Map Revision Based on Fill



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# Reauthorization

- Extended to September 30, 2022
- In case of lapse:
  - Payment of valid claims
  - No new policies
  - No renewals
  - Affect 40,000 home sales per month nationwide



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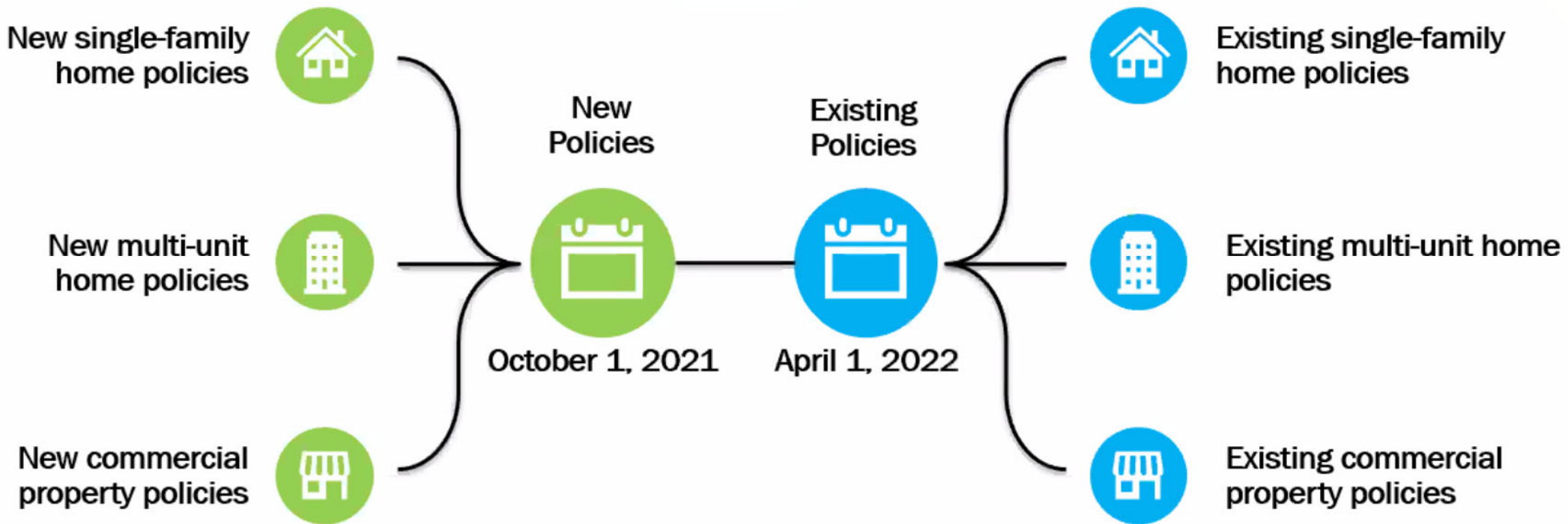


# Risk Rating 2.0

- Create an individualized picture of a property's risk
  - *Where it rains, it can flood*
- Provide rates that are easier to understand for agents and policyholders
- Reflect more types of flood risk in rates
- Use the latest actuarial practices to set risk-based rates
- Reduce complexity for agents to generate a quote



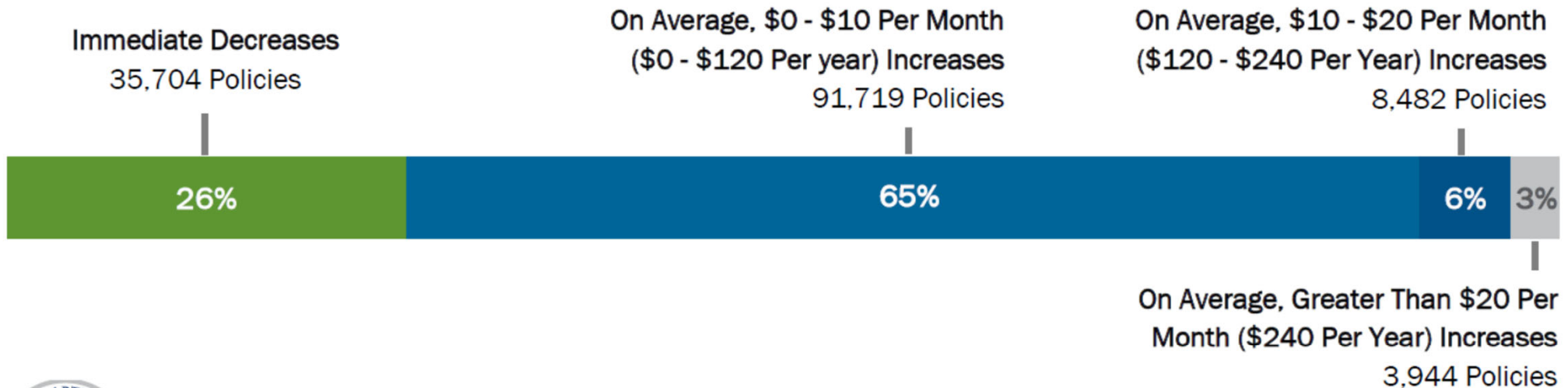
# Risk Rating 2.0





# Risk Rating 2.0

## Risk Rating 2.0 in North Carolina



FEMA

March 2021 1



# What is not changing?

- 30-day waiting period
- Mandatory Purchase Requirement
- Floodplain Management
- Statutory caps on annual rate increases
- Building/Contents coverages and Increased Cost of Compliance (ICC)
- Transfers of policy discounts to new homeowners
- Availability of premium discounts under the Community Rating System (CRS)



# What is changing?

- Rating methodology
- Simplifying the quote process
  - Risk Rating Engine
- Elevation Certificates no longer required to rate policy
- Mitigation credits and discounts
  - Flood openings, elevate machinery and equipment, elevate on posts, piles, or piers
- Expanding CRS discounts
  - Discount will now apply to all policies within the community
- Reflecting prior claims for all properties



# What is changing?

- FEMA is phasing out/eliminating:
  - Preferred Risk Policy (PRP)
  - Mortgage Portfolio Protection Program (MPPP)
  - Submit for Rate
- All will be replaced with actuarial rates



# What is changing?

- Fees, Surcharges, and Assessments
  - Federal Reserve Fund Assessment = 18%
  - Federal Policy Fee = \$47
  - ICC Premium will be based on a percentage (1.9%) of the premium, not to exceed \$75
  - Condominium Policy Fee
    - Residential – sliding scale based on the number of units
    - Non-residential - \$47

Units 1-20	\$47 per unit
Units 21-40	\$20 per unit
Units 41-100	\$10 per unit
Units 101+	\$2 per unit



# Fees/Surcharges not changing

- Fees, Surcharges, and Assessments
  - Policy (HFIAA) Surcharge
    - Primary residence = \$25
    - All other policies = \$250
  - Probation Surcharge = \$50



# What is changing?

- The policy premium will not exceed \$12,125 per year for a single-family residential structure
- Under the legacy rating, policy premiums could exceed \$45,000 per year.



# Flood Risk

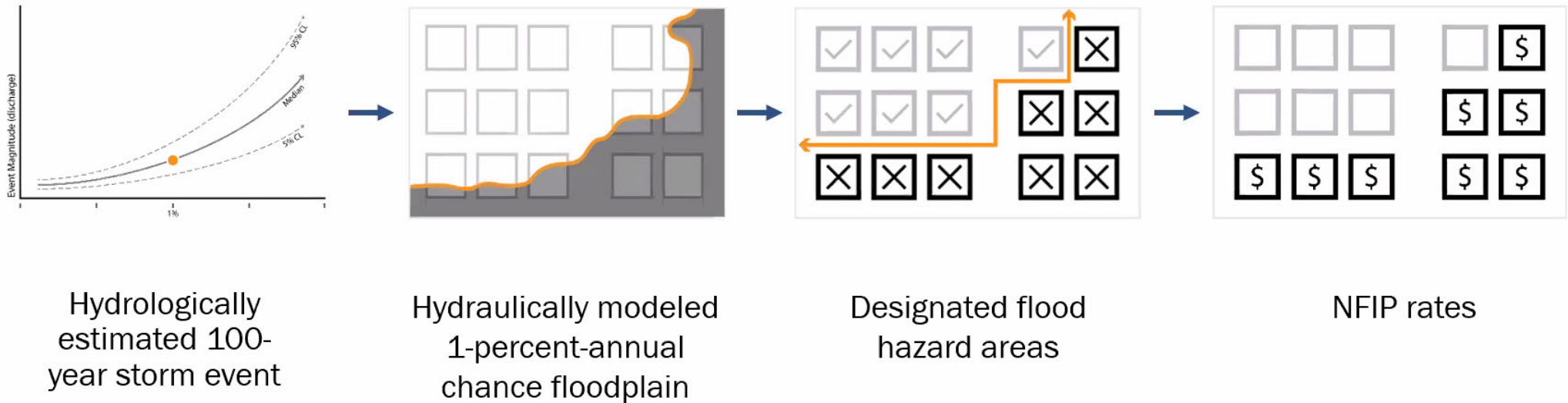
- Multiple data sets to represent a fuller reflection of flood risk
- Graduated data
- Pluvial (heavy rainfall)
- Inland vs. Coastal Risk
- Levees
- Tsunami
- Great Lakes flooding







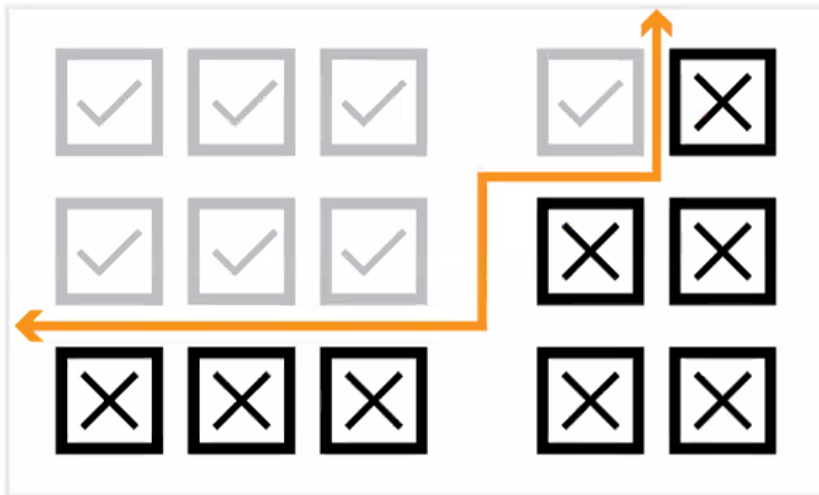
# Legacy Deterministic Approach





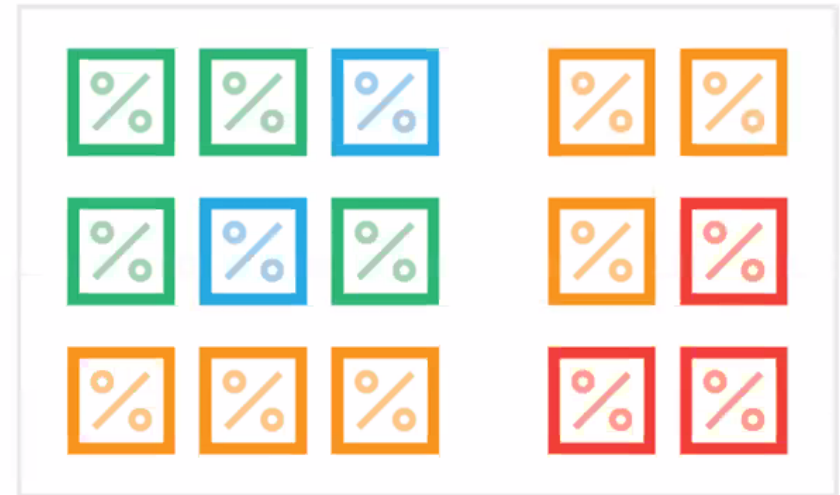
# Shift to Probabilistic Approach

## Deterministic



Structures designated as either inside or outside of special flood hazard areas.

## Probabilistic



Structures assigned specific annualized probabilities of being impacted by flood.



# Legacy Rating Methodology

- FEMA-sourced data
- Rating Variables
  - Flood Zone
  - Base Flood Elevation
  - Foundation Type
  - Structural Elevation (in SFHA)
- 1% Annual Chance of Flooding (single frequency)



# Risk Rating 2.0 Methodology

- FEMA-sourced data + additional data sources
- Cost to rebuild (replacement cost value)
- Rating Variables
  - Distance to flooding source (coast/ocean/river)
  - Stream order
  - Flood type(s) – fluvial, pluvial, etc.
  - Ground Elevation
  - First floor height
  - Construction type/foundation type/number of floors
- Broader range of flood frequencies



# Rating Variables: Construction Type

## ➤ Frame

- Consists of structural components are made of wood or metal and are dependent on the wood/metal frame for support

## ➤ Masonry

- Consists of building structures by laying individual masonry units (brick, concrete block, and/or stone).

## ➤ Other

- Used when the first floor above ground level is constructed with materials other than wood/metal frame or masonry walls for the full story



# Rating Variables: Foundation Types



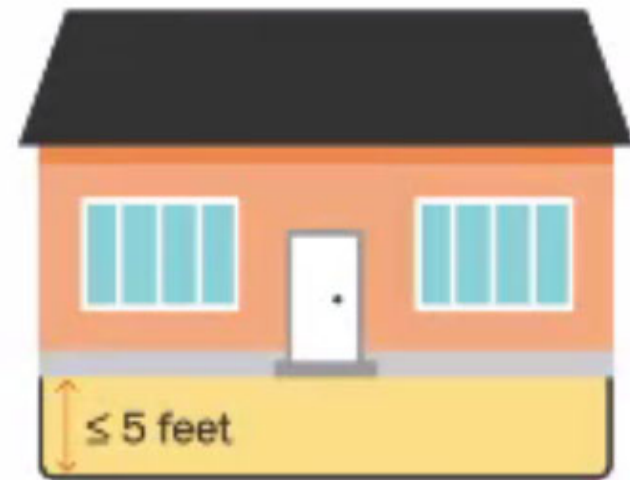
Slab on Grade  
(Non-Elevated)

Includes EC Diagram numbers  
1A, 1B, and 3



Basement  
(Non-Elevated)

Includes EC Diagram numbers  
2A, 2B, and 4



Crawlspace  
(Elevated, including non-elevated  
sub-grade crawlspace)

Includes EC Diagram number 8  
and 9



# Rating Variables: Foundation Types



Elevated without Enclosure on  
Post, Pile, or Pier

Includes EC Diagram number 5



Elevated with Enclosure on  
Post, Pile, or Pier

Includes EC Diagram number 6



Elevated with Enclosure  
Not Post, Pile, or Pier

Includes EC Diagram number 7



# Full-Risk Premium

Building Premium	\$1,100
Contents Premium	\$490
Increased Cost of Compliance (ICC) Premium	\$10
Mitigation Discount	(\$100)
Community Rating System (CRS) Discount	(\$300)
<b>Full-Risk Premium</b>	<b>\$1,200</b>
Statutory Discounts	
Annual Increase Cap	(\$200)
Pre-FIRM Discount	(\$200)
Newly Mapped Discount	\$0
Other Statutory Discounts	\$0
<b>Adjusted Premium</b>	<b>\$800</b>
Reserve Fund Assessment	\$144
Premium [HFIAA] Surcharge	\$25
Federal Policy Fee	\$47
Probation Surcharge	\$0
<b>Total Annual Payment</b>	<b>\$1,016</b>




# Risk Rating 2.0 Impacts to CFS

- Flood Insurance Rate Maps (FIRM) and LOMC will be used for:
  - Floodplain Management
  - Mandatory Purchase Determinations
- Elevation Certificates will be used for:
  - Floodplain Management Compliance
  - Refining Flood Insurance Policy Premiums
  - Community Rating System Prerequisite (Class 9 and better)



# <https://www.fema.gov/flood-insurance/work-with-nfip/risk-rating>

 An official website of the United States government [Here's how you know](#) ▼

[Español](#) [简体中文](#) [Tiếng Việt](#)  ▼



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## Risk Rating 2.0: Equity in Action

FEMA is updating the [National Flood Insurance Program's](#) (NFIP) risk rating methodology through the implementation of a new pricing methodology called **Risk Rating 2.0**. The methodology leverages industry best practices and cutting-edge technology to enable FEMA to deliver rates that are actuarially sound, equitable, easier to understand and better reflect a property's flood risk.



Read the press release: [FEMA Updates Its Flood Insurance Rating Methodology to Deliver More Equitable Pricing](#)

### Floods & Maps

#### Flood Insurance

[Risk Rating 2.0](#)

[Risk Rating 2.0 State Profiles](#)

[Find an Insurance Form](#)

[Work With the National Flood Insurance Program](#)

[Insurance Outreach Publications](#)

[Rules and Legislation](#)

[Flood Insurance Advocate](#)

[Floodplain Management](#)

[Flood Maps](#)



# Additional Resources

- Risk Rating 2.0: Equity in Action fact sheet
  - [https://www.fema.gov/sites/default/files/documents/fema\\_rr-2.0-equity-action\\_0.pdf](https://www.fema.gov/sites/default/files/documents/fema_rr-2.0-equity-action_0.pdf)
- State Specific Profiles
  - <https://www.fema.gov/flood-insurance/work-with-nfip/risk-rating/profiles>
- ASFPM Talking Points
  - <https://www.floods.org/whats-new/risk-rating-2-0-talking-points-and-resources-to-help-you-navigate-the-changes/>



# NC Private Flood Insurance

- Approved by NC Department of Insurance in February 2020
- Coverage for residential property only
- Must equal or exceed NFIP coverage
- Videos from North Carolina Rate Bureau
  - Coverages Overview: <https://vimeo.com/394972753>
  - Rating Overview: <https://vimeo.com/394973057>



# Disaster Recovery Reform Act of 2018

- Principles
  - Increase speed of recovery
  - Enhance compliance with building codes
  - Enhance compliance with NFIP regulations
- Applicability
  - Major Disaster Declarations for PA after 8/1/2017
  - Eligible costs to be reimbursed 75%
  - Need supporting documentation
- Activities associated with non-disaster damaged buildings are not eligible





# DRRA 2018

## Eligible Work Includes:

- Building Code Administration
  - Review and issue permits
  - Maintain records
  - Collect fees
  - Establish and conduct inspections
- Code enforcement
  - Inspect structures
  - Issue condemnation notices
  - Investigate complaints





# DRRA 2018

## Eligible Work Includes:

- Floodplain Ordinance Administration
  - Zone determinations
  - Outreach
  - Monitoring
- Substantial Damage Determinations
  - Triage and compile cost & value information
  - Train staff and perform damage assessments
  - Notify property owners
  - Track cumulative substantial damage
  - Resolve appeals



**North Carolina Emergency Management**





# NC Executive Order 80

## North Carolina's Commitment to Address Climate Change and Transition to a Clean Economy

- By 2025:
  - Reduce greenhouse gas emissions to 40% below 2005
  - Reduce energy consumption to 40% below 2002
  - 80,000 Zero-Emission Vehicles registered
- Integrate Climate Adaption and Resiliency
  - 4' Recommended Freeboard in Model Ordinance



**North Carolina Emergency Management**





# Auto-Adoption

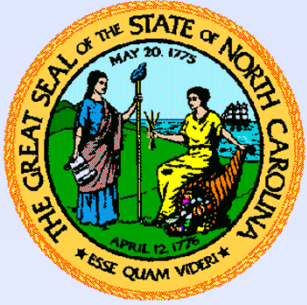
- Chapter 160D of the General Statutes
- In effect January 1, 2021
- Flood Insurance Rate Maps may be incorporated by reference under 160D-105
- Avoid the time and expense of local government action to amend maps to incorporate updates that cannot be amended
- Comments and appeals still occur











# North Carolina Floodplain Mapping Program Updates

April 29, 2022



North Carolina Emergency Management  
Floodplain Management Section



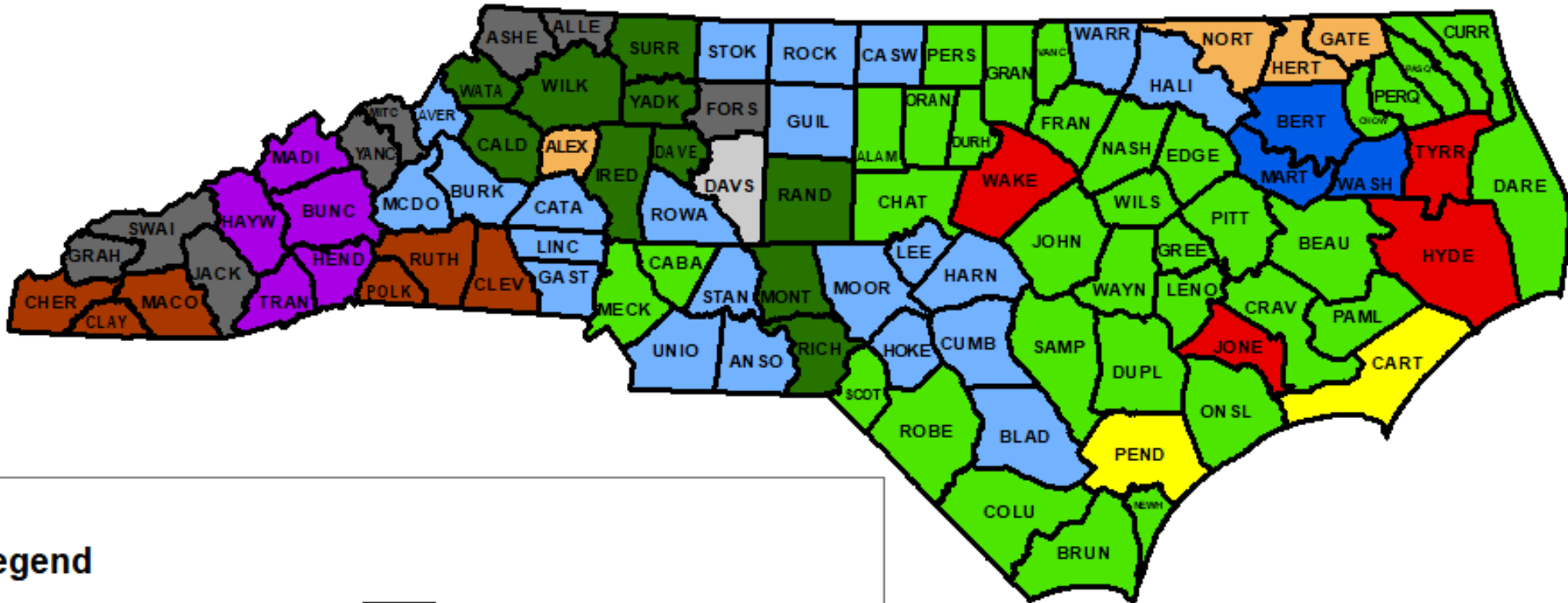


# Topics

- Flood Map Status
- New NC Web-based Tools
- National Flood Hazard Layer (NFHL) Viewer
- FEMA Flood Map Service Center
  - New FIRMette Tool















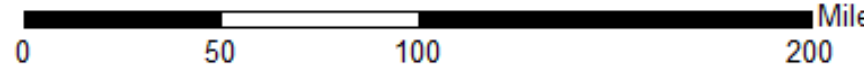
# Flood Map Status (as of 4/4/2022)



### Legend

## NCFMP Status

- |   |  |
|---|--|
|  Effective: Post 2013     |  Survey                     |
|  Preliminary              |  Hydrology                  |
|  Ready For LFD            |  H&H                        |
|  Current LFD Period       |  Flood Database Review      |
|  Approved For Preliminary |  Flood Database Approved    |
|  Revised Preliminary      |  Risk only Rasters Approved |





# Flood Map Status

## Upcoming Effective Dates

### ➤ Effective:

- N/A

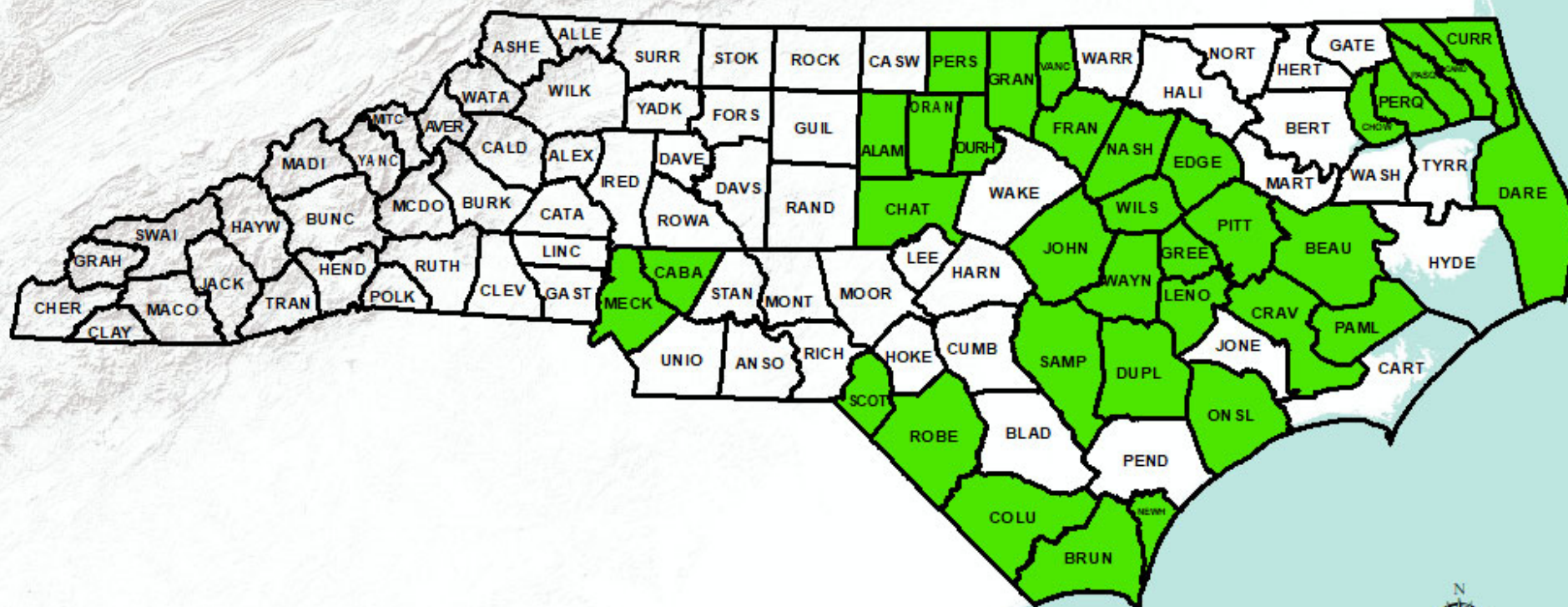
### ➤ Upcoming:

- June 15, 2022: Jones, Hyde, and Tyrrell Counties
- July 19, 2022: Wake County



## Effective Under Map Maintenance (2nd Statewide Mapping)

Date: 4/21/2022

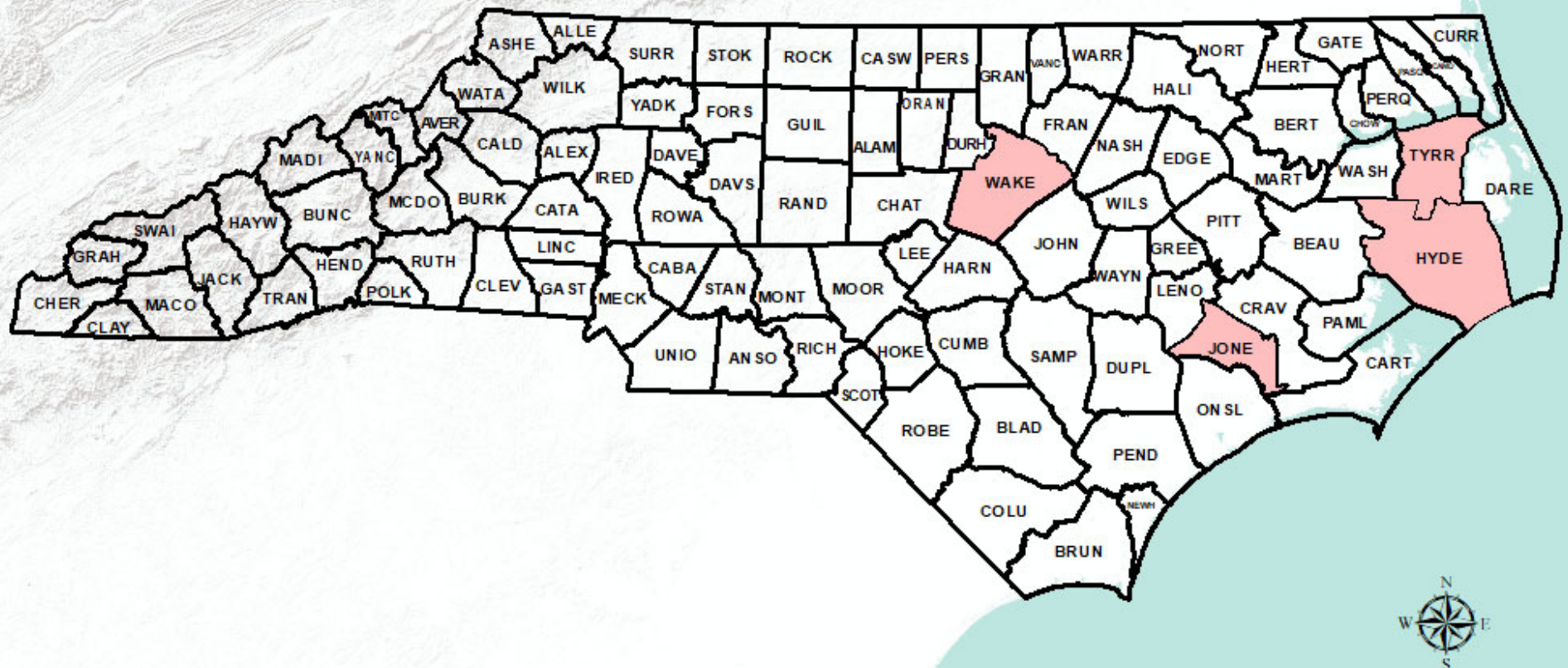


A horizontal number line representing distance in miles. It has tick marks at 0, 45, 90, and 180. The word "Miles" is written at the right end.



## Letter of Final Determination (LFD) in Process

Date: 4/21/2022



0 45 90 180 Miles





# Flood Map Status

## Upcoming Preliminary Issuance Dates

### ➤ Issued

- July 30, 2021: Carteret and Pender Revised Prelims
- September 30, 2021: Bertie, Martin, Washington

### ➤ Upcoming:

- May 25, 2022 (Tentative): Halifax, Warren
- 2022: Caswell, Guilford, Rockingham, Stokes
- 2022/2023: Anson, Montgomery, Randolph, Richmond, Rowan, Stanly, Surry, Union, Wilkes, Yadkin
- 2023: Alexander, Avery, Burke, Caldwell, Catawba, Gaston, Iredell, Lincoln, McDowell
- 2023: Bladen, Cumberland, Harnett, Hoke, Lee, Moore



# Current Preliminary

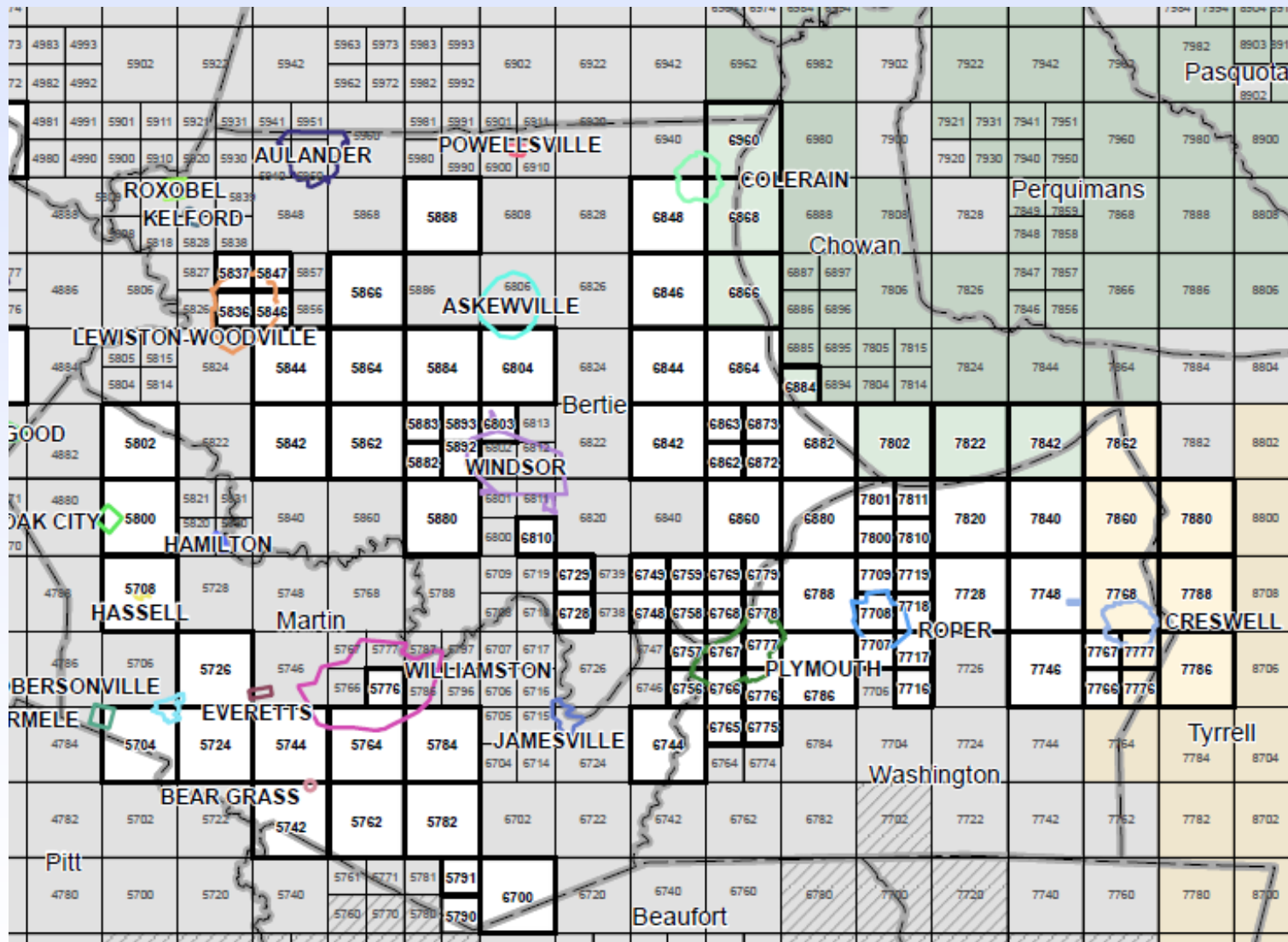
Date: 4/21/2022



0 45 90 180 Miles



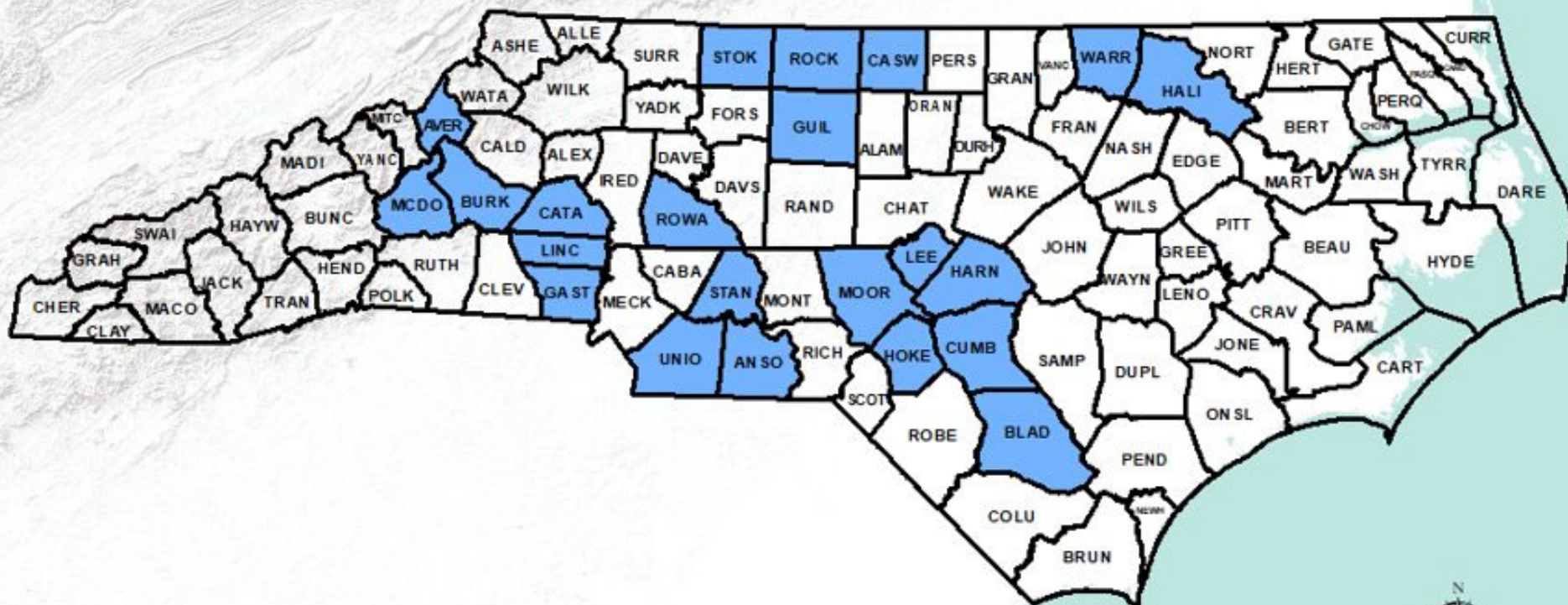
# Preliminary Issuance September 30, 2021





# Approved for Draft Release

Date: 4/21/2022

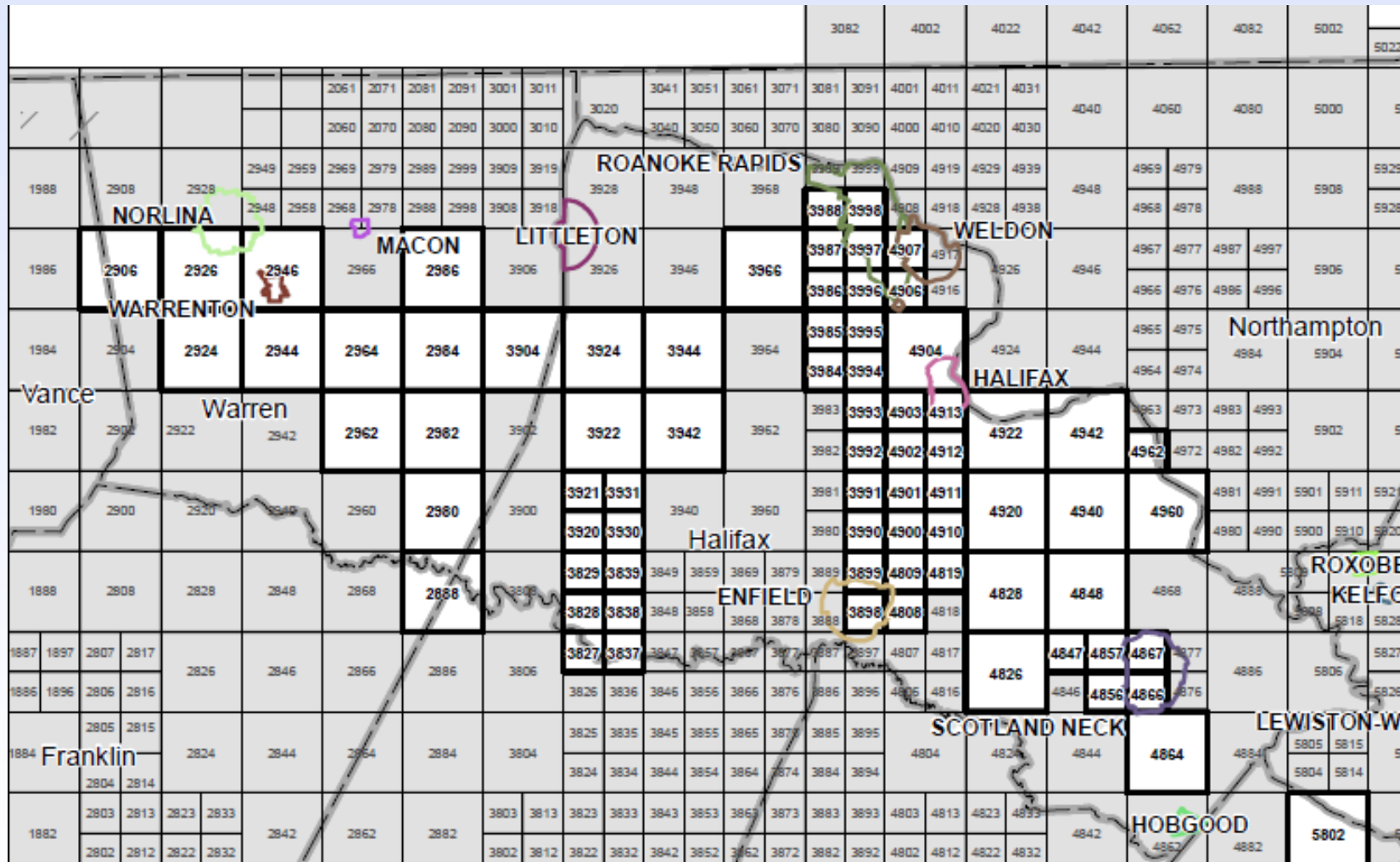


0 45 90 180 Miles





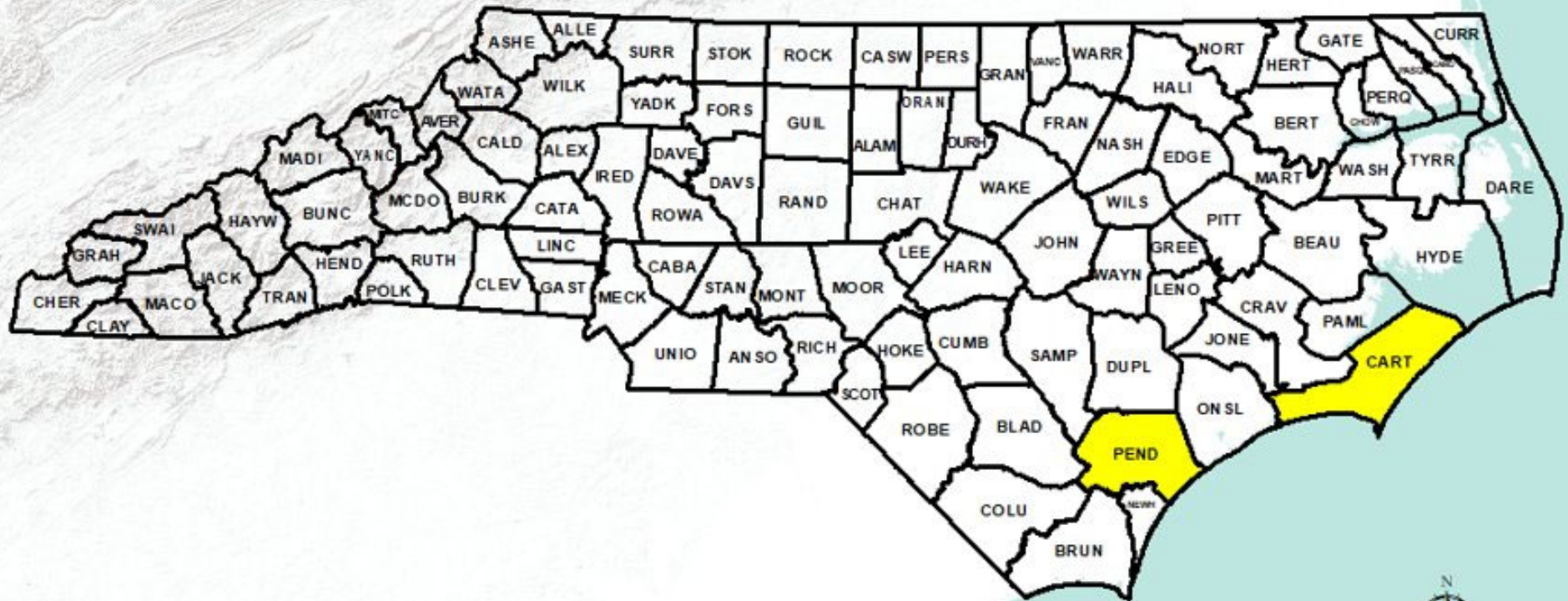
# Preliminary Issuance May 2022 (Tentative)





## Revised Preliminary in Progress

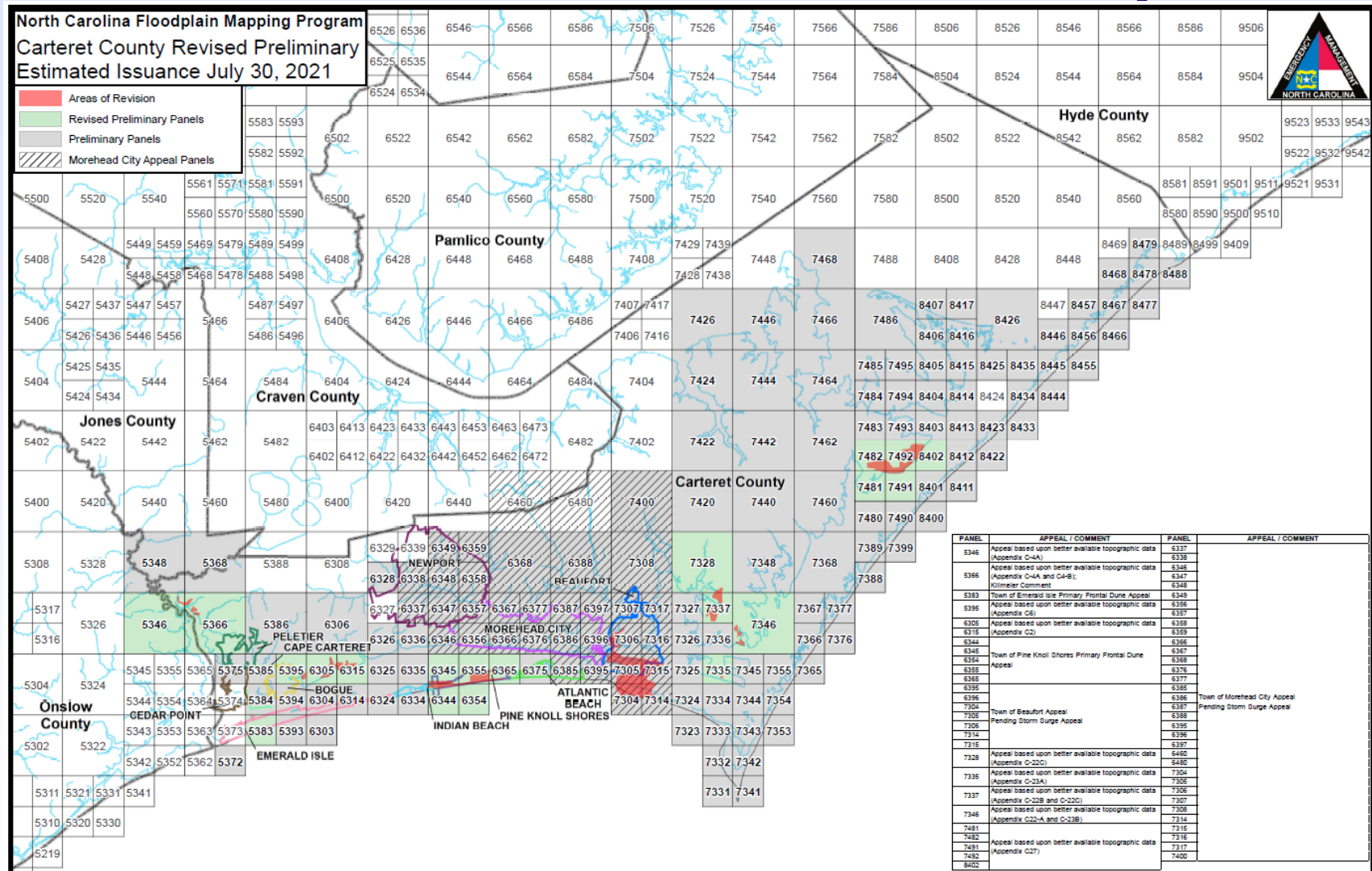
Date: 4/21/2022



0 45 90 180 Miles

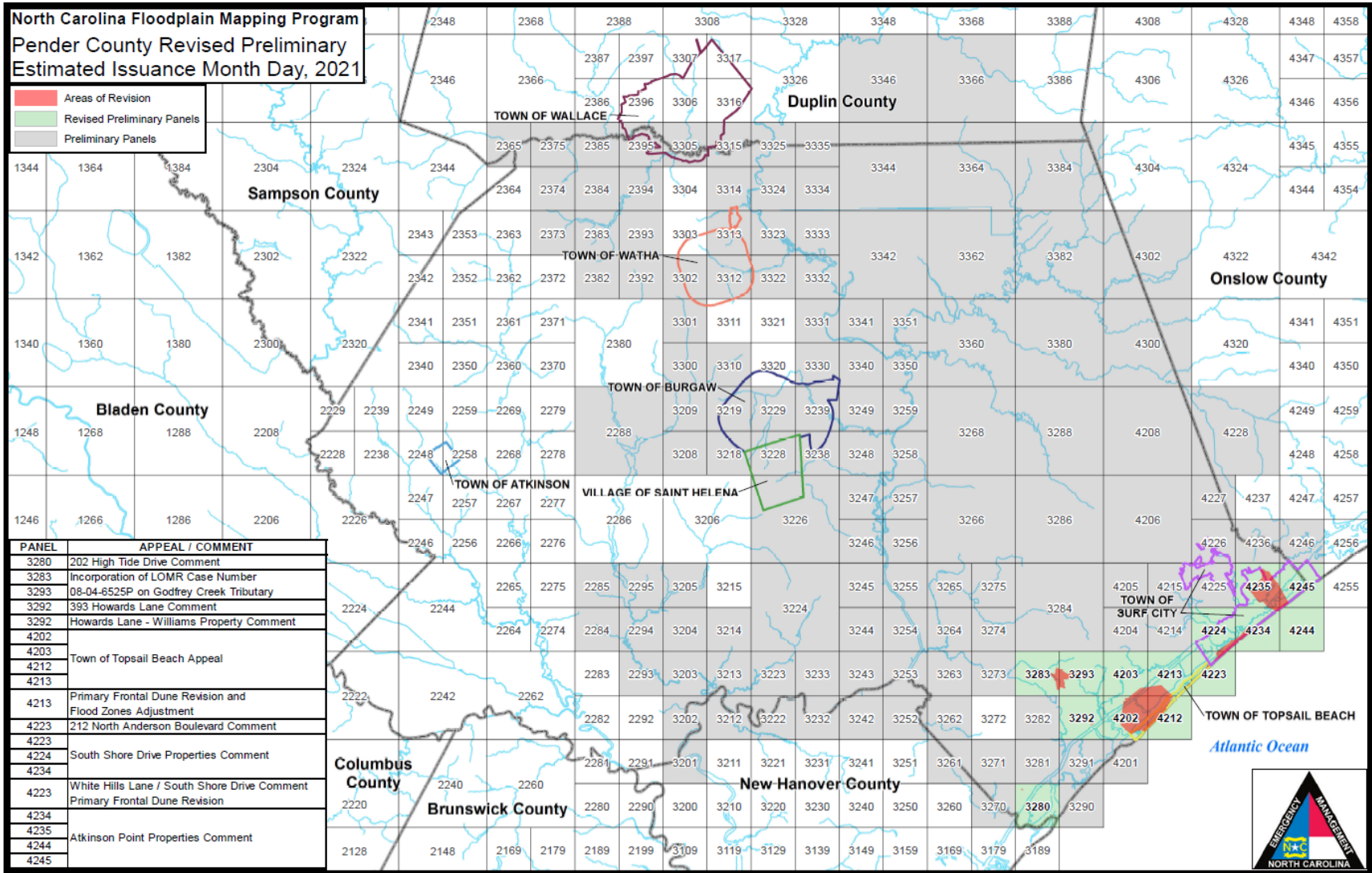


# Carteret Revised Preliminary





# Pender Revised Preliminary



**North Carolina Emergency Management**  
**Floodplain Management Section**





# NCFMP FIS Report Profiles

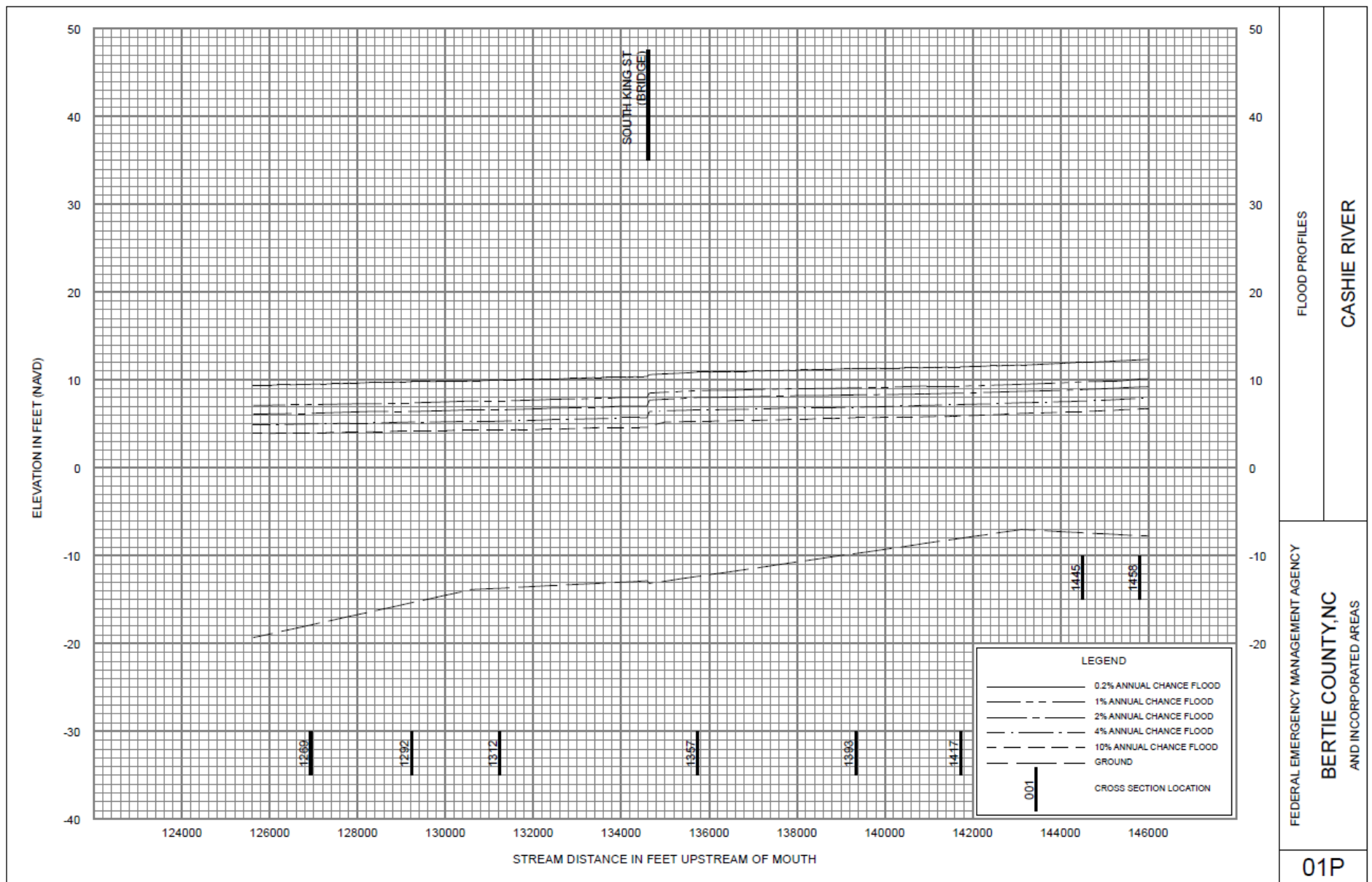
- The NCFMP developed an automated profile tool for updated FIS reports.
- New preliminary issuances will contain profiles.



**North Carolina Emergency Management  
Floodplain Management Section**







## North Carolina Emergency Management Floodplain Management Section





# FIS Report Section 4.5 - Table 12

## Incorporated Letters of Map Revision (LOMCs)

- When **Table 12, Incorporated Letters of Map Change (LOMCs)** is included in the FIS Report, this paragraph will be inserted **above** the Table 12.
- Please note that this **Table 12, Incorporated Letters of Map Change (LOMCs)**, only includes LOMCs that have been issued on the FIRM panels updated by this map revision. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.



**North Carolina Emergency Management  
Floodplain Management Section**





# FIS Report Section 4.5 - Table 12

## Incorporated Letters of Map Revision (LOMCs)

This FIS also incorporates the determinations of letters issued by FEMA resulting in map changes (Letters of Map Revision [LOMRs]), as shown in Table 12, "Letters of Map Revision".

Please note that this Table 12, Incorporated Letters of Map Change (LOMCs), only includes LOMCs that have been issued on the FIRM panels updated by this map revision. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.

**Table 12 – Incorporated Letters of Map Change (LOMCs)**

Case Number	Date Issued	Flooding Source/Description	Communities
11-04-0418P	3/17/2011	Camping Creek / 11-04-0418P	Franklin County





# FIS Report Section 4.5 - Table 12

## Incorporated Letters of Map Revision (LOMCs)

- When **Table 12, Incorporated Letters of Map Change (LOMCs)** is not applicable, insert this paragraph under the “not applicable” statement:
- Please note that **Table 12, Incorporated Letters of Map Change (LOMCs)**, only includes LOMCs that have been issued on the FIRM Panels updated in any given revision. Table 12 is not applicable to this FIS Report as there were no LOMCs issued on the FIRM Panels updated in this report. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.



**North Carolina Emergency Management  
Floodplain Management Section**





# FIS Report Section 4.5 - Table 12

## Incorporated Letters of Map Revision (LOMCs)

Table 12, "Letters of Map Revision" is not applicable in Halifax County.

Please note that **Table 12, Incorporated Letters of Map Change (LOMCs)**, only includes LOMCs that have been issued on the FIRM Panels updated in any given revision. Table 12 is not applicable to this FIS Report as there were no LOMCs issued on the FIRM Panels updated in this report. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.



**North Carolina Emergency Management  
Floodplain Management Section**





# NCFMP Proposed Preliminary Flood Data Review Site



Sign In



NC Floodplain Mapping Program Proposed Preliminary Data Viewer

North Carolina Risk Management  
Proposed Preliminary Flood Data Review

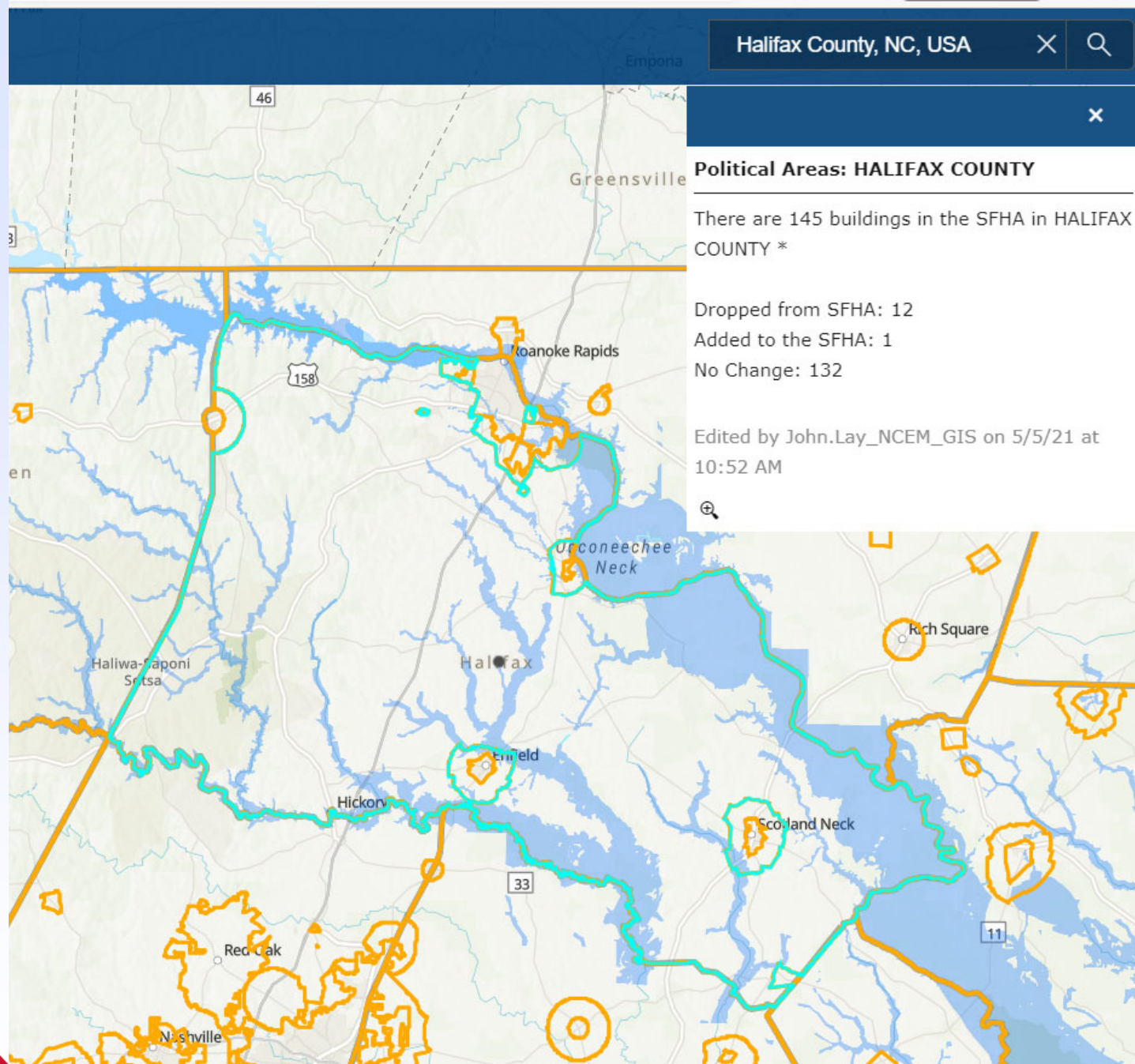
Preview Your New  
Proposed Preliminary Maps



North Carolina Emergency Management  
Floodplain Management Section







## North Carolina Emergency Management Floodplain Management Section

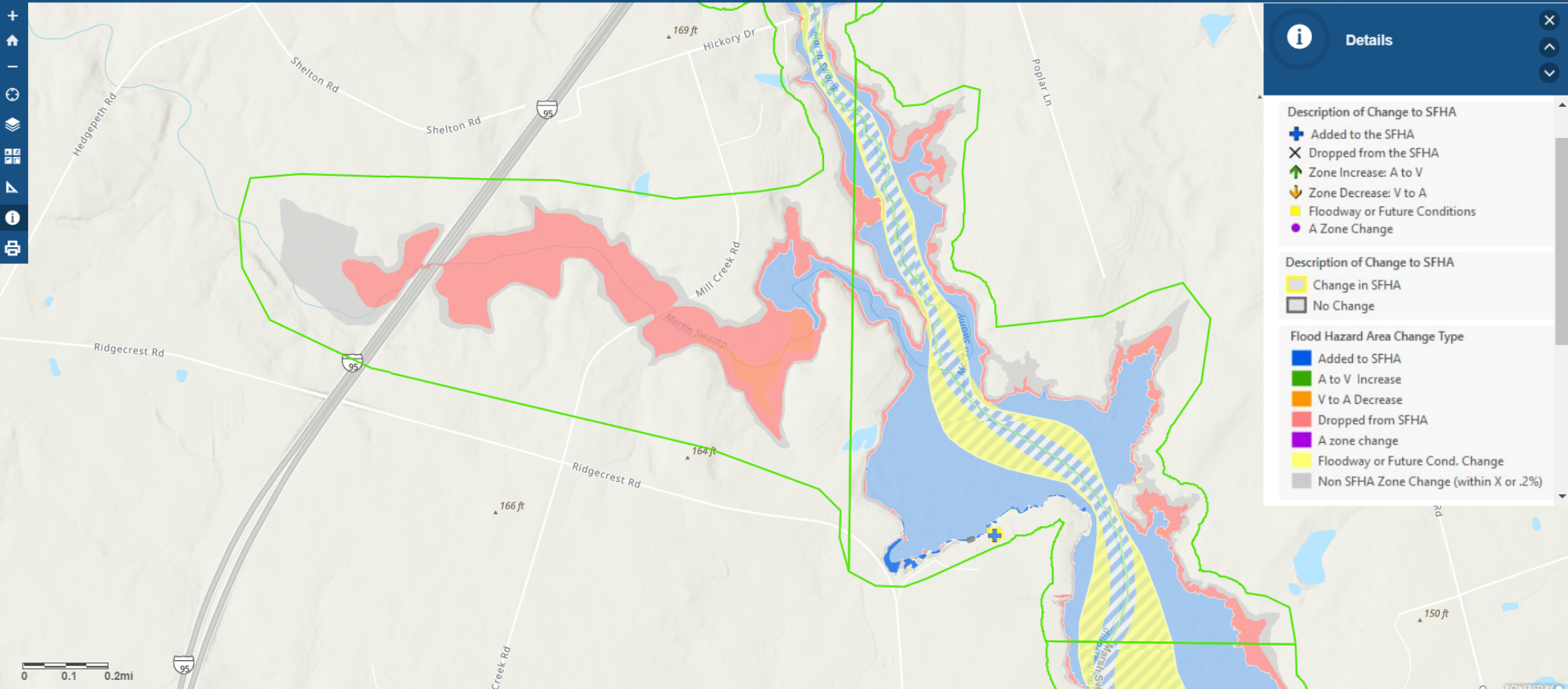




Buildings And Changes Since Last Firm

[Back to Main Page](#)

Halifax County, NC, USA



North Carolina Emergency Management  
Floodplain Management Section





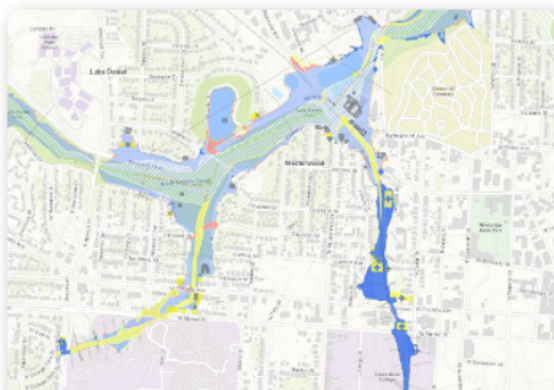


Sign In



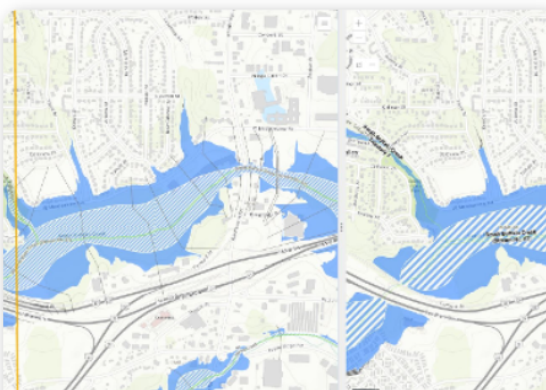
## NC Floodplain Mapping Program Proposed Preliminary Data Viewer

View, Analyze, and Comment on the Proposed Data



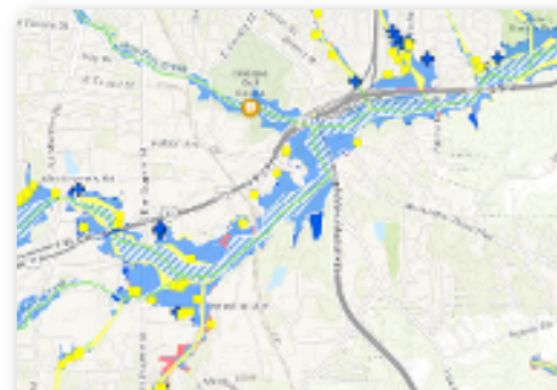
SFHA and Buildings Changes Map:  
Proposed Preliminary Review

Open



Proposed Preliminary Review:  
Comparison Map  
Preliminary Review of DFIRM data prior to Due  
Process Preliminary period

Open



Preliminary Review Comment  
Submission Form

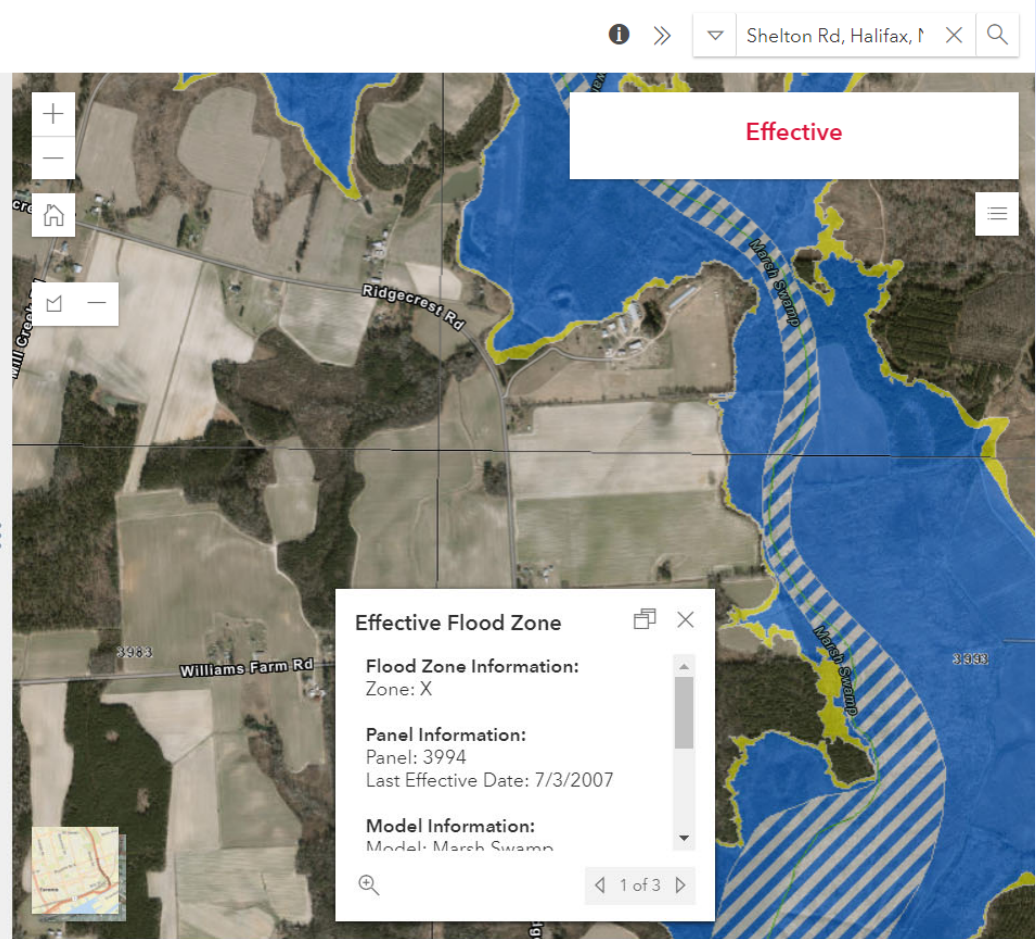
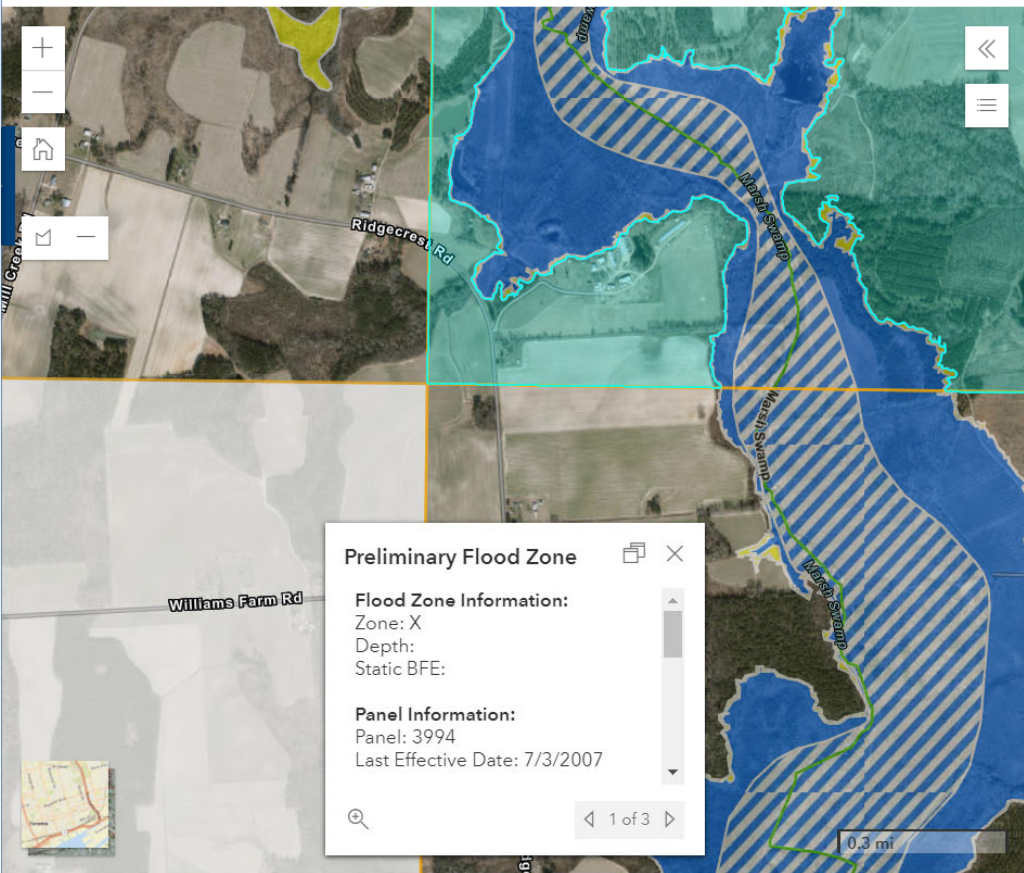
Open



**North Carolina Emergency Management  
Floodplain Management Section**









# FEMA's National Flood Hazard Layer (NFHL) Viewer

FEMA's National Flood Hazard Layer (NFHL) Viewer with Web AppBuilder for ArcGIS

Find address or place

Print Flood Map

Input Output

To print NFHL FIRMette or Full FIRM:

- 1) Click the pin tool, and click on the map to place the pin.
- 2) Choose to create a print-size FIRMette or full-size FIRM.
- 3) Press "Execute" - The process may take up to 1 minute.\*

Size\* FIRMETTE

File Format\*

Welcome to the National Flood Hazard Layer (NFHL) Viewer!

The National Flood Hazard Layer (NFHL) dataset represents the current effective flood data for the country, where maps have been modernized. It is a compilation of effective Flood Insurance Rate Map (FIRM) databases and Letters of Map Revision (LOMRs). The NFHL is updated as studies go effective. For more information, visit FEMA's Map Service Center (MSC).

The default base map conforms to FEMA's specification for horizontal accuracy. This map should be considered the best online resource to use for official National Flood Insurance Program (NFIP) purposes when determining locations in relation to regulatory flood hazard information. If a different base map is used with the NFHL, the accuracy specification may not be met and the resulting map should be used for general reference only, and not official NFIP purposes. For FEMA's policy on the use of digital flood hazard data for NFIP purposes see [Standards for Flood Risk Products](#).

Questions? [Contact a map specialist](#).

☐ Do not show this splash screen again.

OK

App State

Click to restore the map extent and layers visibility where you left off.

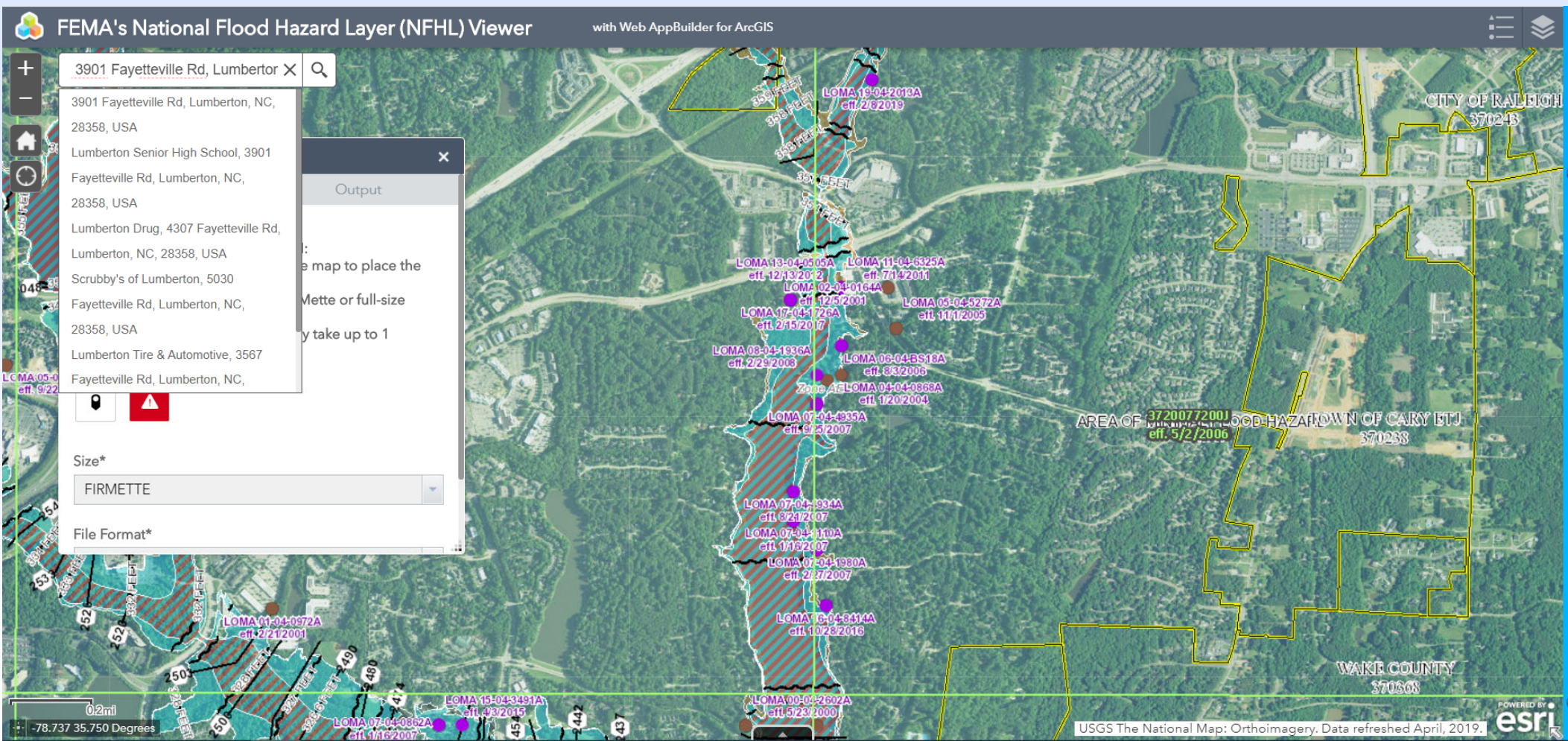
USGS The National Map: Orthoimagery



**North Carolina Emergency Management  
Floodplain Management Section**







## North Carolina Emergency Management Floodplain Management Section





FEMA's National Flood Hazard Layer (NFHL) Viewer with Web AppBuilder for ArcGIS



3901 Fayetteville Rd, Lumberton X

3901 Fayetteville Rd, Lumberton, NC, 28358, USA

**Print Flood Map**

Input Output

To print NFHL FIRMette or Full FIRM:  
1) Click the pin tool, and click on the map to place the pin.  
2) Choose to create a print-size FIRMette or full-size FIRM.  
3) Press "Execute" - The process may take up to 1 minute.\*

Size\*  
FIRMETTE

File Format\*

**Search result**

3901 Fayetteville Rd, Lumberton, NC, 28358, USA

[Zoom to](#)

eff. 12/6/2019

CITY OF LUMBERTON 370203

Zone AE

FLOODWAY Zone AE

Zone AH (EL 132 Feet)

CITY OF LUMBERTON ETJ 370203

Esri, USDA Farm Service Agency

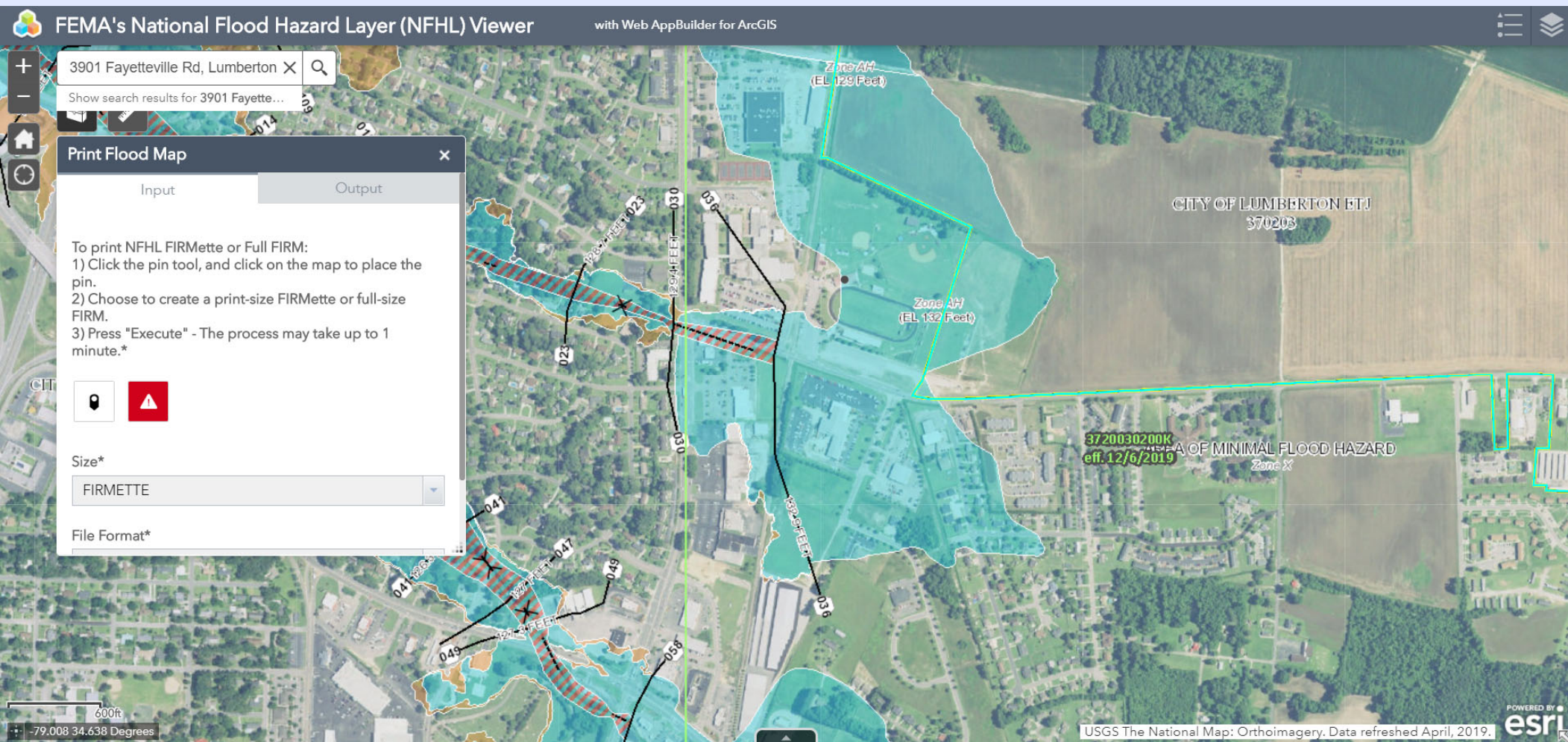
POWERED BY esri



## North Carolina Emergency Management Floodplain Management Section



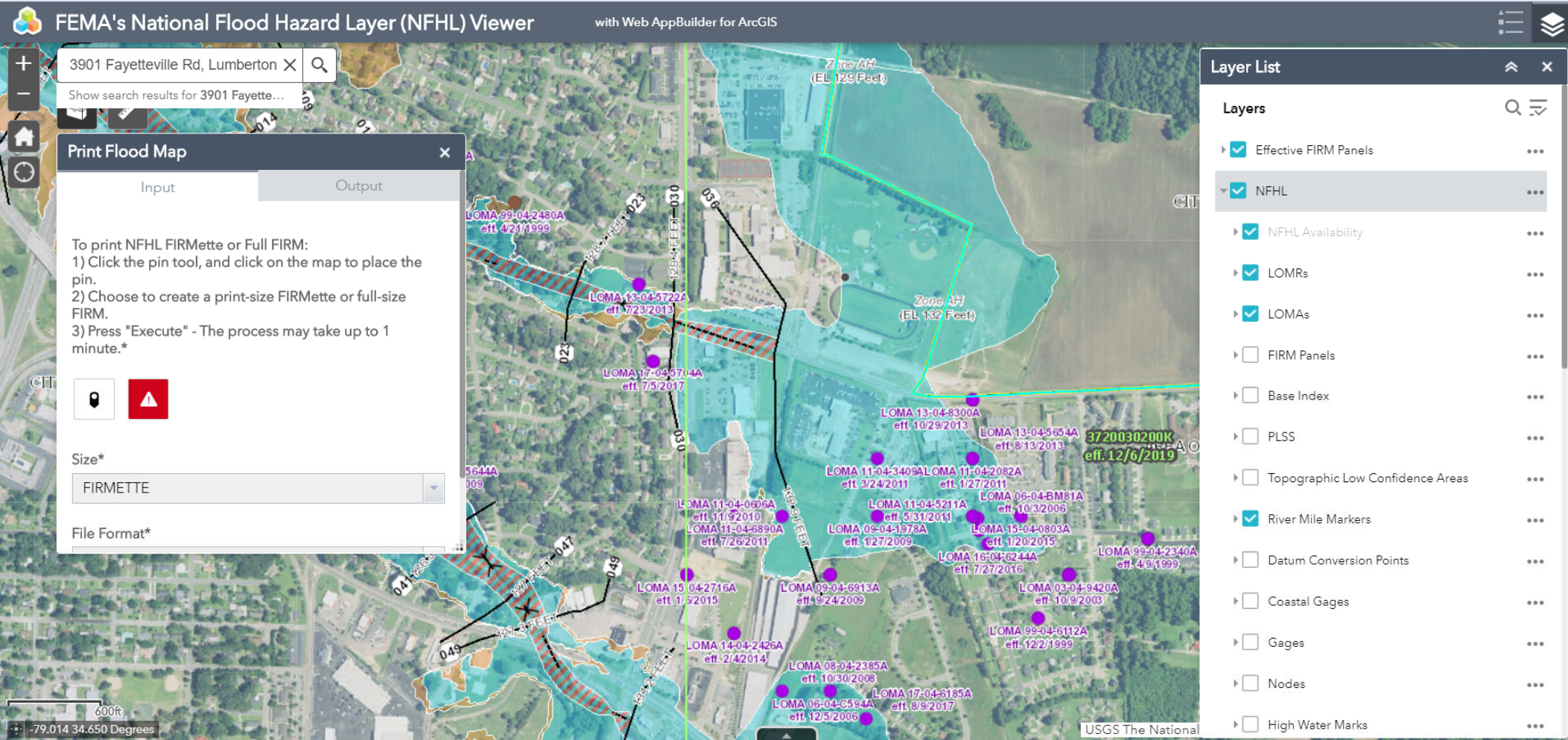




North Carolina Emergency Management  
Floodplain Management Section









FEMA's National Flood Hazard Layer (NFHL) Viewer with Web AppBuilder for ArcGIS

3901 Fayetteville Rd, Lumberton X

Show search results for 3901 Fayette...

**Print Flood Map**

Input Output

To print NFHL FIRMette or Full FIRM:  
 1) Click the pin tool, and click on the map to place the pin.  
 2) Choose to create a print-size FIRMette or full-size FIRM.  
 3) Press "Execute" - The process may take up to 1 minute.\*

Size\*  
 FIRMETTE

File Format\*

Layer List

- Effective FIRM Panels
- NFHL
- NFHL Availability
- LOMRs
- LOMAs
- FIRM Panels
- Base Index
- LSS
- Topographic Low Confidence Areas
- River Mile Markers
- Datum Conversion Points
- Coastal Gages
- Gages
- Codes
- High Water Marks

(1 of 4)

LOMAs: CLIFFRIDGE SUBDIVISION, SECTION II-B, LOT 24 -- 3610 HILLCREST DRIVE

**Letter of Map Amendment (LOMA)**  
 point locations are approximate. The location of the LOMA is referenced in the legal description of the letter itself: [Download Letter Here](#).  
 Revalidation letters can be found at <https://msc.fema.gov> by using Search All products, selecting your community, and accessing the "Effective Products" and "LOMC" folders.  
 All LOMA revalidation statuses are for informational purposes only. For [Zoom to](#)

USGS The National



## North Carolina Emergency Management Floodplain Management Section







# Federal Emergency Management Agency

Washington, D.C. 20472

## LETTER OF MAP AMENDMENT DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF LUMBERTON, ROBESON COUNTY, NORTH CAROLINA	Lot 24, Cliffridge Subdivision, Section II-B, as described in the Quit Claim Deed recorded as Document No. 2012009923, in Book D1879, Pages 356, 357, and 358, in the Office of the Register of Deeds, Robeson County, North Carolina
	COMMUNITY NO.: 370203	
AFFECTED MAP PANEL	NUMBER: 3720030200J	
	DATE: 1/19/2005	
FLOODING SOURCE: MEADOW BRANCH		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 34.641530, -78.993694 SOURCE OF LAT & LONG: LOMA LOGIC DATUM: NAD 83

### DETERMINATION

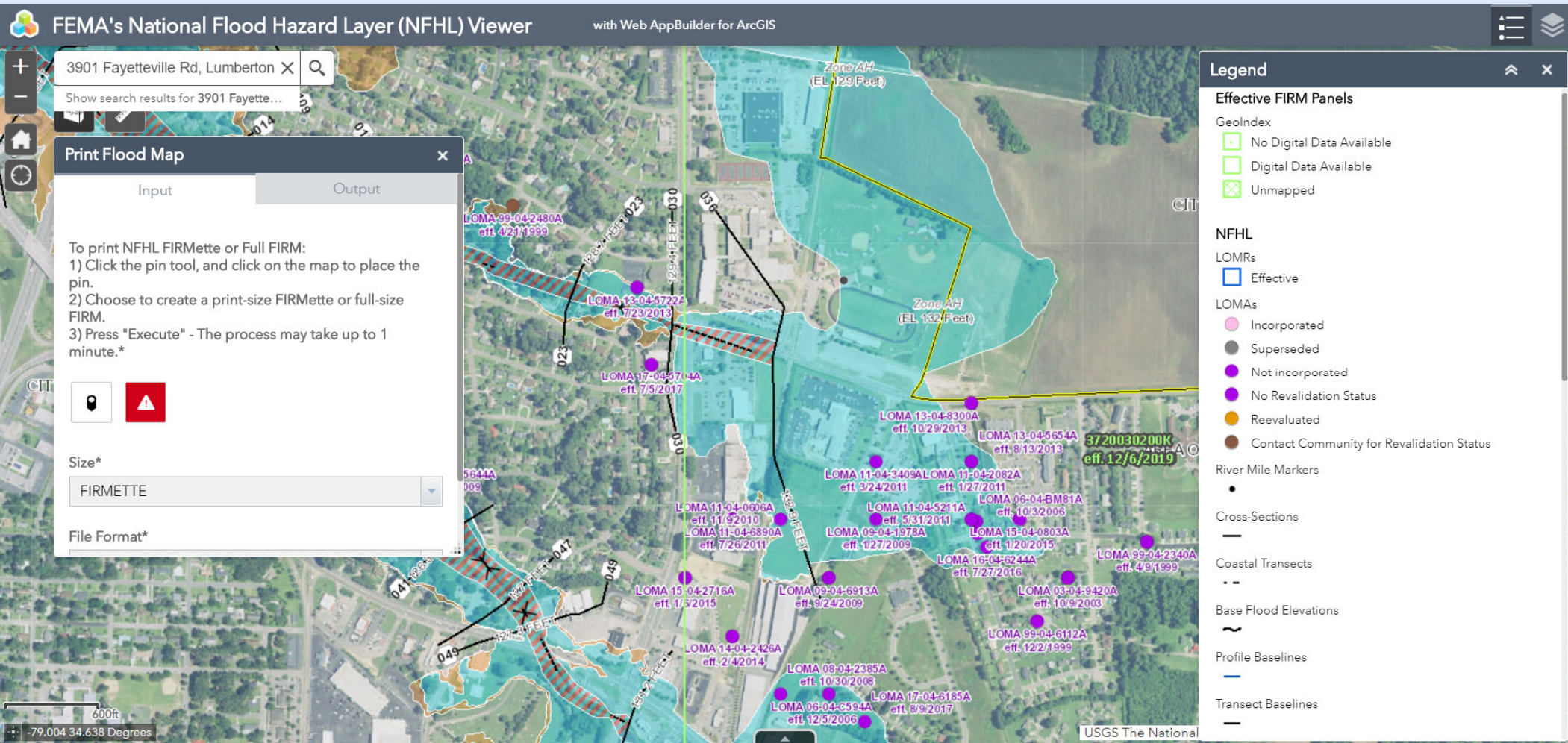
LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
24	-/II-B	Cliffridge	3610 Hillcrest Drive	Structure (Residence)	X (unshaded)	--	132.1 feet	--

**Special Flood Hazard Area (SFHA)** - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

PORTIONS REMAIN IN THE SFHA







**FEMA's National Flood Hazard Layer (NFHL) Viewer**
with Web AppBuilder for ArcGIS

3901 Fayetteville Rd, Lumberton X

Show search results for 3901 Fayette...

To print NFHL FIRMette or Full FIRM:  
1) Click the pin tool, and click on the map to place the pin.  
2) Choose to create a print-size FIRMette or full-size FIRM.  
3) Press "Execute" - The process may take up to 1 minute.\*

Size\*  
FIRMETTE

File Format\*  
600ft

GeoIndex
NFHL Availability
LOMRs
LOMAs
River Mile Markers
Cross-Sections
Coastal Transects
Base Flood Elevations
Profile Baselines
Transect Baselines
Limit of Moderate Wave Action
Political Jurisdictions
Levees
General Structures

Options
Filter by map extent
Zoom to
Clear selection
Refresh

CASENUMBER	STATUS	PROJECTNAME	PROJECTCATEG	DATEENDED	DATEENDEDSTR	CID	COMMUNITYNAM	DETERMINATION	LAT	LON	PDFHYPERLINKID	REVAL_STAT	LOTTYPE	OUTCOME
03-04-7940A	Completed	LOT 61, INVERNESS S/D, SECTION ONE - 212 TARTAN ROAD	LOMA	7/17/2003, 8:00 PM		370203	LUMBERTON, CITY OF	DetermLetter	34.65	-79.01	03-04-7940A-370203	Not incorporated	Single lot	Structure removed-Property partially inundated

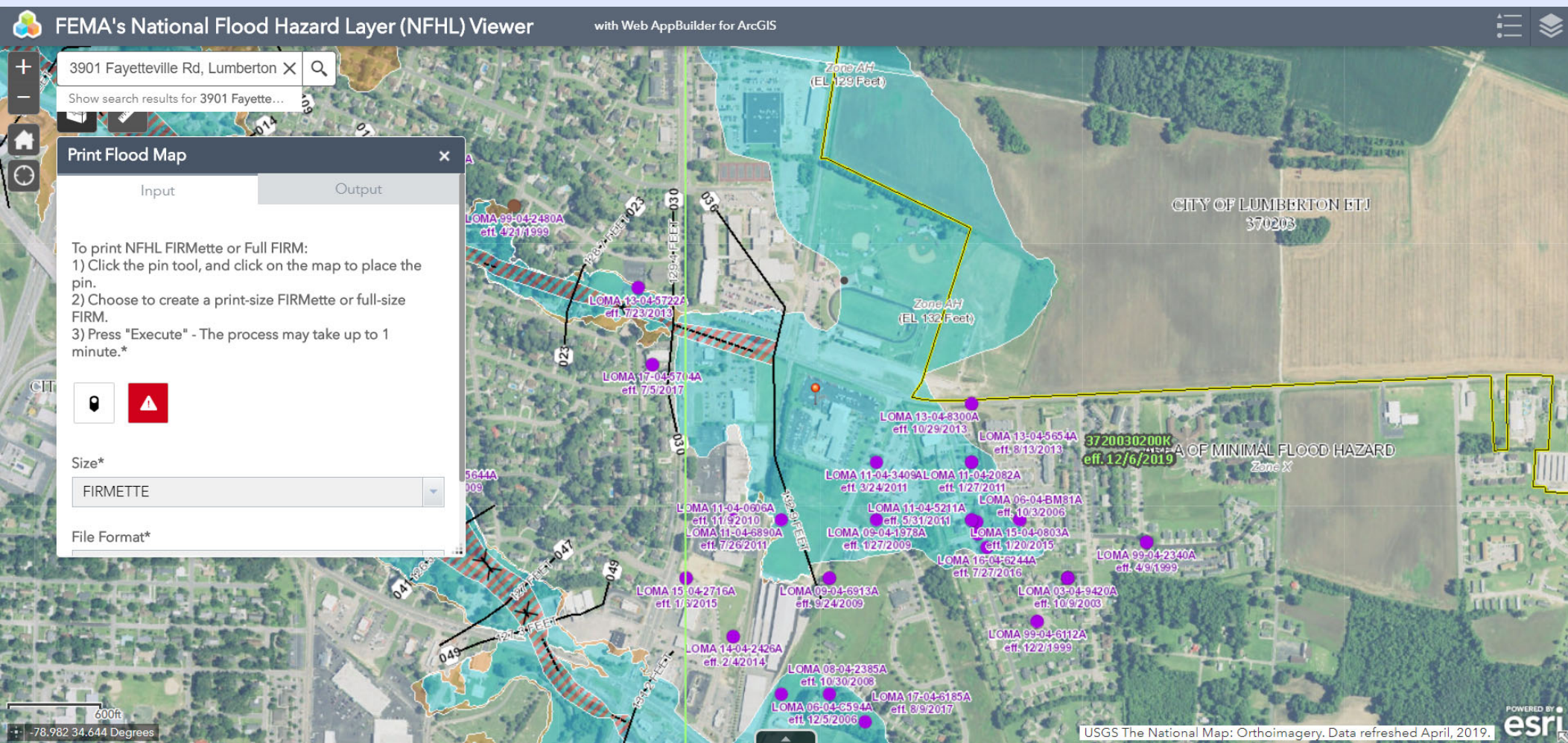
11 features 0 selected



## North Carolina Emergency Management Floodplain Management Section



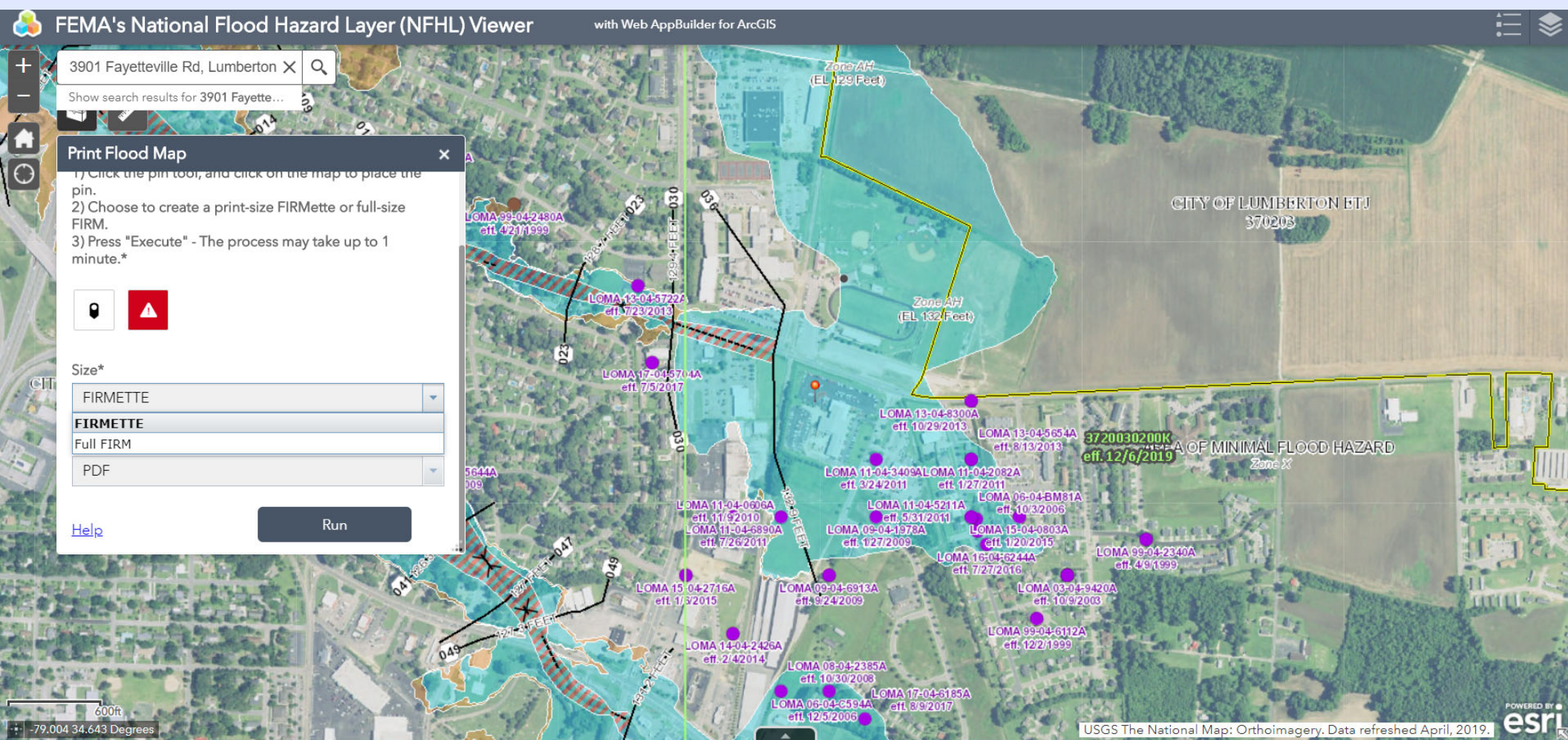




## North Carolina Emergency Management Floodplain Management Section



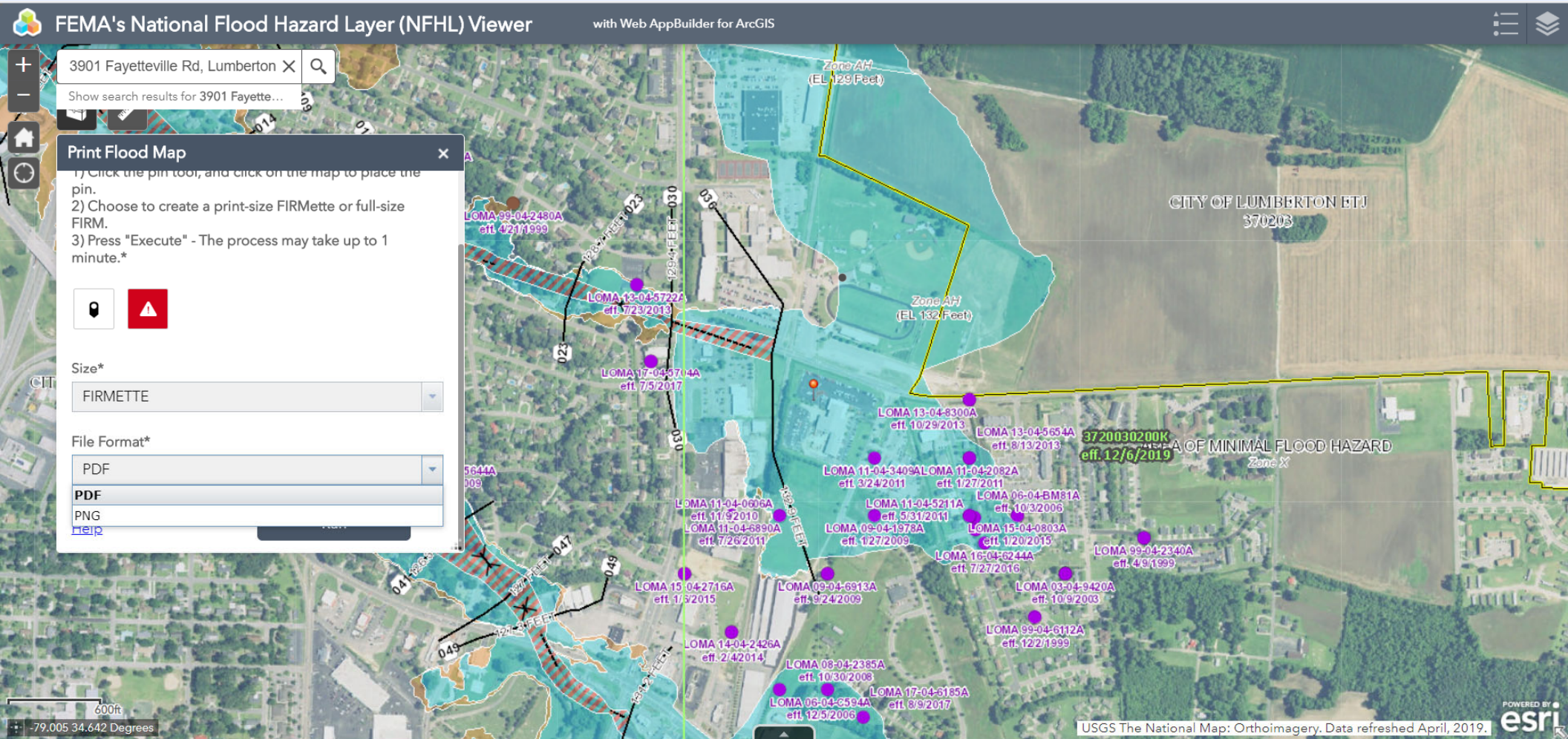




## North Carolina Emergency Management Floodplain Management Section



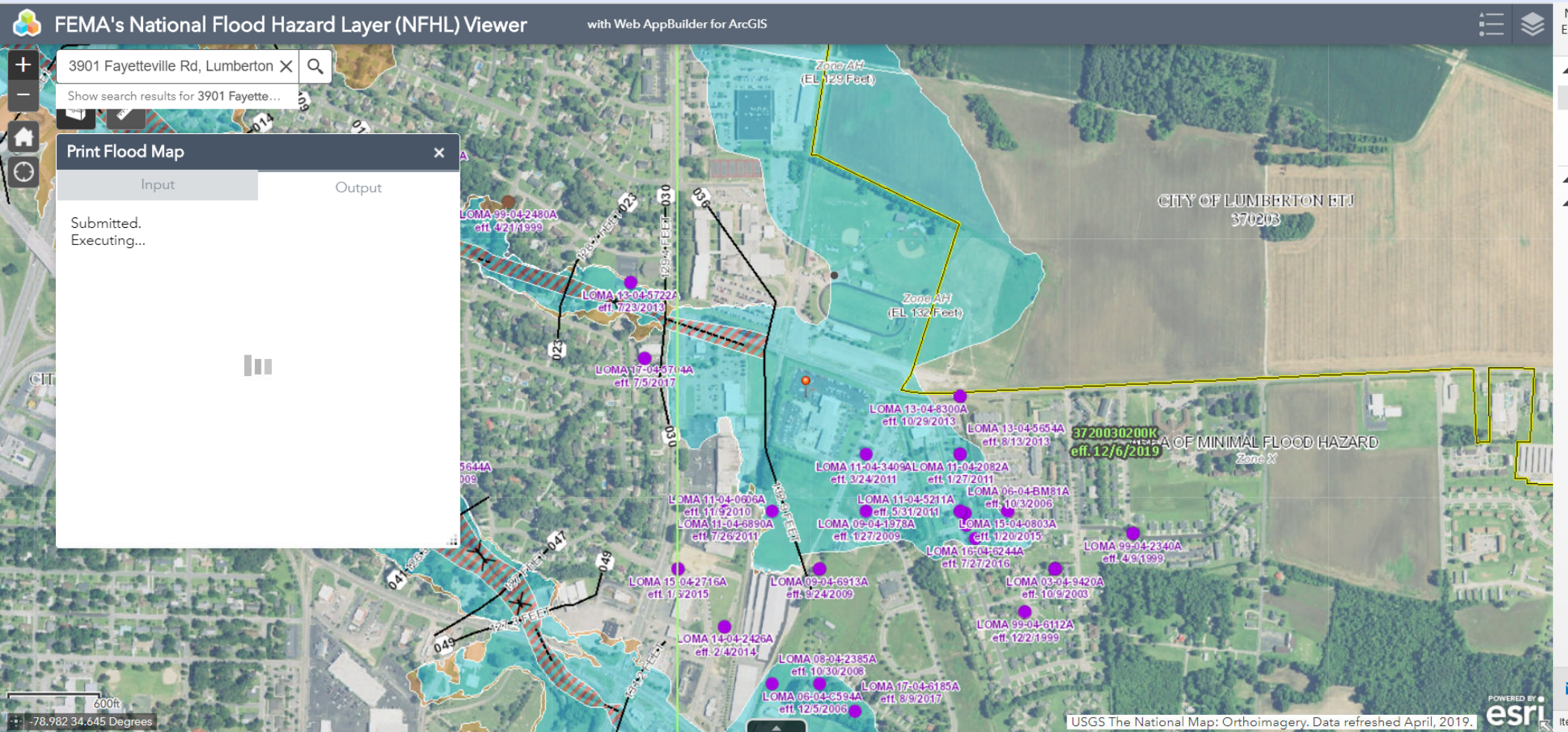




## North Carolina Emergency Management Floodplain Management Section



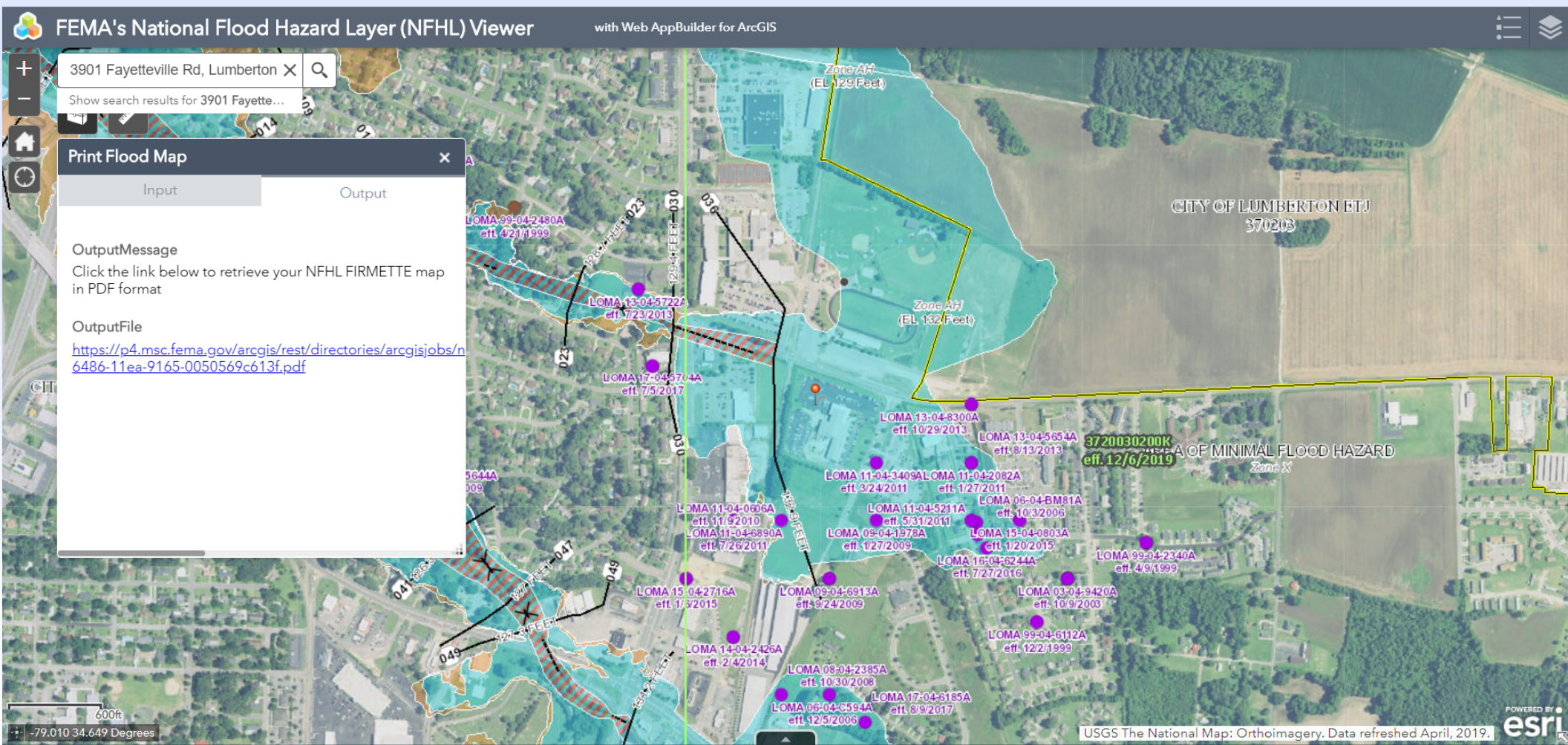




## North Carolina Emergency Management Floodplain Management Section







## North Carolina Emergency Management Floodplain Management Section

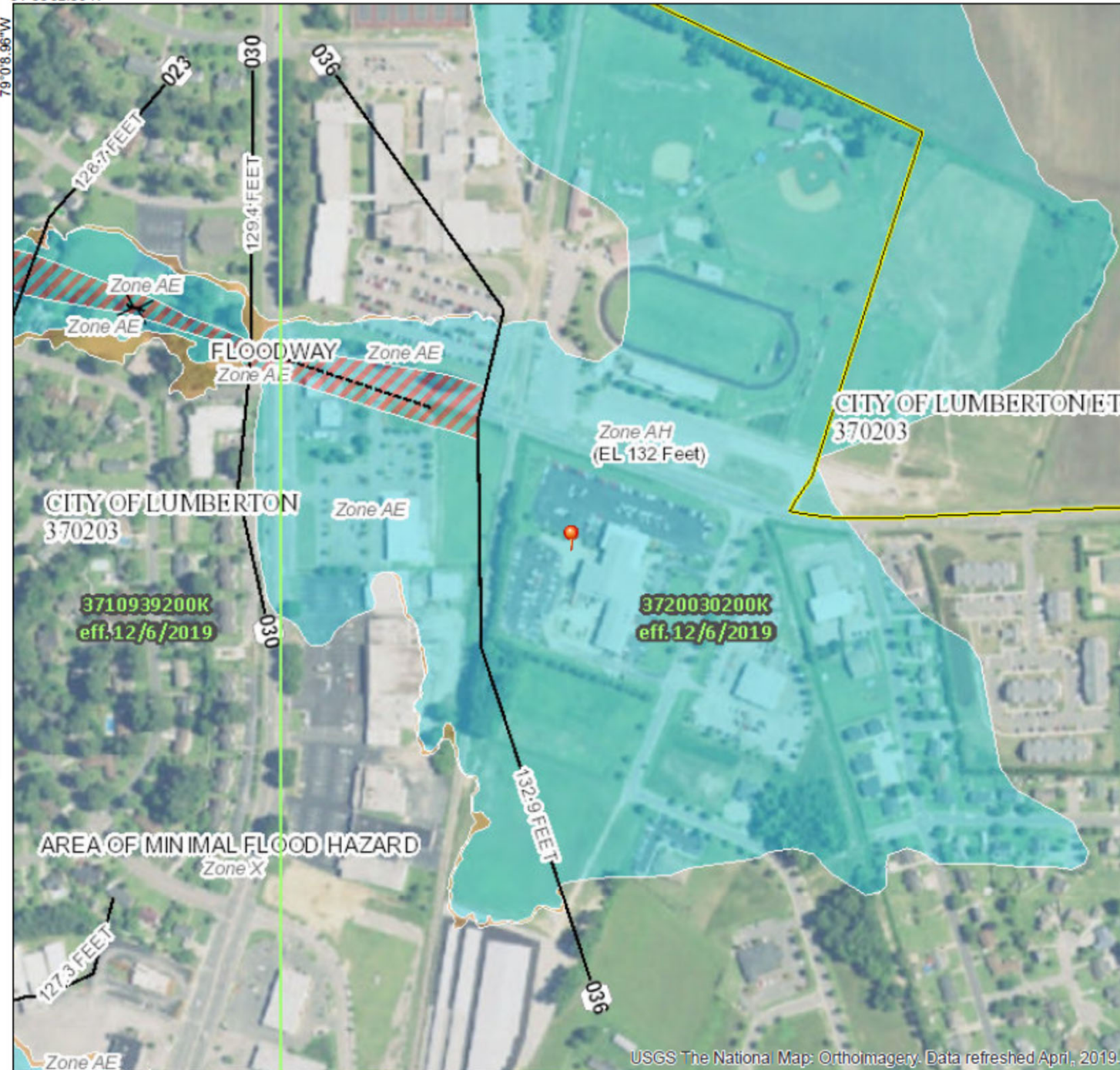




# National Flood Hazard Layer FIRMeTte



34°38'52.89"N



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AD, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes, Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/12/2020 at 1:23:38 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

34°38'23.29"N

78°59'31.50"W



# FEMA's Flood Map Service Center

## <https://msc.fema.gov/portal/home>

### FEMA Flood Map Service Center: Welcome!

FEMA has introduced an update to the online FIRMette Web tool that is now available on the MSC. Directions on how to interact with the new tool and create a FIRMette are available in the [How to Find and Make a FIRMette tutorial](#). If further assistance is required, please contact the FEMA Mapping and Insurance eXchange (FMIX) at [FEMA-FMIX@fema.dhs.gov](mailto:FEMA-FMIX@fema.dhs.gov).

Looking for a Flood Map? [?](#)

**Enter an address, a place, or longitude/latitude coordinates:**

Looking for more than just a current flood map?

Visit [Search All Products](#) to access the full range of flood risk products for your community.



### About Flood Map Service Center

The FEMA Flood Map Service Center (MSC) is the official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP). Use the MSC to find your official flood map, access a range of other flood hazard products, and take advantage of tools for better understanding flood risk.



# FEMA Flood Map Service Center: Search All Products

Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction

**State**

NORTH CAROLINA

**County**

WAKE COUNTY

**Community**

WAKE FOREST, TOWN OF

Jurisdiction Name

**Jurisdiction Name or FEMA ID**

(Ex. Fairfax County-wide or 51059C)

Product ID 

**Product ID**

(Ex. Panel Number, LOMC Case Number)

> Filter By Posting Date Range (*Optional*)

Search

Clear All Fields



Share This Page.





# Search Results for WAKE FOREST, TOWN OF

Click [subscribe](#) to receive email notifications when products are updated. If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a [map specialist](#).

**Please Note:** Searching All Products by county displays all products for all communities within the county. You can refine your search results by specifying your specific jurisdiction location using the drop-down menus above.

## Effective Products (43)

- ▶ FIRM Panels (14 ) 
- ▶ FIS Reports (8 ) 
- ▶ LOMC (19)
- ▶ NFHL Data-State (1)
- ▶ NFHL Data-County (1)

## Preliminary Products (247 )

## Pending Product (0)

## Historic Products (30)

## Flood Risk Products (0)

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[DHS.gov](#) [Ready.gov](#) [USA.gov](#) [DisasterAssistance.gov](#)





# Search Results for WAKE FOREST, TOWN OF

Click [subscribe](#) to receive email notifications when products are updated. If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a [map specialist](#).

**Please Note:** Searching All Products by county displays all products for all communities within the county. You can refine your search results by specifying your specific jurisdiction location using the drop-down menus above.

Effective Products (43) ?

FIRM Panels (14) [DL ALL](#)

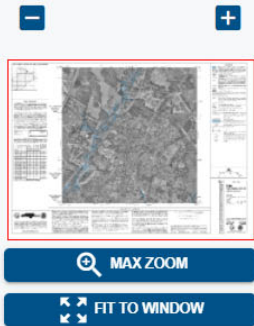
**Please note:** Searches often result in many map files listed under a given section. You can determine the Product ID for the individual map panel needed by looking at the Map Index file. The index map files have "IND" within the Product ID and appear at the start of the list. These index files show an overview of a jurisdiction and how it is subdivided into map panels with the Product ID for each panel shown.

Show 100 entries

Showing 1 to 14 of 14 entries

Product ID	Effective Date	LOMC	Size	Download	View
37183CIND0G	12/06/2019		1MB	<a href="#">DL</a>	<a href="#">VIEW</a>
3720173800J	05/02/2006	<a href="#">LOMC</a>	11MB	<a href="#">DL</a>	<a href="#">VIEW</a>
3720173900J	05/02/2006	<a href="#">LOMC</a>	10MB	<a href="#">DL</a>	<a href="#">VIEW</a>
3720174800J	05/02/2006	<a href="#">LOMC</a>	8MB	<a href="#">DL</a>	<a href="#">VIEW</a>



[illegible]



## Create A FIRMette

CLOSE X

### 1 Select Page Size

- ☒ Letter 8.5X11
- ☐ Legal 8.5X14
- ☐ Tabloid 11X17

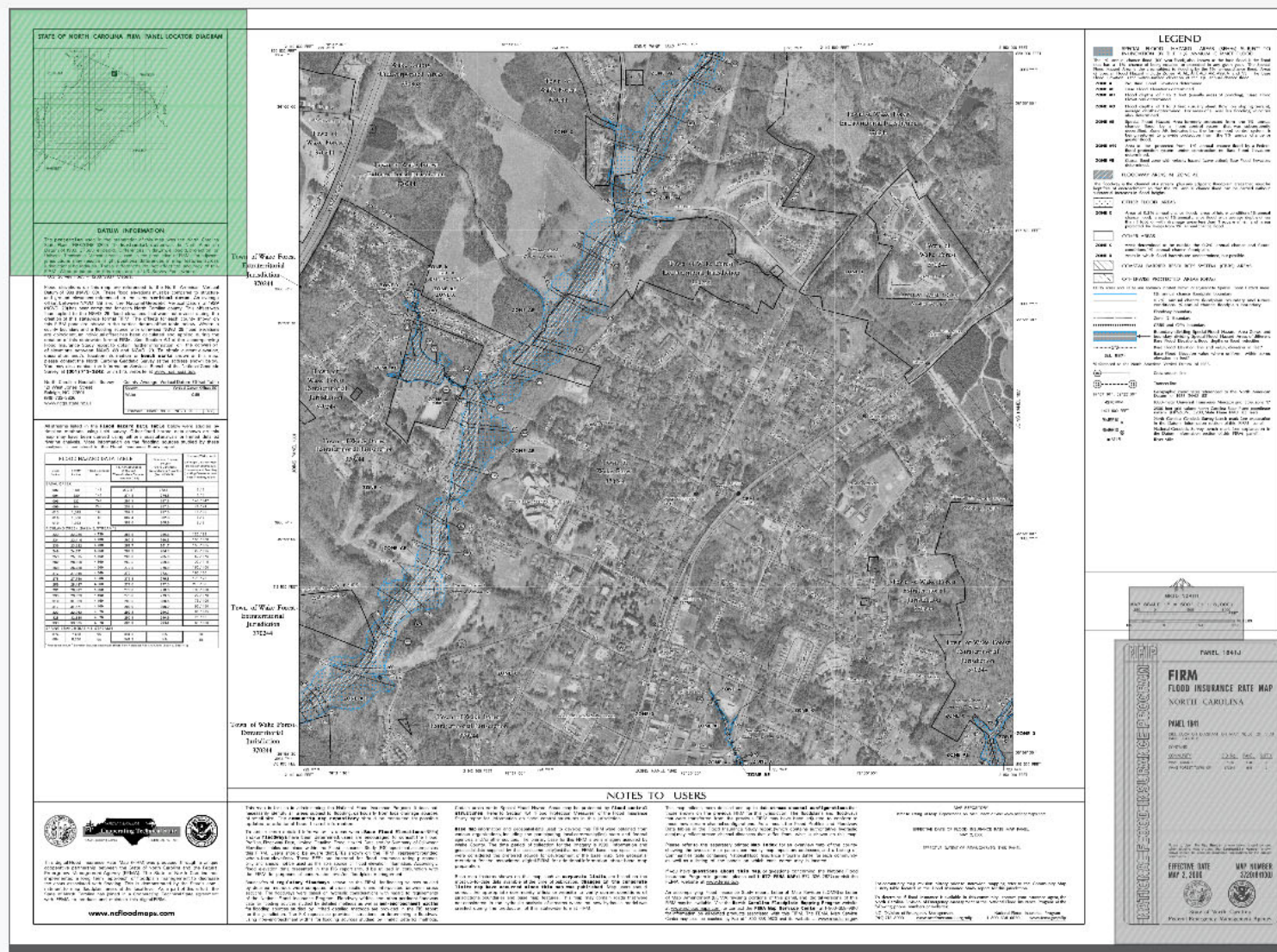
**NEXT**

## 2 Select Print Area

### 3 Scale and North Arrow

#### 4 Title Block

## 5 Preview FIRMette



**North Carolina Emergency Management  
Floodplain Management Section**





FEMA Flood Map Service Center: FIRMeta Web

Create A FIRMeta

CLOSE X

1 Select Page Size

- ☒ Letter 8.5X11
- ☐ Legal 8.5X14
- ☐ Tabloid 11X17

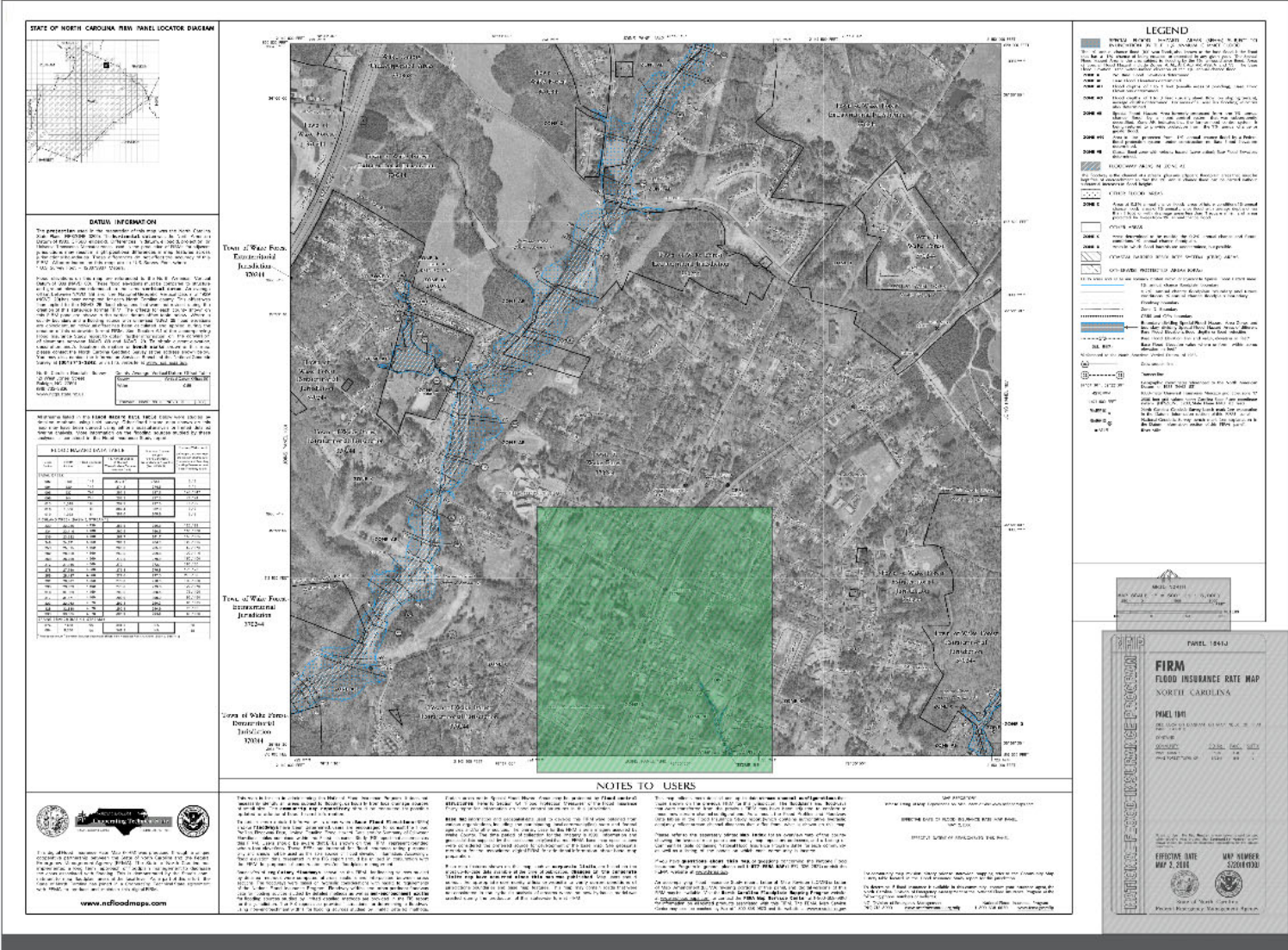
NEXT

2 Select Print Area

3 Scale and North Arrow

4 Title Block

5 Preview FIRMeta



North Carolina Emergency Management  
Floodplain Management Section





FEMA Flood Map Service Center: FIRMeTte Web

## Create A FIRMette

CLOSE X

Select Page Size

Select Print Area

### Scale and North Arrow

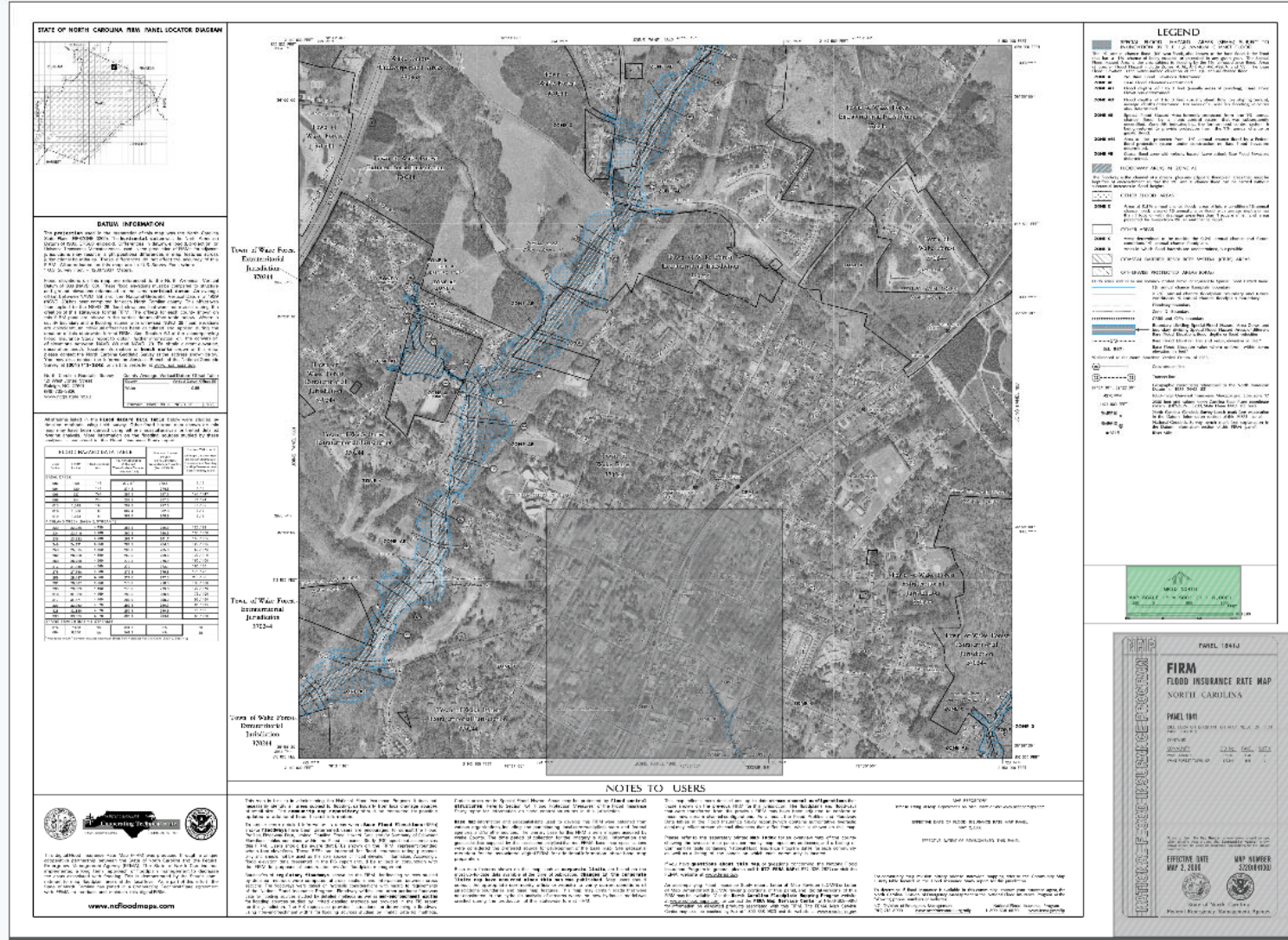
Sometimes the selection box for the north arrow and scale isn't centered over those map elements when the map opens. Click and drag the green box over the north arrow and scale if needed.

[BACK](#)

**NEXT**

## Title Block

## Preview FIRMette



**North Carolina Emergency Management  
Floodplain Management Section**





FEMA Flood Map Service Center: FIRMette Web

## Create A FIRMette

CLOSE X

Select Page Size

Select Print Area

### Scale and North Arrow

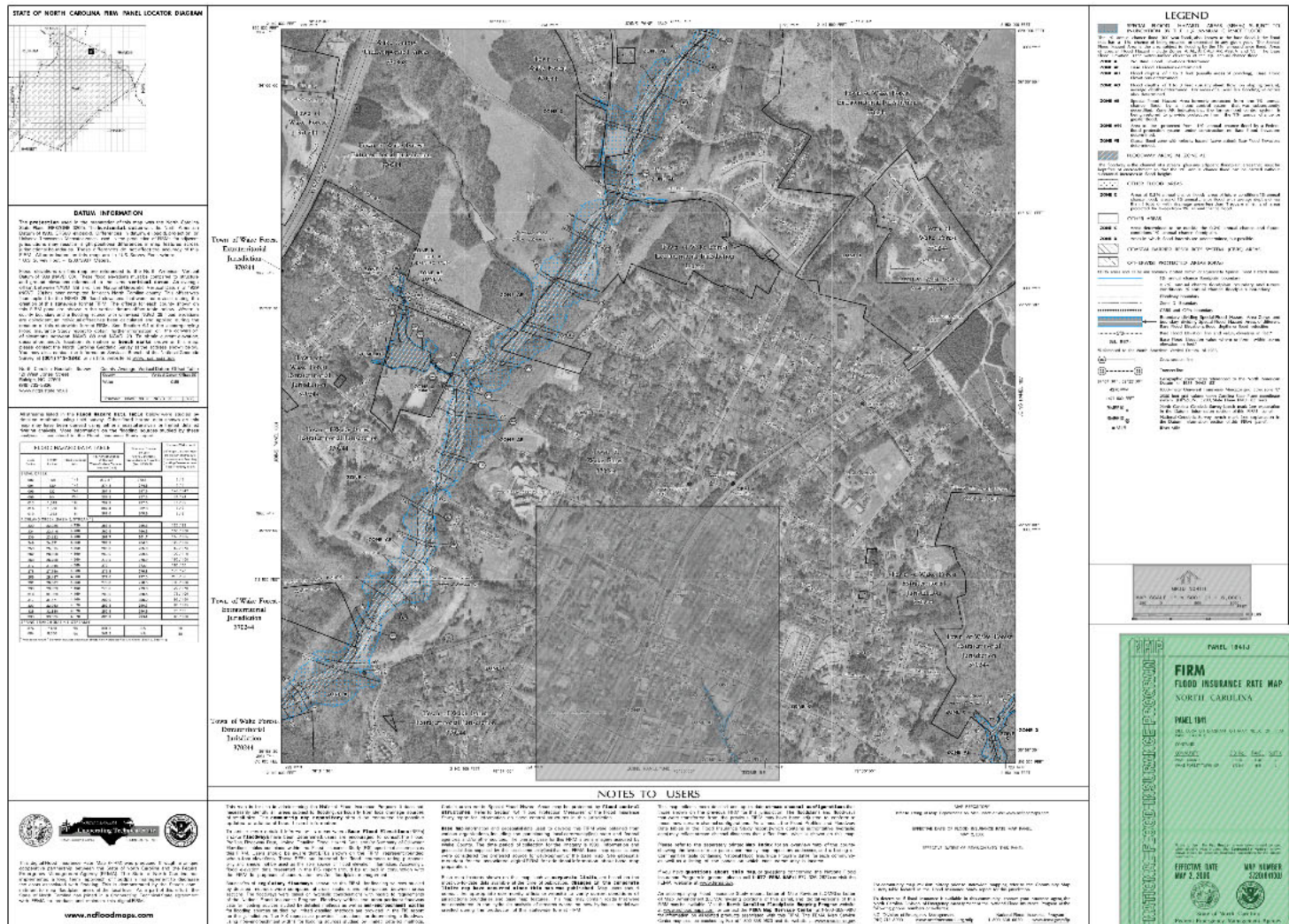
## Title Block

Sometimes the selection box for the title block isn't centered over the title block in the bottom right when the map opens. Click and drag the green box over the title block if needed.

[BACK](#)

**NEXT**

## Preview FIRMette



**North Carolina Emergency Management  
Floodplain Management Section**





FEMA Flood Map Service Center: FIRMette Web

## Create A FIRMette

CLOSE X

Select Page Size

Select Print Area

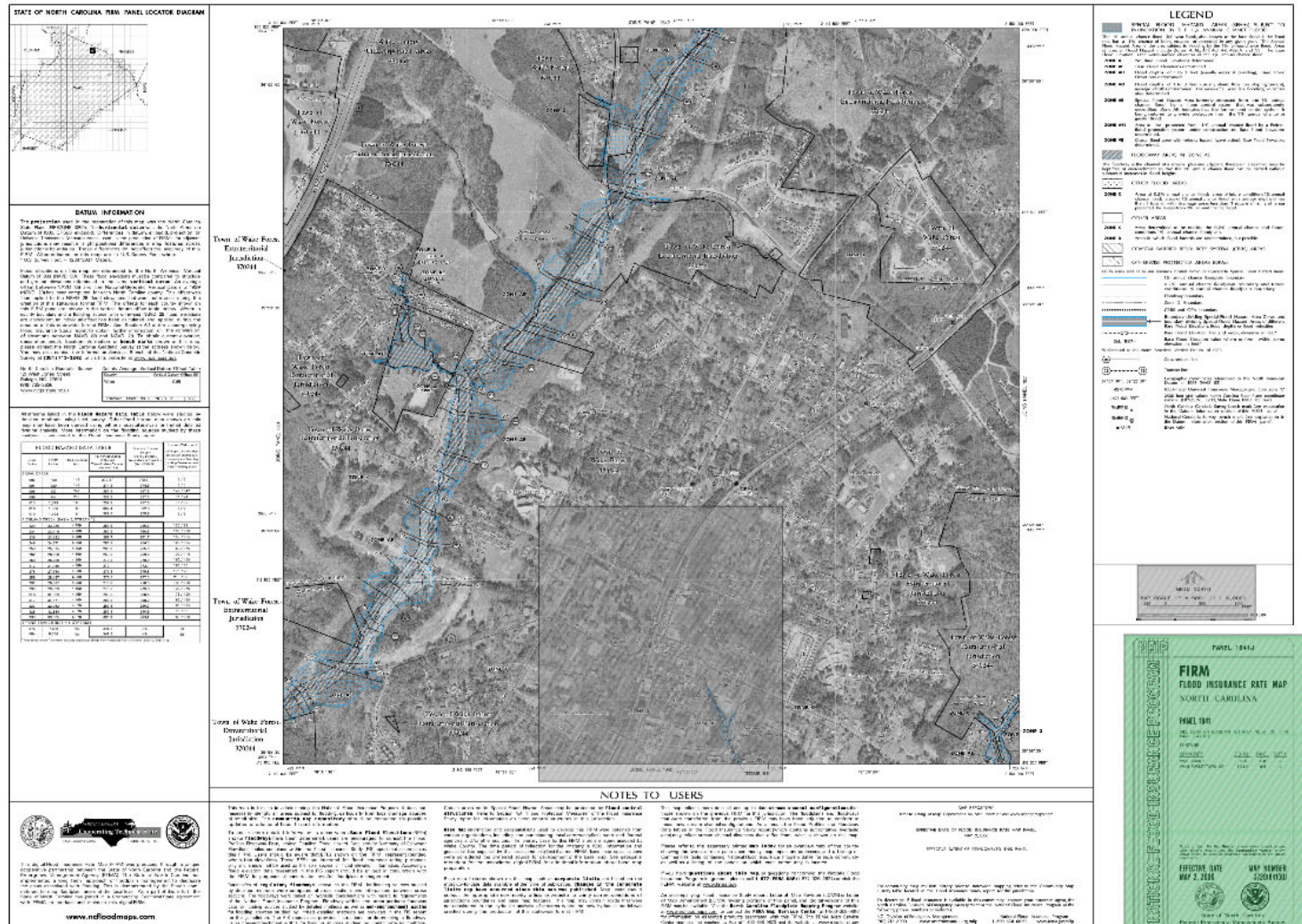
### Scale and North Arrow

## Title Block

## Preview FIRMette

[BACK](#)

## PREVIEW



**North Carolina Emergency Management  
Floodplain Management Section**





## Create A FIRMette

CLOSE X

### Select Page Size

Select Print Area

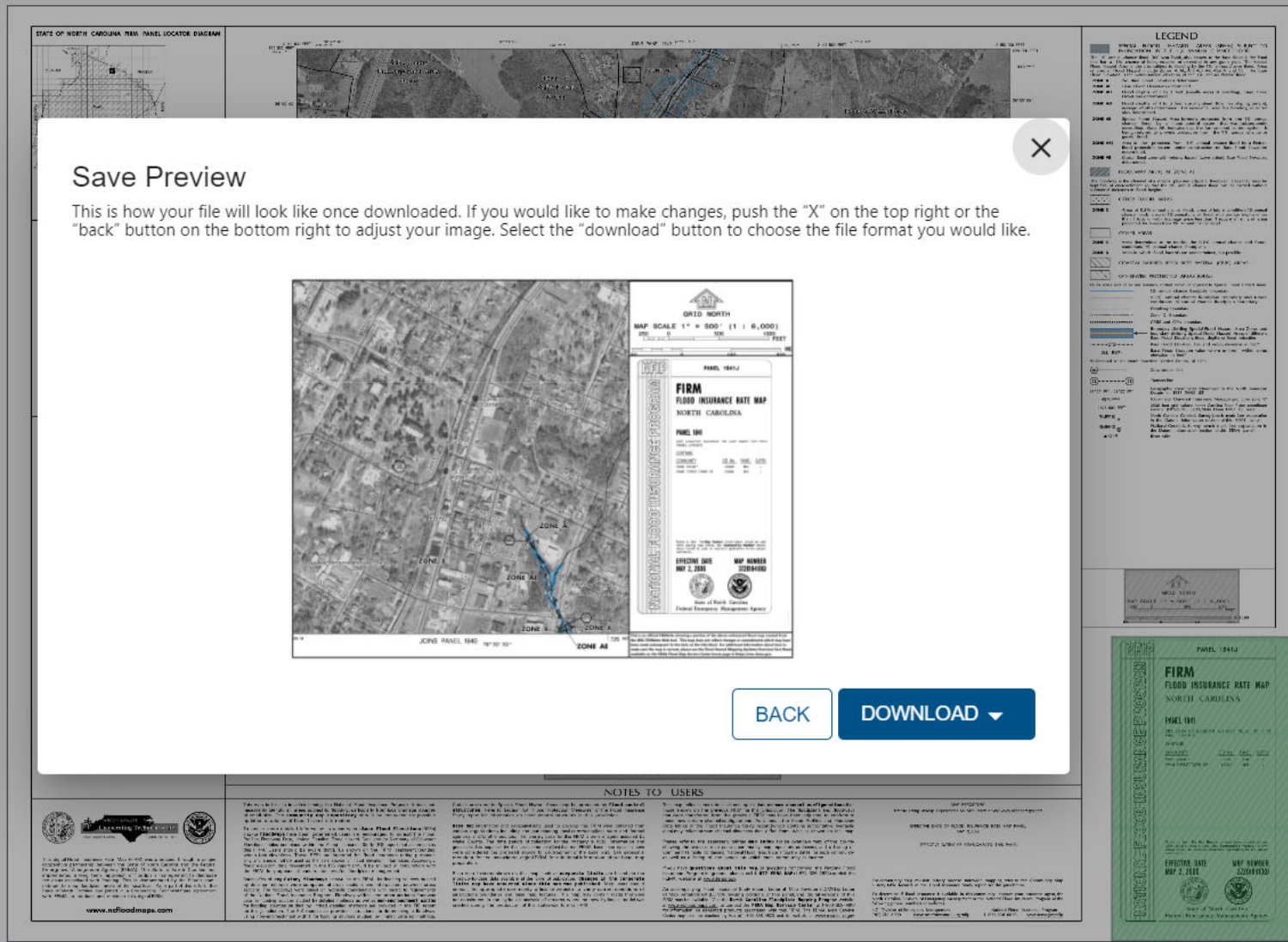
### Scale and North Arrow

### Title Block

## Preview FIRMette

[BACK](#)

## PREVIEW



**North Carolina Emergency Management  
Floodplain Management Section**





FEMA Flood Map Service Center: FIRMette Web

Create A FIRMette

CLOSE X

Select Page Size

Select Print Area

Scale and North Arrow

Title Block

5 Preview FIRMette

BACK PREVIEW

STATE OF NORTH CAROLINA: NEW PANEL LOCATOR DIAGRAM

Save Preview

This is how your file will look like once downloaded. If you would like to make changes, push the "X" on the top right or the "back" button on the bottom right to adjust your image. Select the "download" button to choose the file format you would like.

BACK

DOWNLOAD

PDF

PNG

NOTES TO USERS

1. This map is a reproduction of the original map and is not a substitute for the original map. The original map is the authoritative source for all information contained herein.

2. This map is a reproduction of the original map and is not a substitute for the original map. The original map is the authoritative source for all information contained herein.

3. This map is a reproduction of the original map and is not a substitute for the original map. The original map is the authoritative source for all information contained herein.

4. This map is a reproduction of the original map and is not a substitute for the original map. The original map is the authoritative source for all information contained herein.

5. This map is a reproduction of the original map and is not a substitute for the original map. The original map is the authoritative source for all information contained herein.

North Carolina Emergency Management  
Floodplain Management Section





GRID NORTH

MAP SCALE 1" = 500' (1 : 6,000)

250 0 500 1000 FEET

NFIP

PANEL 1841J

# **FIRM** **FLOOD INSURANCE RATE MAP** **NORTH CAROLINA**

PANEL 1841

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	CID No.	PANEL	SUFFIX
WAKE COUNTY	370368	1841	J
WAKE FOREST, TOWN OF	370244	1841	J

Note to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**EFFECTIVE DATE**  
**MAY 2, 2006**

**MAP NUMBER**  
**3720184100J**



State of North Carolina  
Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at <https://msc.fema.gov>.







# **North Carolina Certified Floodplain Surveyor Refresher**

## **LOMC Processing Updates**

**April 29, 2022**



**North Carolina Emergency Management  
Floodplain Management Section**





# MT-1 Forms and Instructions

- Available on FEMA's website:
  - <https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1>
- MT-1 Instructions have been updated (October 2021)
  - Copy included with Handouts
- MT-1 Forms: Use current version



# What Is a LOMC?

- Document issued by FEMA\* that officially amends or revises the digital FIRM and/or FIS report
  - LOMR
  - LOMR-F
  - LOMA
- Comment Document issued by FEMA based on proposed construction or development within the floodplain, not an official determination:
  - CLOMR
  - CLOMR-F
  - CLOMA

\* Some LOMCs are processed by the NCFMP and Mecklenburg County through pilot LOMC delegation programs



**North Carolina Emergency Management  
Floodplain Management Section**





# LOMA and LOMR-F Determinations

- Removal – Lowest elevation (parcel and/or structure) equal to or above BFE at that location
- Out As Shown (OAS) – Parcel and/or structure is completely shown outside SFHA when plotted on panel
- Non-Removal/Denial – Lowest elevation (parcel and/or structure) below BFE at that location
- Inadvertent Inclusion – Parcel and/or structure is depicted in the floodway, but natural grade elevations prove parcel/structure elevation is equal to or above BFE



# FEMA POLICY Standards for Flood Risk Analysis and Mapping

## FEMA Policy #FP 204-078-1 (Rev 12) – November 2021

- <https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>
- **62, 4/11/2019:** New or updated flood hazard data used for the regulatory products must be supported by modeling and/or sound engineering judgment. All regulatory products must be in agreement.
- **74, 4/11/2019:** The hydrologic, hydraulic, and coastal analyses and the published regulatory products must be certified by a registered professional engineer.
- **176, 11/30/2021:** All spatial data must be georeferenced, have a standard coordinate system documented, and specify the horizontal and vertical datums used. The data documentation should specify the projection, or clarify that data is unprojected.



# FEMA POLICY Standards for Flood Risk Analysis and Mapping

## FEMA Policy #FP 204-078-1 (Rev 12) – November 2021

- <https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>
- **215, 11/30/2019:** Conditional LOMCs are subject to the same standards of a LOMA, LOMR-F, or LOMR except:
  - Because Conditional LOMCs are based on proposed construction, as-built information is not required.
  - The Conditional Comment Documents that are issued by FEMA do not amend or revise the effective FHBM or FIRM.
  - Conditional LOMRs and CLOMR-Fs must demonstrate compliance with the Endangered Species Act.
- **217, 11/30/2019:** If all information is not received within 90 days from the date of the request for additional data, the processing of the LOMC shall be suspended.



# FEMA POLICY Standards for Flood Risk Analysis and Mapping

## FEMA Policy #FP 204-078-1 (Rev 12) – November 2021

- <https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>
- **218, 11/30/2019:** LOMA, CLOMA, LOMR-F, CLOMR-F, LOMR and CLOMR determinations must be issued based on the effective FIRM and FIS for a community and may not be issued based on preliminary data for a FEMA-contracted Flood Risk Project or community-initiated map revision. However, if the effective SFHA does not have BFEs or flood depths established and the preliminary data is the best available, a one-percent-annual chance flood hazard water surface elevation may be calculated during LOMA, CLOMA, LOMR-F, or CLOMR-F reviews using data from these sources.
- **226, 11/30/2019:** LOMC requests involving below-grade crawlspaces constructed within the SFHA shall follow guidance provided in FEMA Technical Bulletin 11 (Crawlspace Construction for Buildings Located in Special Flood Hazard Areas).



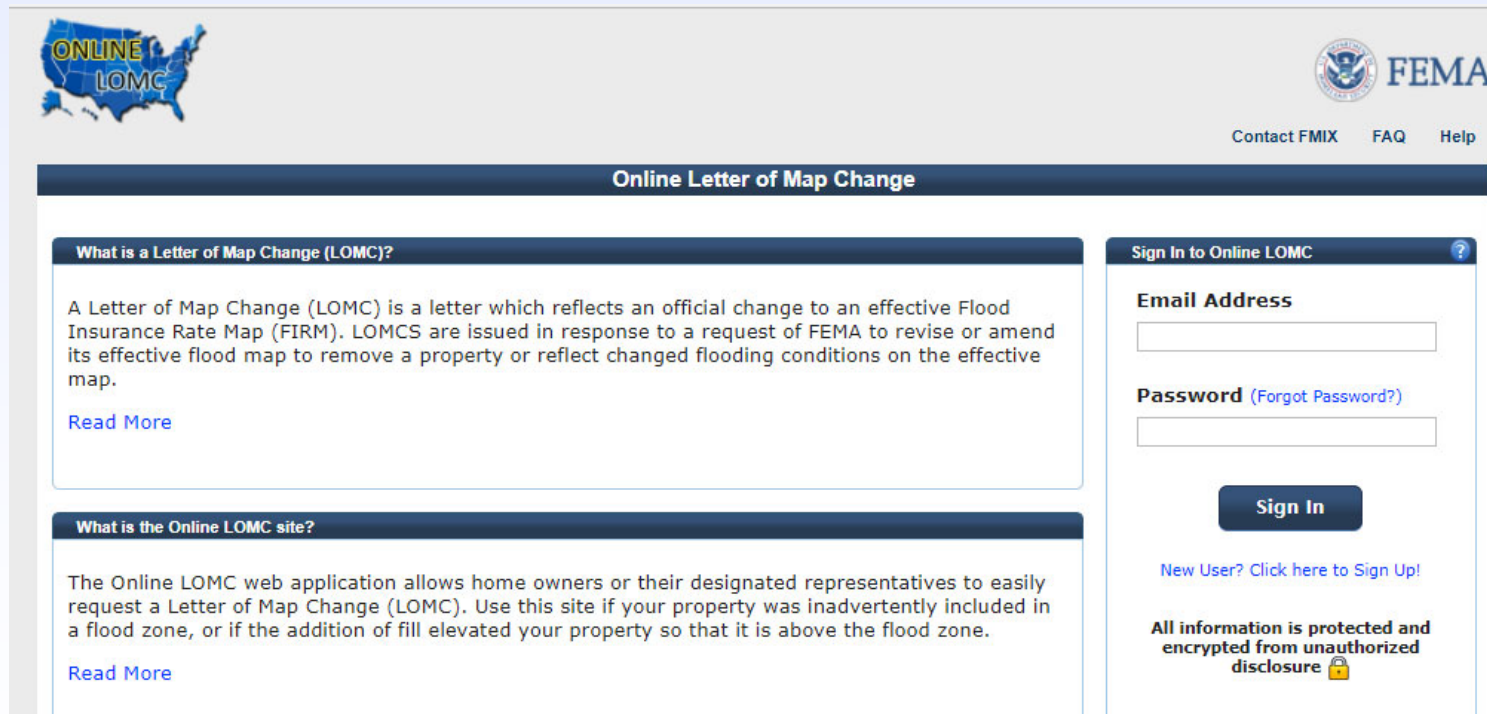
# Submitting Completed CFS Cases

- Case file must be complete
- Determination will not be given over the telephone or via e-mail
- If submittal received is incomplete, CFS will receive letter stating submittal has been removed from fast-track processing and will be processed within the standard 30-60 days



# Submitting Completed Cases

- For best results, submit applications via the Online LOMC portal - **<https://hazards.fema.gov/femaportal/onlinelomc/signin>**



**Online Letter of Map Change**

**What is a Letter of Map Change (LOMC)?**

A Letter of Map Change (LOMC) is a letter which reflects an official change to an effective Flood Insurance Rate Map (FIRM). LOMCS are issued in response to a request of FEMA to revise or amend its effective flood map to remove a property or reflect changed flooding conditions on the effective map.

[Read More](#)

**What is the Online LOMC site?**

The Online LOMC web application allows home owners or their designated representatives to easily request a Letter of Map Change (LOMC). Use this site if your property was inadvertently included in a flood zone, or if the addition of fill elevated your property so that it is above the flood zone.

[Read More](#)

**Sign In to Online LOMC**

**Email Address**

**Password** ([Forgot Password?](#))

**Sign In**

[New User? Click here to Sign Up!](#)

All information is protected and encrypted from unauthorized disclosure



# Submitting Completed Cases

- Send all submittals to the following address:

LOMC Clearinghouse  
Attn: Susan K. Gray, PMP, CFM  
3601 Eisenhower Avenue, Suite 500  
Alexandria, VA 22304-6426

- Failure to mark the submittal “Attn: Susan K. Gray” could result in a delay in processing



# Submitting Completed Cases

- After the package has been mailed, please e-mail:

Susan K. Gray  
CFS Coordinator  
SGray@mbakerintl.com

- Alert Ms. Gray that a CFS LOMC has been sent to the LOMC Clearinghouse or through the Online LOMC portal.



# Types of Cases Eligible for Expedited Review under CFS Process

- Existing single or multiple *structures* constructed on fill or natural ground
- Existing single or multiple *properties*, constructed on fill or natural ground
- *Metes and bounds* area defining portion of property or properties, constructed on fill or natural ground

The BFE must remain constant OR  
lowest property elevation  $\geq$  highest BFE



# Types of Cases Eligible for Expedited Review under CFS Process

## ➤ Located in Zone AE (non-coastal):

- Use BFE from-
  - ◆ Flood Profile or Summary of Stillwater Elevations table [both in Flood Insurance Study (FIS) report]
  - ◆ Interpolated BFE from flood map with Limited Detail Flood Hazard Data Table from FIS report
- Process and submit to FEMA's Production and Technical Services (PTS) Contractor for expedited review and issuance



# Types of Cases Eligible for Expedited Review under CFS Process

## ➤ Located in Zone A:

- Only if BFE is available from non-local government agency or other accepted source (i.e. U.S. Army Corps of Engineers, DOT, or Tennessee Valley Authority)
- If no BFE is available, forward request to FEMA/PTS Contractor for standard LOMC processing and issuance



# Types of Cases Eligible for Expedited Review under CFS Process

## ➤ Located in Zone X:

- If not located in SFHA, structure and/or property is 'out as shown' (OAS)
- Process as OAS and submit to FEMA/PTS Contractor for expedited review and issuance



# Types of Cases Not Eligible for Expedited Review under CFS Process

- Conditional requests
- Cases that follow CLOMAs or CLOMR-Fs
- Cases located in or touching the V Zone, VE Zone, and CBRS
- Cases involving property that touch V Zone, VE Zones, CBRS, where fill, grading, or excavation has occurred
- Areas in coastal AE Zones where the BFE corresponds to transect data rather than Summary of Stillwater Elevations table



# Types of Cases Not Eligible for Expedited Review under CFS Process

- Subject of the case in a floodway
- Potential floodway violations (structure built in a floodway)
- Properties with BFE that changes over length of property where lowest property elevation is not above the highest BFE
- Denials – Submittals of cases previously denied/ issued as non-removal.



# Part 72 Procedures and Fees

- Purpose – To provide administrative and cost-recovery procedures for engineering review and administrative processing associated with FEMA's response to requests for conditional LOMAs, conditional LOMR-Fs, conditional LOMRs, LOMR-Fs, LOMRs, and PMRs



# Section 72.5 – Exemptions

- Requests for map changes based on mapping or analysis errors or effects of natural changes with SFHAs
- Requests for LOMAs
- Map changes based on detailed hydrologic and hydraulic studies replacing approximate studies (Zone A)
- Federally sponsored flood-control projects that are 50% federally funded



# HFIAA – Exemptions

- In accordance with the Homeowner Flood Insurance Affordability Act of 2014 (Public Law 113-89, section 22), a requester shall be exempt from submitting a review or processing fee for a request for a Flood Insurance Rate Map (FIRM) change based on a project where: (1) the primary purpose is habitat restoration; and (2) where the project is funded in whole or in part with Federal or State funds. This exemption includes projects for dam removal, culvert redesign or installation or the installation of fish passage. For the purposes of this exemption, “habitat restoration” will have the same meaning as the term as it appears in the Partners for Fish and Wildlife Act, 16 USC § 3772 (5).



# Current Fee Schedule

Request	Paper Form Fee	Online LOMC Fee
Single-lot, single-structure, multiple-lot, or multiple-structure LOMA	Free	Free
Single-lot or single-structure Conditional LOMA and Conditional LOMR-F (CLOMA & CLOMR-F)	\$600	\$500
Single-lot or single-structure LOMR-F	\$525	\$425
Single-lot or single-structure LOMR-F based on as-built information (CLOMR-F previously issued)	\$425	\$325
Multiple-lot or multiple-structure conditional LOMA	\$800	\$700
Multiple-lot or multiple-structure conditional LOMR-F and LOMR-F (CLOMA & CLOMR-F)	\$900	\$800
Multiple-lot or multiple-structure LOMR-F based on as-built information (CLOMR-F previously issued)	\$800	\$700

Current fee schedule is located at:  
<http://www.fema.gov/flood-map-related-fees>



**North Carolina Emergency Management  
Floodplain Management Section**





# Common Problems with LOMA and LOMR-F Cases



**North Carolina Emergency Management  
Floodplain Management Section**





# Common Problems

- Incorrect or insufficient fee submitted
  - Multi-lot LOMR-F fee will apply when metes and bounds request is submitted for a portion of property where there is evidence that lots will be subdivided
- Forms not submitted or incomplete
  - Community Identification Number (CID) missing
  - Community Acknowledgement Form (MT-1 Form 3) not included for LOMR-F cases
  - Property address not provided
- Certifications not provided on forms, Site Plans, FIRM
- Effective NFIP map not used
- Recorded Deed not included



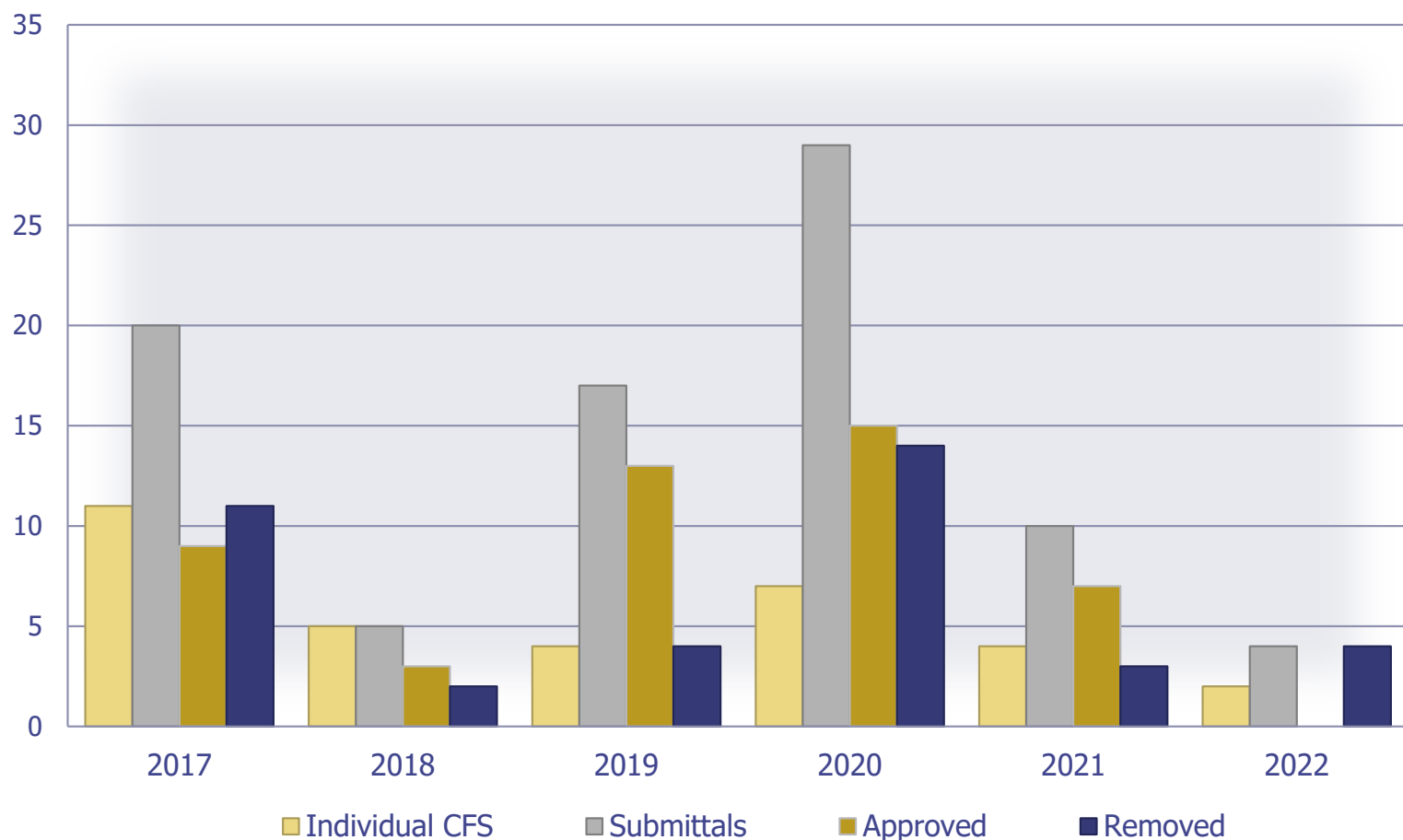
# Common Problems

- Confusion about definitions:
  - Lowest adjacent grade elevation and Lowest lot elevation
- Floor elevation submitted
- Grading complete, but house not as-built (cannot exclude proposed building)
- Recordation data missing from deed or plat map
- Elevations not provided to the tenth of a foot
- BFE methodology not provided
- Plat or tax map insufficient to locate property on FIRM
- Metes and Bounds request without the certified metes and bounds map and description (WORD format)
- Metes and Bounds includes flooding source and/or cuts through existing structures



# CFS Statistics

**NC CFS Statistics 2017 through March 2022**



- 2017
  - 9 of 20 (45%)
- 2018
  - 3 of 5 (60%)
- 2019
  - 13 of 17 (76.5%)
- 2020
  - 15 of 29 (51.7%)
- 2021
  - 7 of 10 (70%)
- 2022 (March)
  - 0 of 4 (0%)



# CFS Support

- FEMA Mapping and Insurance eXchange (FMIX)
  - 1-877-FEMA MAP (1-877-336-2627)
  - FEMA-FMIX@fema.dhs.gov (New Address)
  - Live Chat: <http://msc.fema.gov/portal/resources/contact>
- FEMA – for information not available through FMIX ([www.fema.gov](http://www.fema.gov))
- North Carolina Division of Emergency Management
  - North Carolina Floodplain Mapping Program (<https://flood.nc.gov/ncflood/>)
  - Floodplain Management (<https://flood.nc.gov/ncflood/ncfip.html>)
  - North Carolina Geodetic Survey (<https://ncgs.state.nc.us/>)



# FEMA Resources/Publications

- MT-1 Technical Guidance November 2021
  - Section 4.2 Updated guidance on determining BFE for products generated from 2-D models.
- LOMA and LOMR-F Tutorials
  - <https://www.fema.gov/flood-maps/tutorials/letter-map-amendment>
- Answers to Questions About the National Flood Insurance Program booklet
- NFIP Regulations found at:  
<https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B>



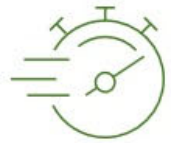
# eLOMA Updates

- Expanded to accept multiple subject requests
- Requests in unnumbered A Zones (with a BFE from an accepted source) now accepted
- After the initial audit, Licensed Professionals (LP) are subject to random audits and the current turnaround time for audits is 2-3 days
- Super User Status
  - Once an eLOMA LP has demonstrated that they have a comprehensive understanding of the eLOMA application process
  - Not subjected to many of the automatic audit triggers that default users are
  - When Super Users are audited the turnaround time for those audits is typically shorter than the standard turnaround time.



# What are the benefits of eLOMA?

## QUICK & EASY



- Receive a determination from FEMA in minutes
- Print a copy almost instantly and save digital copy

## COMPLETELY ONLINE



- Electronic transfer of data, **no mailing required**
- Electronic communication
- Register and renew license info online
- Save an in-progress request and resume later

## ACCEPTS MOST LOMA REQUESTS



- Approximately 75% of all LOMA requests are eligible

## CENTRAL LOCATION



- Track status of all submitted requests in one spot
- Holds data for 3 years
- Easy to organize required data and submit audit requirements

## NO COST



- **NO FEE** to use eLOMA tool or print final determination



**North Carolina Emergency Management  
Floodplain Management Section**







**North Carolina Emergency Management  
Floodplain Management Section**





# **North Carolina Certified Floodplain Surveyor Refresher**

## **Elevation Certificates**

**April 29, 2022**



**North Carolina Emergency Management**





# What is the purpose of the Elevation Certificate?



## ➤ ~~Flood Insurance Policy Rating~~

- Verify Regulatory compliance
- Support of applications for map revisions & amendments
- Required for CRS program

## NOTES:

- Data collected on this form is for the construction & utility service to a single STRUCTURE only.
- Not the lot or other improvements.
- The Community **MUST** maintain their records in perpetuity.



# Who must have an Elevation Certificate?



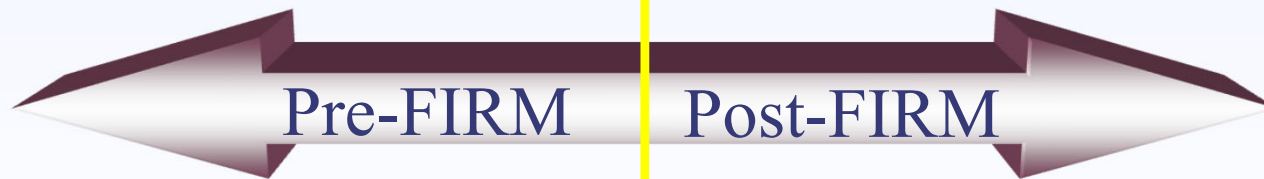
- Anyone who has applied for insurance on a building that is located in a Special Flood Hazard Area (SFHA) ;
- And the construction or substantial improvement of the building started after December 31, 1974 or on or after the date of the initial Flood Insurance Rate Map (FIRM), whichever is later.



# Pre-FIRM vs. Post-FIRM

On or before 12/31/74  
or before the original  
FIRM date

After 12/31/74 and on or  
after the original FIRM date





# Federal Emergency Management Agency Community Status Book Report NORTH CAROLINA

## Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
370165#	ABERDEEN, TOWN OF	MOORE COUNTY	11/30/73	05/15/86	01/02/08	05/15/86	No
370131#	AHOSKIE, TOWN OF	HERTFORD COUNTY	02/22/74	05/01/87	08/03/09(M)	05/01/87	No
370001#	ALAMANCE COUNTY*	ALAMANCE COUNTY	01/03/75	12/01/81	01/02/08	12/01/81	No
370457#	ALAMANCE, VILLAGE OF	ALAMANCE COUNTY	01/03/75	08/15/90	01/02/08	12/17/87	No
370223#	ALBEMARLE, CITY OF	STANLY COUNTY	12/21/73	12/01/81	06/16/09	12/01/81	No
370398#	ALEXANDER COUNTY*	ALEXANDER COUNTY	06/09/78	02/01/91	07/07/09	02/01/91	No
370004#	ALLEGHANY COUNTY*	ALLEGHANY COUNTY	07/01/77	02/01/04	11/04/09	02/01/04	No
370404#	ALLIANCE, TOWN OF	PAMLICO COUNTY	07/14/78	08/05/85	07/02/04	08/05/85	No
370060#	ANDREWS, TOWN OF	CHEROKEE COUNTY	03/08/74	02/01/85	04/19/10	02/01/85	No
370522#	ANGIER, TOWN OF	HARNETT COUNTY		04/16/90	07/17/07	02/03/00	No
370284#	ANSON COUNTY *	ANSON COUNTY	07/15/77	06/18/90	10/16/08	06/18/90	No
370467#	APEX, TOWN OF	WAKE COUNTY		03/03/92	04/16/07	03/20/92	No
370273#	ARCHDALE, CITY OF	GUILFORD COUNTY/RANDOLPH COUNTY	03/01/74	07/16/81	03/16/09	07/16/81	No
370462#	ARCHER LODGE, TOWN OF	JOHNSTON COUNTY		12/02/05	12/02/05	05/06/14	No
370007#	ASHE COUNTY *	ASHE COUNTY	01/03/75	08/16/88	12/03/09	08/16/88	No

<http://www.fema.gov/cis/NC.pdf>



**North Carolina Emergency Management**





# CRS Status Included

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal	CRS Entry Date	Curr Eff Date	Curr Class	% Disc SFHA	% Disc Non SFHA
370491	BOGUE, TOWN OF	CARTERET COUNTY	02/14/75	05/15/80	11/03/05	05/05/97	No					
370453	BOILING SPRING LAKES, CITY OF	BRUNSWICK COUNTY		03/02/89	08/28/18	03/02/89	No					
370550	BOILING SPRINGS, TOWN OF	CLEVELAND COUNTY		02/20/08	07/02/08	03/21/13	No					
370394	BOLIVIA, TOWN OF	BRUNSWICK COUNTY	06/10/77	06/02/06	10/16/08	06/02/06	No					
370274	BOLTON, TOWN OF	COLUMBUS COUNTY	03/08/74	07/01/87	02/16/07	07/01/87	No					
370253	BOONE, TOWN OF	WATAUGA COUNTY	06/21/74	09/28/79	12/03/09	09/28/79	No	10/01/91	10/01/00	7	15%	05%
370354	BOSTIC, TOWN OF	RUTHERFORD COUNTY		07/02/08	01/06/10	09/25/09	No					
370231	BREVARD, CITY OF	TRANSYLVANIA COUNTY	06/14/74	09/29/78	04/19/10	09/29/78	No	10/01/92	10/01/07	8	10%	05%
370436	BRIDGETON, TOWN OF	CRAVEN COUNTY	02/08/74	05/04/87	06/19/20	05/04/87	No					
370552	BROADWAY, TOWN OF	LEE COUNTY/HARNETT COUNTY		09/06/06	(NSFHA)	03/13/09	No					

CRS Entry Date	Curr Eff Date	Curr Class	% Disc SFHA	% Disc Non SFHA
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10/01/91	10/01/00	7	15%	05%
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10/01/92	10/01/07	8	10%	05%
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05/01/18	05/01/18	8	10%	05%
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# Participating Communities

## Summary:

Total In Flood Program	594
Total In Emergency Program	0
Total In the Regular Program	594
Total In Regular Program with No Special Flood Hazard	27
Total In Regular Program But Minimally Flood Prone	13



**North Carolina Emergency Management**





# Non-Participating Communities

## Summary:



Total Not in Flood Program	27
Total Suspended from Emergency Program	1
Total Suspended from Regular Program	1
Total Withdrawn Communities Not In Program	0
Total Not In Program With Hazard Area Identified	27
Total Not In Program With Hazard Area Identified < 1 Year	0



# Support map amendments & revisions

The Elevation Certificate is used to revise a FEMA flood map by:

- Letter of Map Amendment (LOMA)
  - ◆ Changes the flood zone of a specific property.
- Letter of Map Revision (LOMR-F)
  - ◆ Changes the flood zone of a specific property where fill has been placed on the site.

Page 1 of 3		Date: June 03, 2015		Case No.: 15-04-4994A		LOMR-F		
 <b>Federal Emergency Management Agency</b> Washington, D.C. 20472								
<b>LETTER OF MAP REVISION BASED ON FILL DETERMINATION DOCUMENT (REMOVAL)</b>								
<b>COMMUNITY AND MAP PANEL INFORMATION</b>				<b>LEGAL PROPERTY DESCRIPTION</b>				
COMMUNITY		TOWN OF CLAYTON, JOHNSTON COUNTY, NORTH CAROLINA		Lots 6148, 6149 and 6150, Riverwood Athletic Club Alpine Valley, Phase 6E2, as shown on the Plat recorded in Plat Book 73, Page 131, in the Office of the Register of Deeds, Johnston County, North Carolina  The portions of property are more particularly described by the following metes and bounds:				
		COMMUNITY NO.: 370139						
		AFFECTED MAP PANEL						
		NUMBER: 3720176000J						
		DATE: 12/2/2005						
FLOODING SOURCE: MARKS CREEK; NEUSE RIVER				APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 35.636, -78.436 SOURCE OF LAT & LONG: GOOGLE EARTH PRO DATUM: NAD 83				
<b>DETERMINATION</b>								
LOT	BLOCK/SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
6148	--	Riverwood Athletic Club AV, Phase 6E2	433 Swanns Trail	Portion of Property	X (unshaded)	--	--	160.0 feet
<b>Special Flood Hazard Area (SFHA)</b> - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).								
ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)								
LEGAL PROPERTY DESCRIPTION				PORTIONS REMAIN IN THE SFHA				
DETERMINATION TABLE (CONTINUED)				STUDY UNDERWAY				
FILL RECOMMENDATION								
This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Revision based on Fill for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the described portion(s) of the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This document revises the effective NFIP map to remove the subject property from the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.								
This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 647 South Pickett Street, Alexandria, VA 22304-6005.								
 Luis Rodriguez, P.E., Chief Engineering Management Branch Federal Insurance and Mitigation Administration								





# Federal Emergency Management Agency

Washington, D.C. 20472

## LETTER OF MAP AMENDMENT DETERMINATION DOCUMENT (OUT AS SHOWN)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF LUMBERTON, ROBESON COUNTY, NORTH CAROLINA	Lot 13, Section II-B, Cliffridge Subdivision, as described in the North Carolina General Warranty Deed, recorded in Book 1114, Pages 0031 and 0032, in the Office of the Register of Deeds, Robeson County, North Carolina
	COMMUNITY NO.: 370203	
AFFECTED MAP PANEL	NUMBER: 3720030200J	
	DATE: 1/19/2005	

FLOODING SOURCE: MEADOW BRANCH; POLE CAT BRANCH

APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 34.642, -78.993

SOURCE OF LAT & LONG: GOOGLE EARTH PRO

DATUM: NAD 83

### DETERMINATION

LOT	BLOCK/SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS OUTSIDE OF THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
13	-II-B	Cliffridge	1007 Furman Drive	Structure	X (unshaded)	--	--	--

**Special Flood Hazard Area (SFHA)** - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

**ADDITIONAL CONSIDERATIONS** (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

PORTIONS REMAIN IN THE SFHA  
STUDY UNDERWAY

This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Amendment for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the structure(s) on the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). The subject property is correctly shown outside the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. If the policy has been written using an incorrect zone, it can be endorsed to correct the zone for the current policy year and one prior policy term. Please contact the insurance agent or company involved to request endorsement of the policy. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605.

Luis Rodriguez, P.E., Chief  
Engineering Management Branch  
Federal Insurance and Mitigation Administration





# Community Rating System & Elevation Certificates

The NFIP recognizes community efforts that go beyond the minimum floodplain management requirements of the NFIP through the CRS by reducing insurance premiums for the community's property owners

- Community Rating System (CRS) communities are required to obtain and maintain Elevation Certificates.
- This requirement applies to all new construction and substantial improvements to existing structures located in SFHAs.





# Community's EC Review

Community Officials MUST REVIEW Elevation Certificates before accepting them to ensure:

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

If questions arise, please discuss with the professional for clarification or correction.

Structure will be in violation until proper Finished Construction Elevation Certificate is provided.





# Elevation Certificate Sections

**Section A** – Property Info

**Section B** – FIRM Info

**Section C** – Building Elevation (if BFE determined)

**Section D** – Survey Certification

**Section E** – Building Elevation (no BFE)

**Section F** – Property Owner Certification

**Section G** – Community Info



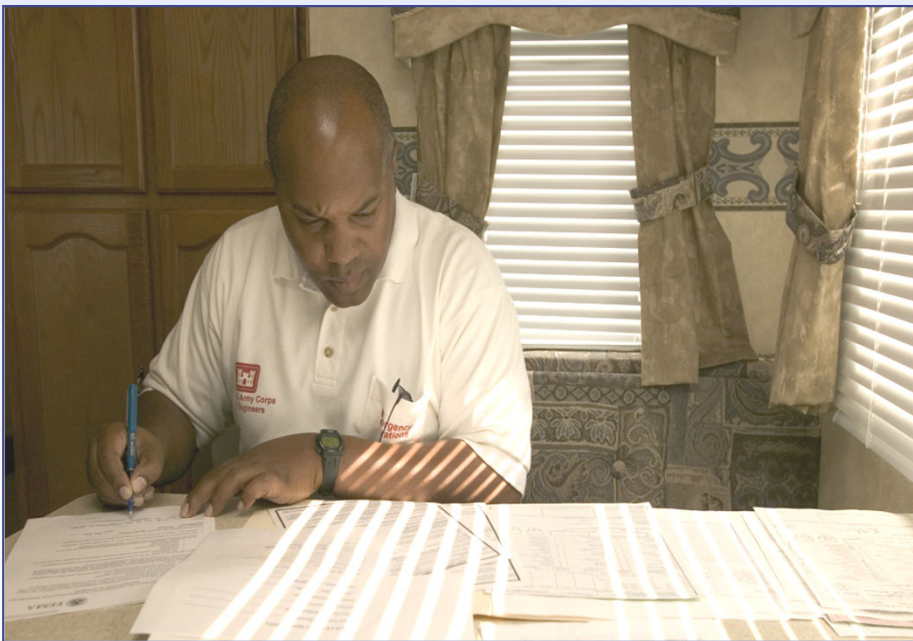


# Who certifies building elevations?

**Surveyor**

*Engineer*

*Architect*



In order to be rated properly, the insured needs a professional like you to certify the building elevation information.



# EC Form Instructions

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

OMB No. 1660-0008  
Expiration Date: November 30, 2022

## Instructions for Completing the Elevation Certificate

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.



**North Carolina Emergency Management**





# Sections A1 – A3

SECTION A – PROPERTY INFORMATION		FOR INSURANCE COMPANY USE
A1. Building Owner's Name <input type="text"/>		Policy Number: <input type="text"/>
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. <input type="text"/>		Company NAIC Number: <input type="text"/>
City <input type="text"/>	State <input type="text"/>	ZIP Code <input type="text"/>
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) <input type="text"/>		

**OR**

- Complete **all** items, except “For Insurance Company Use”.
- A1. Building Owner’s(s’) Name(s)
- A2. **Building Address** - 911 address of building location.
- OR
- A3. The address is a rural route, enter the lot & block numbers, the tax parcel number, the legal description.



**North Carolina Emergency Management**





# Section A4 – A6

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)

A5. Latitude/Longitude: Lat.  Long.  Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number

- A4. Building Use - residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure.
- A5: Latitude / Longitude taken at the front of the building
  - Accurate to 66'
  - NAD 1983
- A6: Photos showing at least front and rear of building
  - Split level requires side photos
  - Detail photos of vents

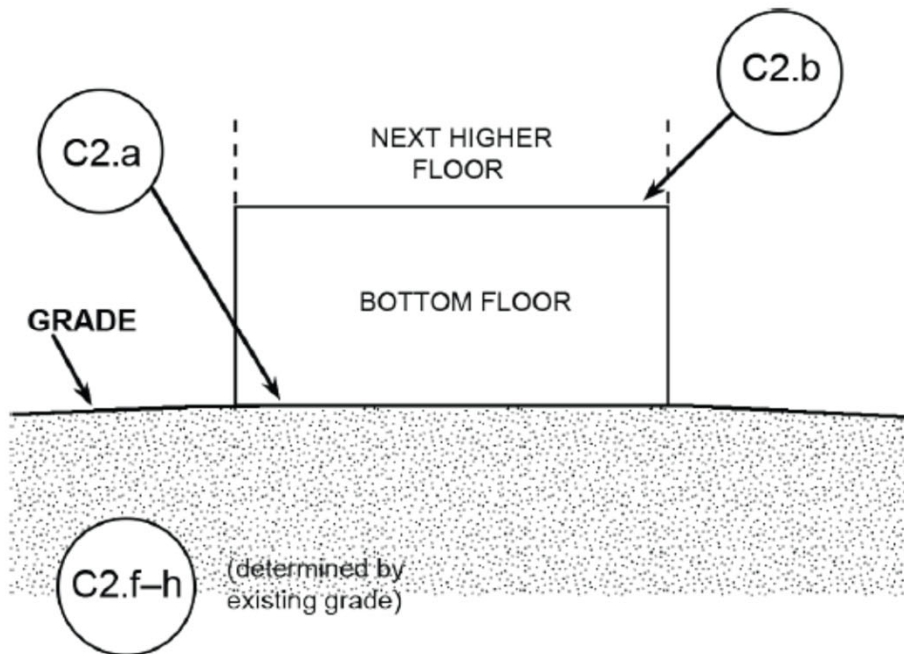


# Section A7

**DIAGRAM 1A**

All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.

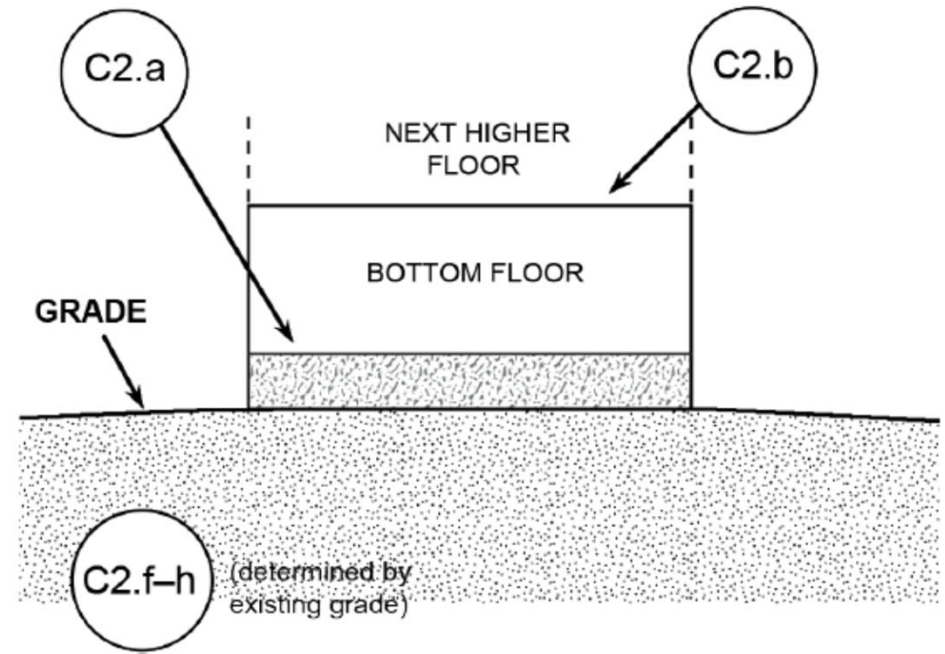
**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.\*



**DIAGRAM 1B**

All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split-level), either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.\*



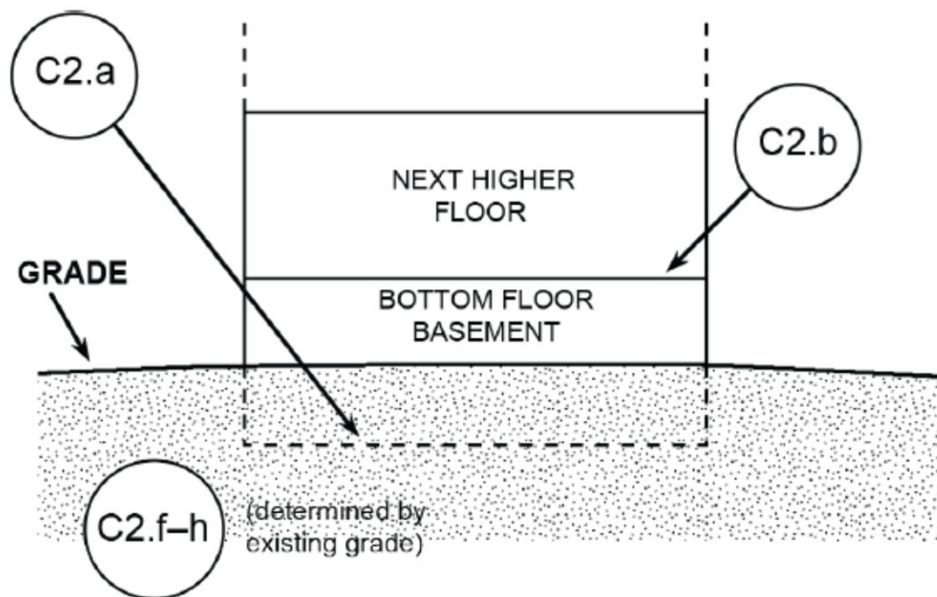


# Section A7

**DIAGRAM 2A**

All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

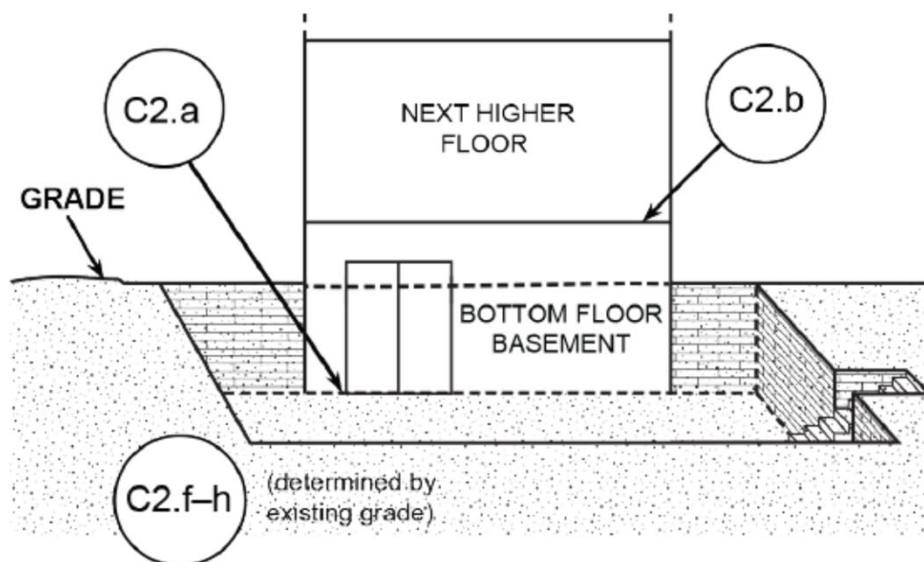
**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.\*



**DIAGRAM 2B**

All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides; most of the height of the walls is below ground level on all sides; and the door and area of egress are also below ground level on all sides.\*



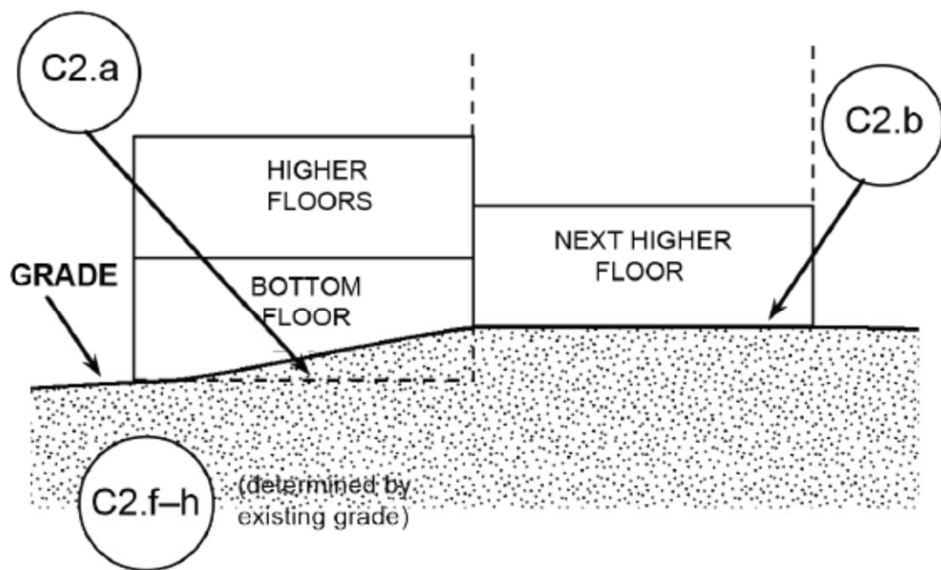


# Section A7

**DIAGRAM 3**

All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.

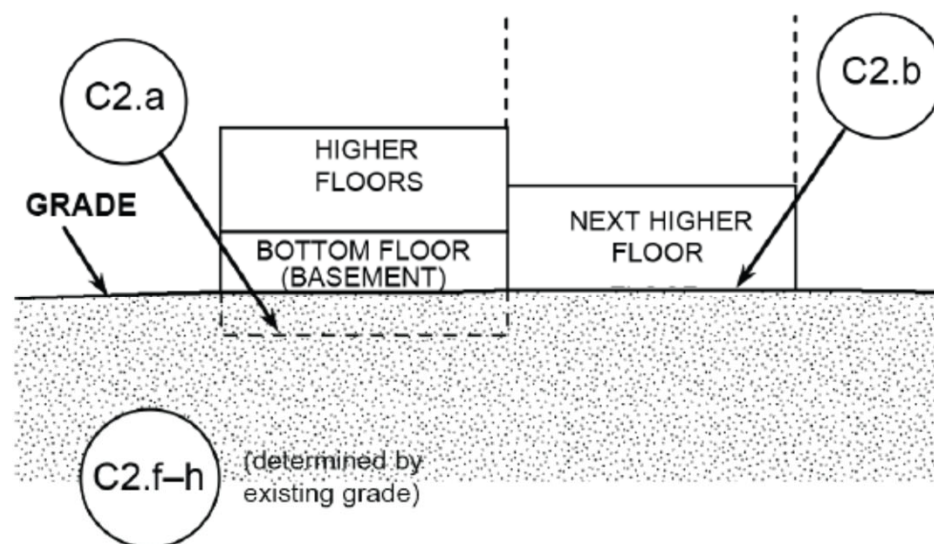
**Distinguishing Feature** – The bottom floor (excluding garage) is at or above ground level (grade) on at least 1 side.\*



**DIAGRAM 4**

All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.\*



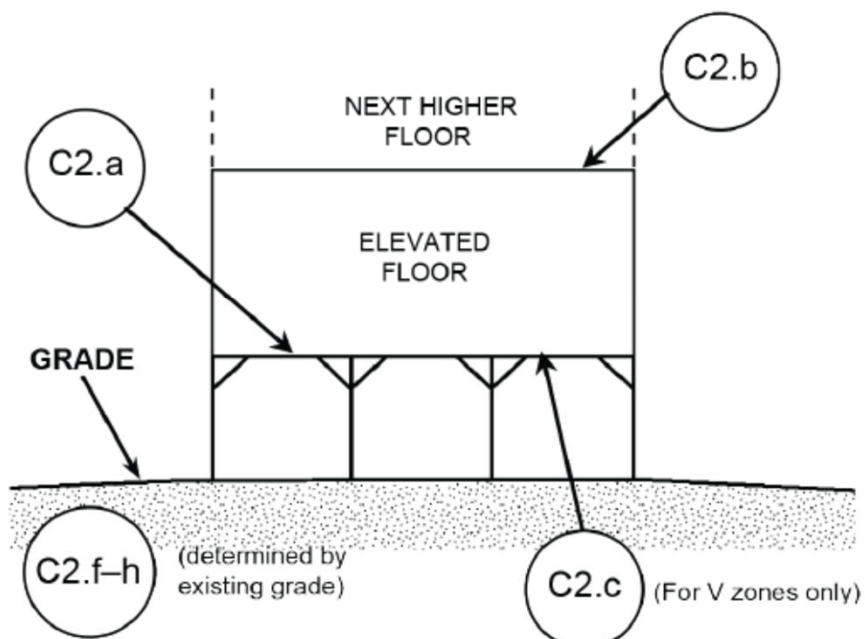


# Section A7

**DIAGRAM 5**

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

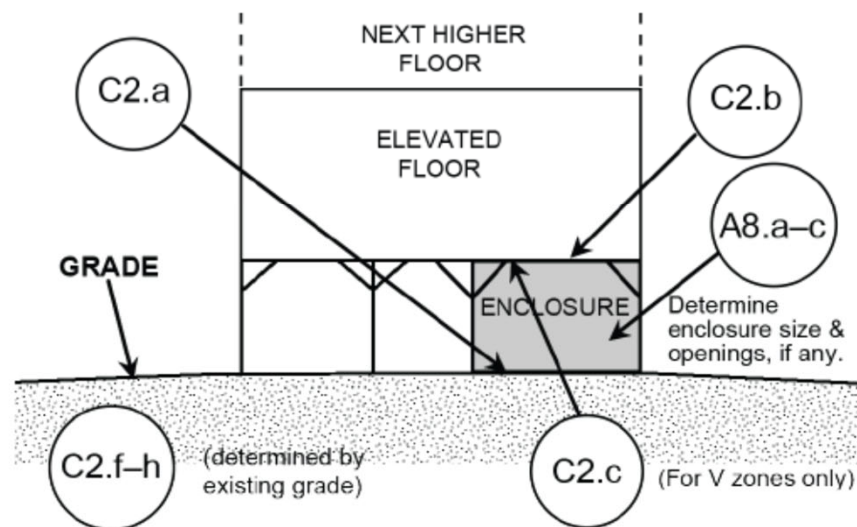
**Distinguishing Feature** – For all zones, the area below the elevated floor is open, with no obstruction to flow of floodwaters (open lattice work and/or insect screening is permissible).



**DIAGRAM 6**

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



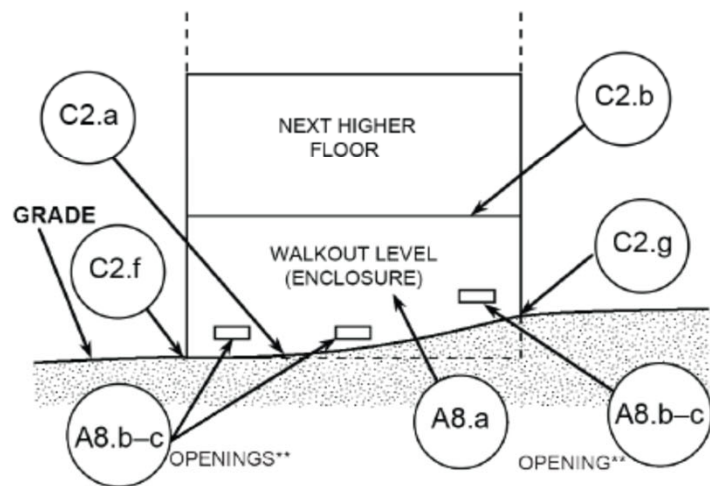


# Section A7

**DIAGRAM 7**

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least 1 side is at or above grade. The principal use of this building is located in the elevated floors of the building.

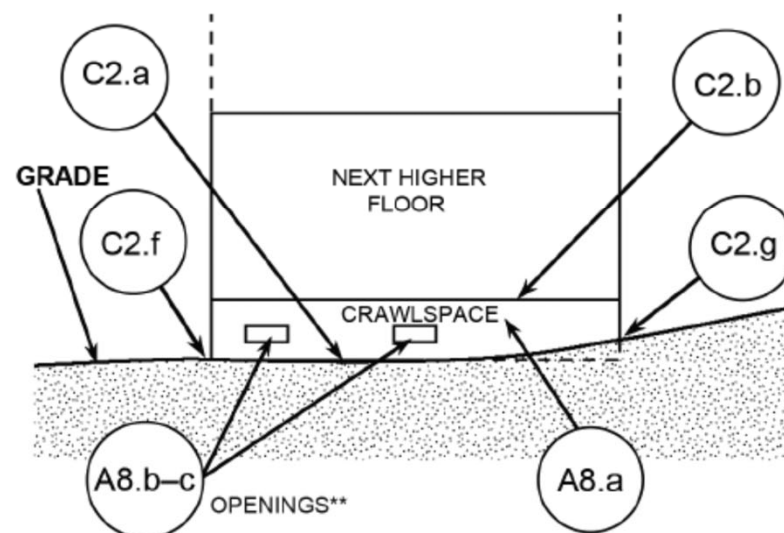
**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



**DIAGRAM 8**

All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least 1 side, with or without an attached garage.

**Distinguishing Feature** – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings\*\* present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.



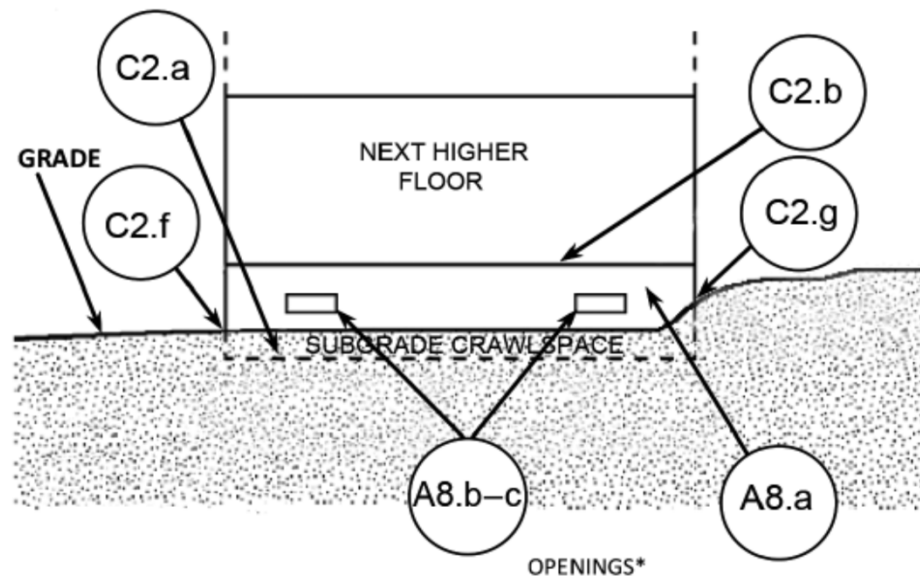


# Section A7

**DIAGRAM 9**

All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.

**Distinguishing Feature** – The bottom (crawlspace) floor is below ground level (grade) on all sides.\* (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, or the crawlspace floor is more than 2 feet below the grade [LAG] on all sides, use Diagram 2A or 2B.)





# Section A8 – A9

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

A9. For a building with an attached garage:

- a) Square footage of attached garage  sq ft
- b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade
- c) Total net area of flood openings in A9.b  sq in
- d) Engineered flood openings? ☐ Yes ☐ No

- In Zones A & AE, fully enclosed areas below the lowest floor shall be designed to automatically equalize hydrostatic flood forces on walls by allowing for the entry & exit of floodwaters
- To meet this requirement, the openings must be:
  - certified by a registered engineer or architect, **OR**
  - meet or exceed the minimum opening requirements



# Section A8c

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

A8.c. Calculate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings.

If the net area cannot be calculated, provide the size of the flood openings without consideration of any covers & indicate in the Comments area the type of cover that exists in the flood openings.



# Section A8d

d) Engineered flood openings? ☐ Yes ☐ No

- A8.d. Engineered flood openings. Attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it.

If the crawlspace or enclosure(s) have no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

FEMA Technical Bulletin 1: "Openings in Foundation Walls and Walls of Enclosures"



# Standards for Elevation on Perimeter Wall Foundations

- In Zones A & AE, fully enclosed areas below the lowest floor shall be designed to automatically equalize hydrostatic flood forces on walls by allowing for the entry & exit of floodwaters
- To meet this requirement, the openings must be:
  - certified by a registered engineer or architect,  
**OR**
  - meet or exceed the minimum opening requirements



# Hydrostatic 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.



# 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.



# FEMA Elevation Certificate

**Items A8.b–d.** Enter in Item A8.b the number of permanent flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. Indicate in Item A8.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the crawlspace or enclosure(s) have no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter "N/A" for not applicable in Items A8.b–c.



**North Carolina Emergency Management**





**R322.2.2 Enclosed area below design flood elevation.** Enclosed areas, including crawl spaces, that are below the design flood elevation shall:

1. Be used solely for parking of vehicles, building access or storage.
2. Be provided with flood openings that meet the following criteria:
  - 2.1. There shall be a minimum of two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings on exterior walls.
  - 2.2. The total net area of all openings shall be at least 1 square inch (645 mm<sup>2</sup>) for each square foot (0.093 m<sup>2</sup>) of enclosed area, **or** the openings shall be designed and the construction documents shall include a statement by a registered design professional that the design of the openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.6.2.2 of ASCE 24.
  - 2.3. The bottom of each opening shall be 1 foot (305 mm) or less above the adjacent ground level.
  - 2.4. Openings shall be not less than 3 inches (76 mm) in any direction in the plane of the wall.
  - 2.5. Any louvers, screens or other opening covers shall allow the automatic flow of floodwaters into and out of the enclosed area.
  - 2.6. Openings installed in doors and windows, that meet requirements 2.1 through 2.5, are acceptable; however, doors and windows without installed openings do not meet the requirements of this section.



Net area?







1 foot?





This looks like 1 foot  
or less.



This looks like 1 foot  
or less.







*This is compliant*





***Plexiglas cover. This is a violation!!***





***Spray foam insulation. This is a violation!!***





















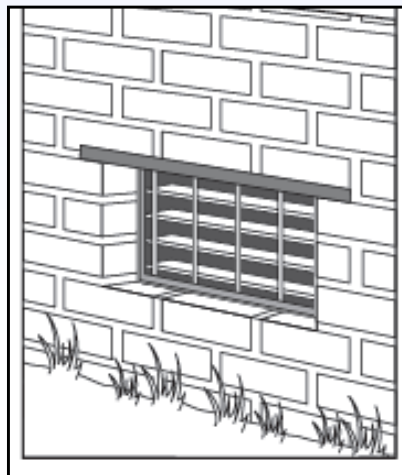
## Openings in Foundation Walls and Walls of Enclosures

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

Technical Bulletin 1 / August 2008



FEMA





# Engineered Openings/Vents

## Plastic – No Rust or Rot Crawspace 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.



Plastic Crawspace Doors & Vents  
Plastic Crawspace Louvers/Screens  
Plastic FEMA Flood Vents

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



Model	Opening Size (HxW)	Non-Engineered (Sq. In.)	Engineered (Sq. In.)	Net-Free Air (Sq. In.)
D1616	16" x 16"	255	200	485
D1624	16" x 24"	380	285	695
D1632	16" x 32"	510	385	935
D2032	20" x 32"		505	1,225
D2424	24" x 24"		435	1,065
D2436	24" x 36"		665	1,620

### Installation Instructions

Each individual opening, and any louvers, screens, or other covers, shall be designed to allow the automatic entry and exit of floodwaters during design flood or lesser flood conditions; there shall be a minimum of two different sides of each opening. If the structure has more than one enclosed area below the DFE, each area shall have openings; openings shall not be less than 3 in. above the finished floor level. The bottom of each required opening shall be no more than 1 ft above the adjacent ground level; the difference between the exterior floodwater level and the bottom of the opening 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: *[Signature]*  
Title: **PRESIDENT, MOOSE ENGINEERING P.C.**  
Type of License: **PROFESSIONAL ENGINEER**  
License Number: **24740**



## SMART VENT



### Flood Openings (TB 1 – August 2008)

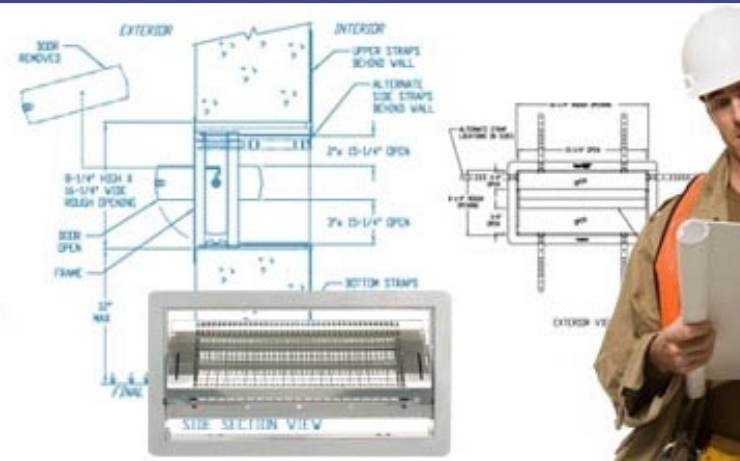
DOOR LOUVER, Patent No. US D583,042, dated December 16, 2008 and owned by and sized in accordance with Federal Emergency Management Agency's National Flood Insurance Program, Technical Bulletin (TB) 1-August 2008 will allow access on exterior walls by allowing for entry and exit of floodwater during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

Engineered, Net-Free Air and Engineered Opening size for each model and size of the opening is listed in the table below. The Engineered size opening calculation was performed in accordance with ASCE/SEI 24-05, Flood Resistance Design and Construction. I measured the openings in Foundation Walls for Buildings Located in Special Flood Hazard Areas in order to determine the Non-Engineered and Net-Free Air opening size for each model. In August 2008 to determine the Engineered opening size for each model. I used the required (in<sup>2</sup>); 0.033 = coefficient corresponding to a factor of safety of 5.0 (in<sup>2</sup> + 2 \* rectangular, long axis horizontal, short axis vertical unobstructed during design between the louvers); R = 5 ft/hr worst case rate of rise and fall; and A<sub>E</sub> = 1 ft<sup>2</sup>

$$0.033 [1/0.40] 5 = .4125 \text{ in}^2$$

$$D0816 = 95 / .4125 = 230$$

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



Smart VENT  
877- 441- 8368  
www.smartvent.com

### DETAIL DIAGRAM MODEL 1540-520 FLOOD VENT INSULATED

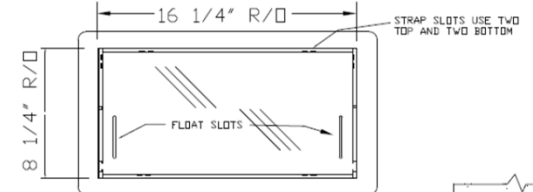


FIGURE 1  
Front View

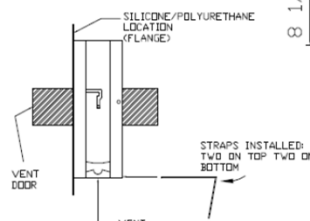


FIGURE 2  
Side View

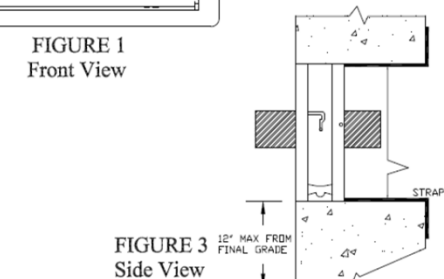
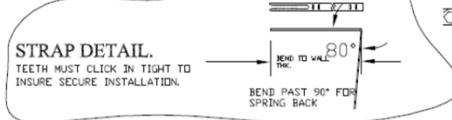


FIGURE 3  
Side View



TOLERANCES UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES XXX 1/16" 1/32" 1/64"		SMART VENT Foundation Flood Vents 450 Andros Dr., Suite 2B Pittman, NJ 08073	
FLOOD VENT INSULATED MODEL 1540-520		DATE: 6-15-09	SHEET 1 OF 2



# Section A9

A9. For a building with an attached garage:

- a) Square footage of attached garage  sq ft
- b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade
- c) Total net area of flood openings in A9.b  sq in
- d) Engineered flood openings? ☐ Yes ☐ No

- Same as Section A8, but for garage when the garage is attached to the building.
- Use the Comments area on page 2 or attach additional comments, as needed.



# Building Photographs

ELEVATION CERTIFICATE			BUILDING PHOTOGRAPHS See Instructions for Item A6.		OMB No. 1660-0008 Expiration Date: November 30, 2018	
<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>			
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:			
City	State	ZIP Code	Company NAIC Number			
<p>If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.</p>						
<p><i>Right side view of the building to be insured</i></p>			<p><i>Date the photograph was taken</i></p>			
Photo One			Photo One			
Photo One Caption			Clear Photo One			
<p><i>Left side view of the building to be insured</i></p>			<p><i>Date the photograph was taken</i></p>			
Photo Two			Photo Two			
Photo Two Caption			Clear Photo Two			

FEMA Form 086-0-33 (7/15) Replaces all previous editions. Form Page 5 of 6

(A6) An additional form for attaching photographs is provided with the new Elevation Certificate.

- 3"x3" color photographs
- Digital is acceptable
- At least two photographs showing front and rear of building
- If building is split- or multi-level, at least 2 additional photographs are needed
- Helpful to show the lowest level of the building that is above grade.



Emergency Management





# Building Photographs

ELEVATION CERTIFICATE		BUILDING PHOTOGRAPHS See Instructions for Item A6.		OMB No. 1660-0008 Expiration Date: November 30, 2018	
<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>		
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:		
City	State	ZIP Code	Company NAIC Number		
<p>If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.</p>					
<i>Right side view of the building to be insured</i>		<i>Date the photograph was taken</i>		Photo One	
Photo One Caption		Clear Photo One			
<i>Left side view of the building to be insured</i>		<i>Date the photograph was taken</i>		Photo Two	
Photo Two Caption		Clear Photo Two			

FEMA Form 086-0-33 (7/15) Replaces all previous editions. Form Page 5 of 6

- Include the date the photograph was taken
  - ◆ Must be taken within 90 days from the date of certification
- Photographs should capture key elements such as flood openings



Emergency Management





# Section B

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

B1. NFIP Community Name & Community Number

B2. County Name

B3. State

B4. Map/Panel  
Number

B5. Suffix

B6. FIRM Index  
Date

B7. FIRM Panel  
Effective/  
Revised Date

B8. Flood  
Zone(s)

B9. Base Flood Elevation(s)  
(Zone AO, use Base Flood Depth)

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: \_\_\_\_\_

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

Designation Date: \_\_\_\_\_ ☐ CBRS ☐ OPA



North Carolina Emergency Management





# Section B1-9

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number <input type="text"/>			B2. County Name <input type="text"/>		B3. State <input type="text"/>
B4. Map/Panel Number <input type="text"/>	B5. Suffix <input type="text"/>	B6. FIRM Index Date <input type="text"/>	B7. FIRM Panel Effective/ Revised Date <input type="text"/>	B8. Flood Zone(s) <input type="text"/>	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) <input type="text"/>

- Complete the Elevation Certificate on the basis of the **FIRM in effect at the time of the certification.**
- Additional &/or preliminary data may be provided in Comments Section.

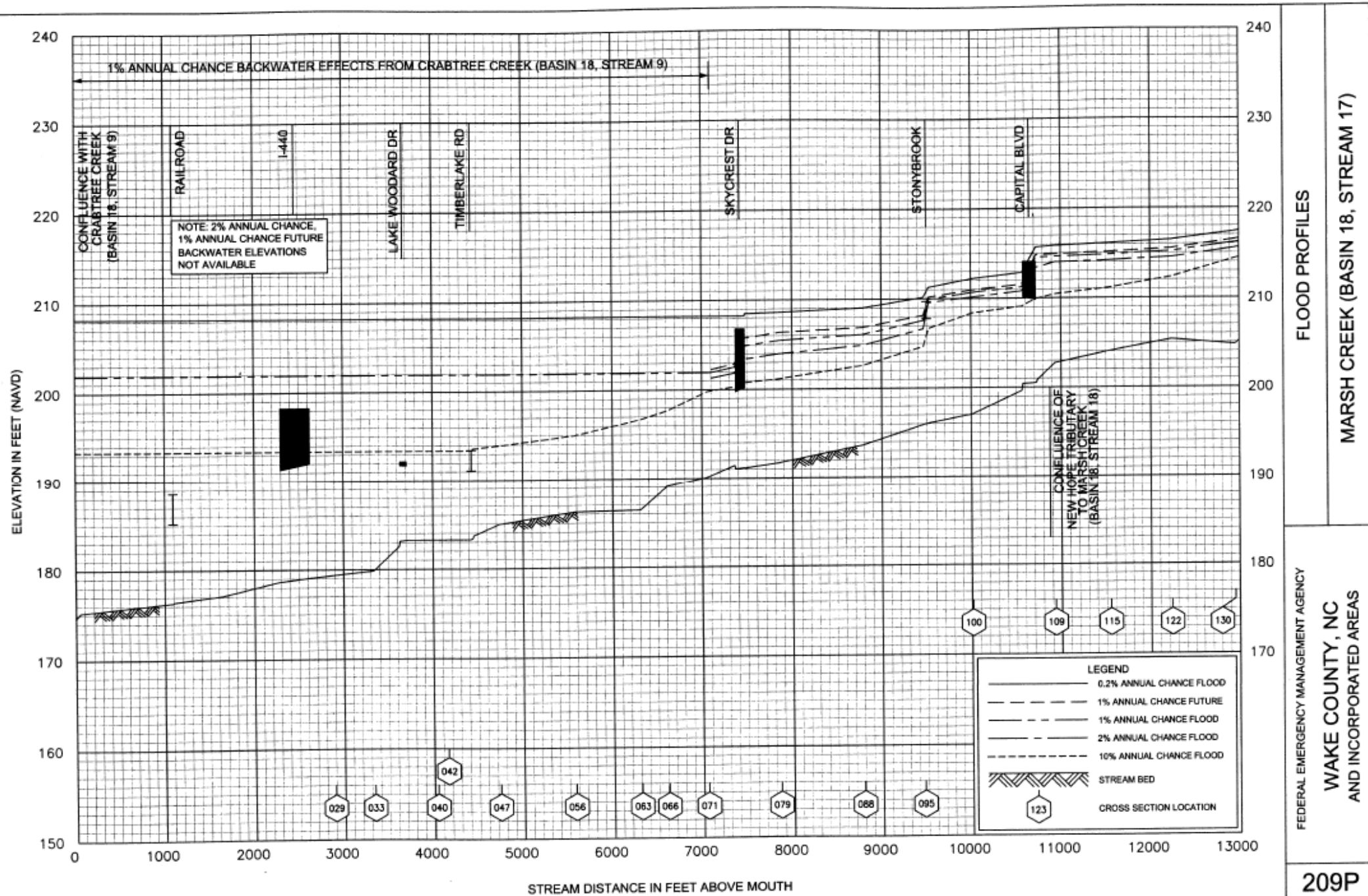


# Determining Base Flood Elevation

- Do NOT include freeboard.
- FRIS is your best source in North Carolina.
- FIRM can be used on coastal or lacustrine areas with whole-foot BFEs.
  - Confirm the stillwater elevation in the FIS, which may be up to 0.5' higher.
- AO Zones indicate DEPTH, not BFE.
- For River Profiles, read the 1% Annual-Chance or 100-Year Flood Level
- In Zone X, BFE = N/A



# FIS Profile





# FIS Profile



**250 Feet  
Upstream of  
XS 047**



# Sections B10-B12

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: \_\_\_\_\_

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

Designation Date: \_\_\_\_\_ ☐ CBRS ☐ OPA

- B10. Check the box for source of BFE data. These are listed in the order of preference. If the flooding source is riverine, the "FIS Profile" box should be selected.
- B11. Check the box for elevation datum used in Item B9. NC maps currently use NAVD 1988.
- B12. Indicate whether or not the building is located in a Coastal Barrier Resource System (CRBS) or Otherwise Protected Area (OPA). Enter the designation date & check "CBRS" or "OPA".

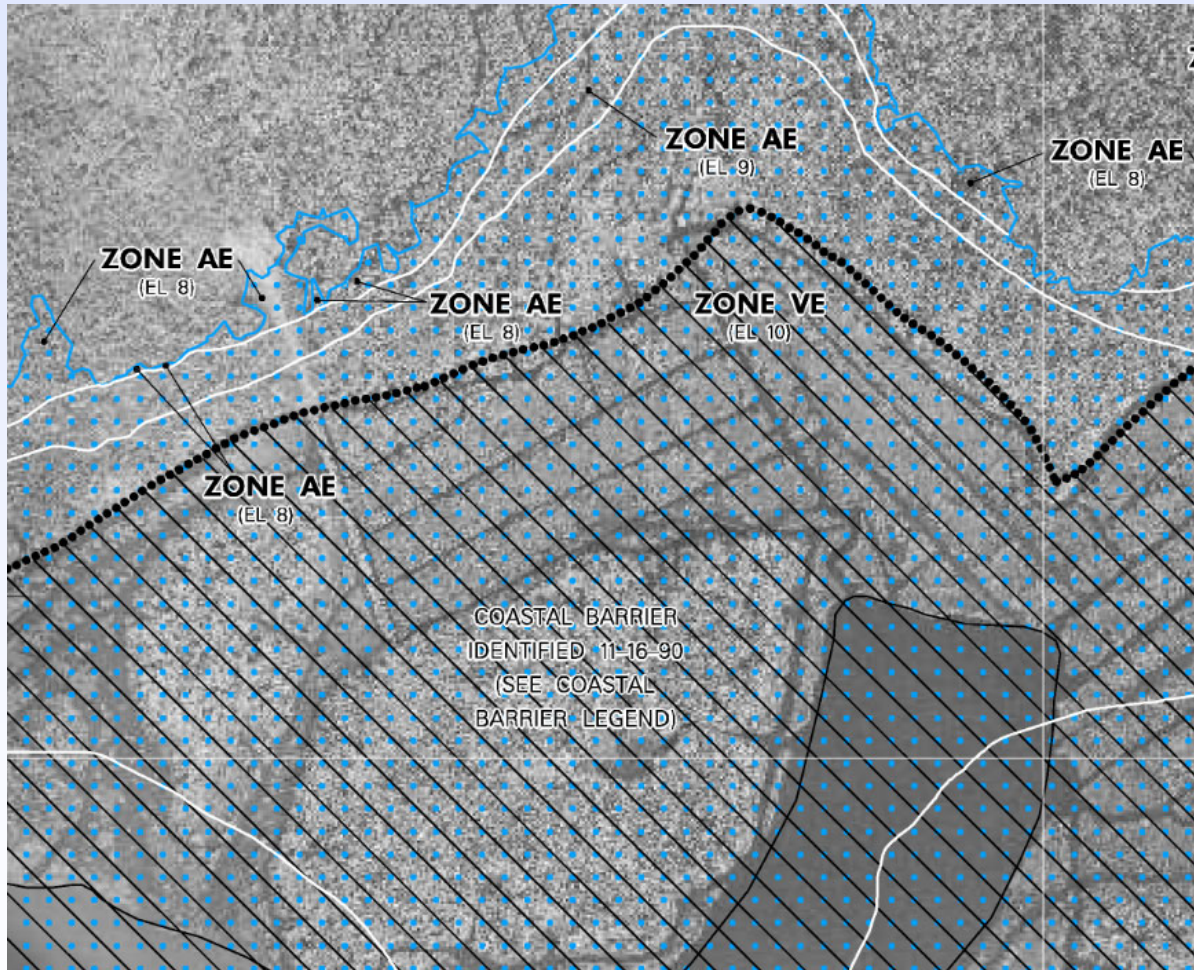


**North Carolina Emergency Management**





# Coastal Barrier Resource System Update



As of February 15, 2019, all FIRM panel data, notes, labels, and symbolization associated with CBRS and Otherwise Protected Areas should be removed from regulatory products except for the following Note to Users



# Coastal Barrier Resource System Update

Coastal Barrier Resources System (CBRS) areas and “otherwise protected areas” (OPAs) are no longer shown on this map panel, but still may be present in this community. Current information on these areas is provided by the U.S. Fish & Wildlife Service (FWS). NFIP flood insurance is not available within CBRS areas for structures that are built or substantially improved on or after the dates indicated by FWS.




# Coastal Barrier Resource System Update

Users should reference the most up-to-date information provided by FWS to determine NFIP insurance eligibility. The official maps and additional information regarding CBRS areas are provided on the FWS website at: [www.fws.gov/cbra](http://www.fws.gov/cbra). FEMA also includes the official boundaries from FWS on our interactive and dynamic flood maps available through the FEMA Map Service Center.



# Coastal Barrier Resource System Update

Data sets and additional information are now available at <https://www.fws.gov/cbra/maps/Boundaries.html>.

**U.S. Fish & Wildlife Service**




## Coastal Barrier Resources System

**Ecological Services**

**CBRS Menu**

- CBRS Home
- Legislation & Testimony
- Historical Changes
- CBRA Prohibitions
- Flood Insurance
- Official Maps and Data +
- Boundary Modifications
- Mapping Projects +
- CBRS Documentation
- Project Consultations +

**Help and Contacts**

-  **Glossary**
-  **Contact Us**
-  **Documents Library**

### Digital CBRS Boundaries


The U.S. Fish and Wildlife Service (Service) has geospatial Coastal Barrier Resources System (CBRS) boundary data available in a variety of formats. These data are representations of the CBRS boundaries shown on the [official CBRS maps](#) referenced in 16 U.S.C. 3503(a). In general, these digital boundaries can be considered accurate to within approximately 20 feet of the actual CBRS boundaries as shown on the official maps. Before using the data, please read the [metadata](#) for additional information.

Additionally, because CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit), the true seaward extent of the units is not shown. The Service is not responsible for any misuse or misinterpretation of this digital data set, including use of the data to determine eligibility for Federal funding or financial assistance. For information on obtaining an official determination of whether or not an area or specific property is located within the CBRS, please visit the [CBRS Documentation](#) web page. For information on project consultations, please visit the [Consultations](#) web page.

### Download Shapefile(s)

The CBRS data are available for download as three separate [shapefiles](#); compressed by using the [.zip](#) format. You can view the shapefiles by using ESRI's free software, among others. Information about what is contained in each shapefile and how to use it is available in the table below. The Extensible Markup Language (XML) metadata for the shapefiles are included in the zip file and are also available here: <https://www.fws.gov/cbra/Metadata.html>.

Note: Please read the [User Guide](#) (PDF) for CBRS Data prior to using the data

**DOWNLOAD** 

[Click here to download the .zip file that contains all three Shapefiles \(last updated January 31, 2019\)](#)

### Web Map Service (WMS)

Geospatial CBRS Data is available through an Open GIS Consortium (OGC) Web Map Service (WMS)

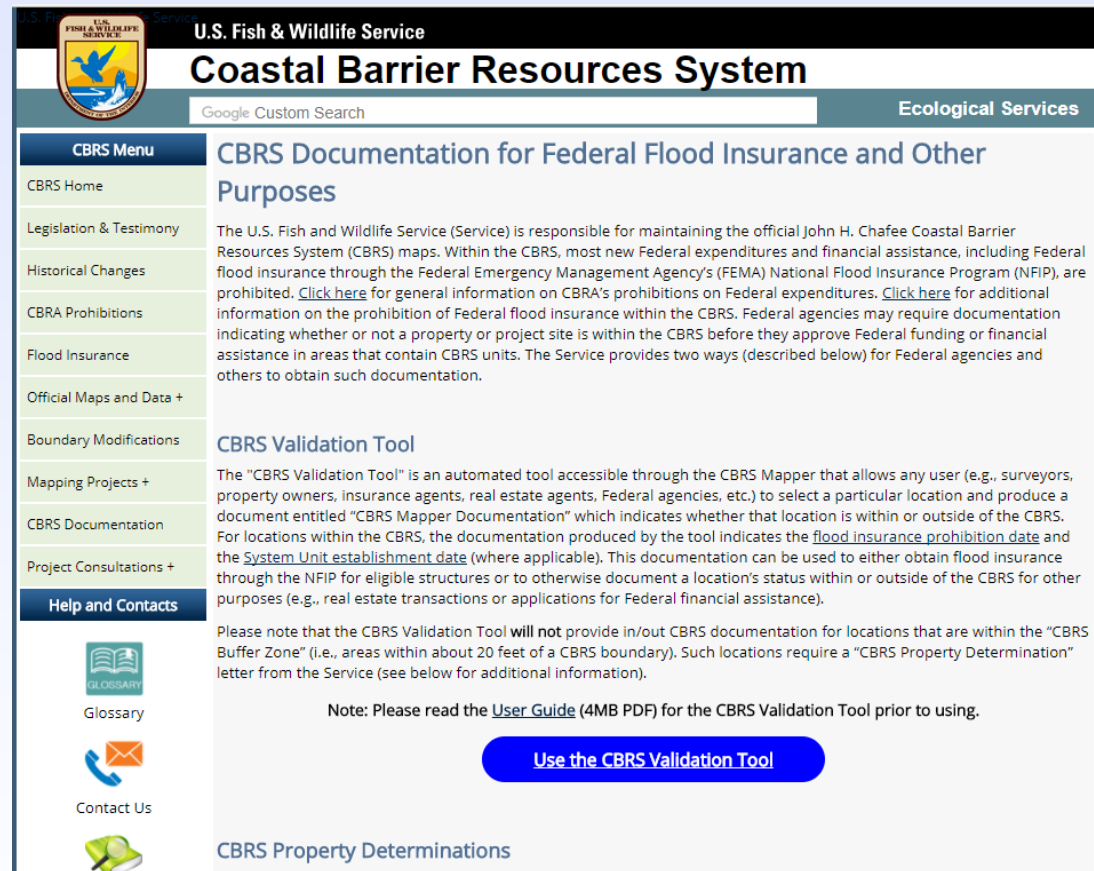
- WMS service name: CBRAMapper/GeoCBRA
- Projection: GCS, NAD83
- OGC Version: 1.3.0
- CBRS Data WMS Address:





# Coastal Barrier Resource System Update





- USFWS will continue to offer CBRS property determination letters for properties within the CBRS Buffer Zone.
- In most cases, the CBRS Validation Tool will be a faster and more convenient way to obtain the necessary information.  
<https://www.fws.gov/cbra/Documentation.html>




The screenshot shows the U.S. Fish & Wildlife Service Coastal Barrier Resources System website. The header includes the USFWS logo and the text "U.S. Fish & Wildlife Service Coastal Barrier Resources System". Below the header is a "Google Custom Search" bar and a link to "Ecological Services". The main content area is divided into two columns. The left column contains a "CBRS Menu" with links to "CBRS Home", "Legislation & Testimony", "Historical Changes", "CBRA Prohibitions", "Flood Insurance", "Official Maps and Data +", "Boundary Modifications", "Mapping Projects +", "CBRS Documentation", "Project Consultations +", and "Help and Contacts". The right column contains "CBRS Documentation for Federal Flood Insurance and Other Purposes", "CBRS Validation Tool", and "CBRS Property Determinations". The "CBRS Validation Tool" section includes a detailed description of the tool and a note about its limitations. A blue button labeled "Use the CBRS Validation Tool" is prominently displayed.



## BASEMAPS &gt;

-  STREETS
-  HYBRID
-  GRAY
-  USGS TOPO
-  USDA NAIP IMAGERY

## MAP LAYERS &gt;

- ☒ CBRS Units 
- Click [here](#) to learn more about CBRS Units.





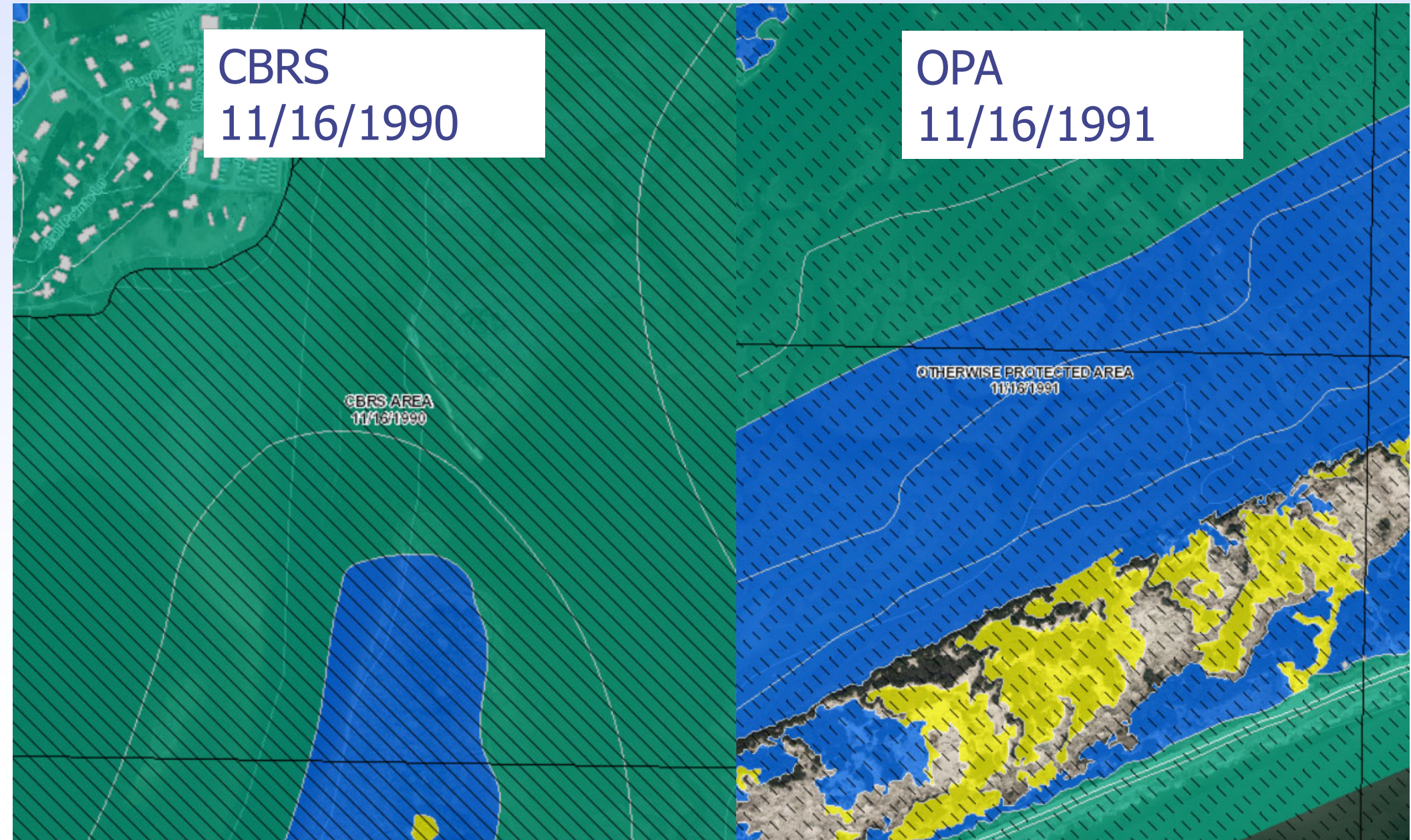
# Coastal Barrier Resource System

CBRS  
11/16/1990

OPA  
11/16/1991

CBRS AREA  
11/16/1990

OTHERWISE PROTECTED AREA  
11/16/1991





# Complete Two Ways

Either:

- SFHA Zone **with BFEs** Determined
  - Sections C & D
- SFHA Zone **with No BFE** Determined
  - Is rare in Eastern NC



# Section C (Zone has BFE)

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. In Puerto Rico only, enter meters.

Benchmark Utilized:  Vertical Datum:

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source:

**Datum used for building elevations must be the same as that used for the BFE.**

Check the measurement used.

- |   |                      |                               |                                 |
|---|----------------------|-------------------------------|---------------------------------|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor)   | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| b) Top of the next higher floor   | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| c) Bottom of the lowest horizontal structural member (V Zones only)   | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| d) Attached garage (top of slab)  | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| e) Lowest elevation of machinery or equipment servicing the building<br>(Describe type of equipment and location in Comments) | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG)  | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG)   | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support                                  | <input type="text"/> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |



# Section C1

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.

- Item C1. The elevations to be entered in this section are based on **construction drawings, a building under construction, or finished construction.**
- Use the Comments area of Section D as needed.
- “Finished Construction” is only when all machinery &/or equipment (furnaces, hot water heaters, heat pumps, air conditioners, elevators & their associated equipment) have been installed & the grading around the building is completed.



# Section C2

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. In Puerto Rico only, enter meters.

Benchmark Utilized: \_\_\_\_\_ Vertical Datum: \_\_\_\_\_

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: \_\_\_\_\_

Datum used for building elevations must be the same as that used for the BFE.

- A field survey is required for Items C2.a-h.
- Enter the Benchmark Utilized. Provide the PID or other unique identifier assigned by the maintainer of the benchmark. For GPS survey, indicate the benchmark used for the base station, the Continuously Operating Reference Stations (CORS) sites used for an On-line Positioning User Service (OPUS) solution (attach the OPUS report), or the name of the Real Time Network used.
- Note the Vertical Datum. All elevations for the certificate **must** use the same datum on which the BFE is based.



North Carolina Emergency Management





# Bench Marks

BM5510 ✕

North Carolina Geodetic Survey bench mark

BM5510 ⊗

National Geodetic Survey bench mark

BM5510 ⬡

Contractor bench mark (approved by NCGS)

- Identified by their NSRS Permanent Identifier (PID)
- To access current Bench Mark elevation, description, & location information, go to:
- NC Geodetic Survey website: [www.ncgs.state.nc.us](http://www.ncgs.state.nc.us)
- Or
- National Geodetic Survey website: [www.ngs.noaa.gov](http://www.ngs.noaa.gov)




**North Carolina Emergency Management**





# Datum Conversion

<https://geodesy.noaa.gov/NCAT/>



## NGS Coordinate Conversion and Transformation Tool (NCAT)

National Geodetic Survey

[NGS Home](#) [About NGS](#) [Data & Imagery](#) [Tools](#) [Surveys](#) [Science & Education](#)

[Single Point Conversion](#) [Multipoint Conversion](#) [Web services](#) [Downloads](#) [About Conversion Tool](#)

Convert/Transform from:

☐ Horizontal

☒ Horizontal+height

☐ XYZ

Select the type of horizontal coordinate:

☐ Geodetic lat-long

☐ SPC

☐ UTM

☐ USNG

Select a height

☐ Ellipsoidal

☒ Orthometric

Units of height

Meters

Input reference frame  
(historically called 'horizontal datum')

NAD83(2011)

Input geopotential datum  
(historically called 'vertical datum')

NAVD88

SPC zone

Auto Pick (default zone)

UTM zone

Auto Pick (default zone)

Output reference frame  
(historically called 'horizontal datum')

NAD83(2011)

Output geopotential datum  
(historically called 'vertical datum')

NAVD88

For faster processing, uncheck the coordinates you don't need in the output; "N/A" is filled in for an unchecked coordinate

☒ SPC

☒ UTM

☒ USNG

☒ XYZ

Upload Format: A comma-delimited text file with the following data elements; only '.txt', '.text', or '.csv' extensions are accepted

Upload data to be converted

Results are ready for download after a "Done" message appears

+ Choose

[NOS Home](#) • [NGS Employees](#) • [Privacy Policy](#) • [Disclaimer](#) • [USA.gov](#) • [Ready.gov](#) • [Site Map](#) • [Contact Webmaster](#)



# Datum Conversion

<https://geodesy.noaa.gov/NCAT/>



## NGS Coordinate Conversion and Transformation Tool (NCAT)

National Geodetic Survey

NGS Home About NGS Data & Imagery Tools Surveys Science & Education Search

Single Point Conversion

Multipoint Conversion

Web services

Downloads

About Conversion Tool

Convert/Transform from:

☒ Horizontal

☐ Horizontal+height

☐ XYZ

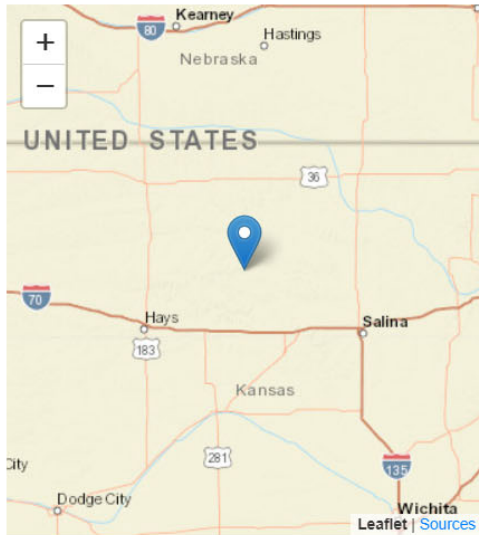
Select the type of horizontal coordinate:

☒ Geodetic lat-long

☐ SPC

☐ UTM

☐ USNG



Enter lat-lon in decimal degrees

Lat

Lon

or degrees-minutes-seconds

Lat

Lon

or drag map marker to a location of interest

Input reference frame  
(historically called 'horizontal datum')

Output reference frame  
(historically called 'horizontal datum')

Don't see a reference frame in the list?  
Click [here](#) to learn more.

SPC zone

Submit



North Carolina Emergency Management





# Section C2.a-d

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
b) Top of the next higher floor	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
c) Bottom of the lowest horizontal structural member (V Zones only)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
d) Attached garage (top of slab)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters

- Items C2.a-c. Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7).
- If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d.
- If any item does not apply to the building, enter "N/A" for not applicable.



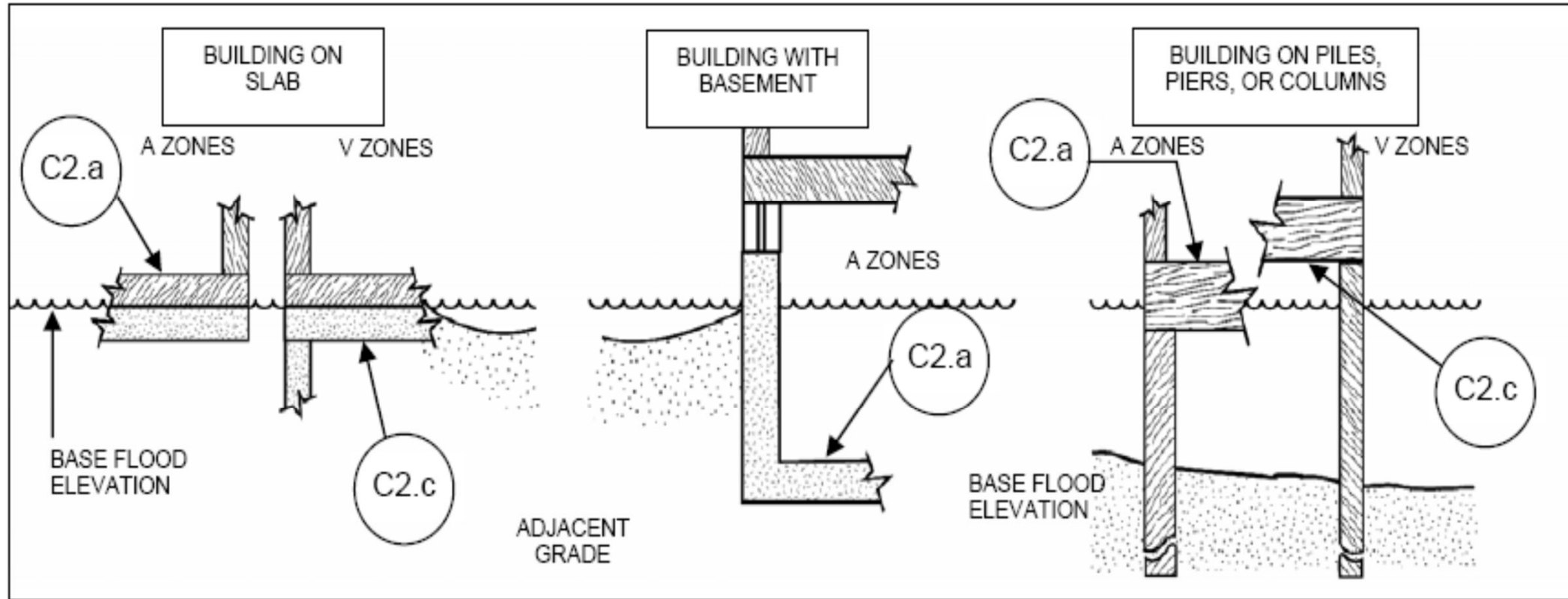
# Section C2.a-d

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
b) Top of the next higher floor	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
c) Bottom of the lowest horizontal structural member (V Zones only)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
d) Attached garage (top of slab)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters

- For buildings in **A** zones: elevations should be measured at the **top of the floor.**
- For buildings in **V** zones: Item C2.c. Elevation c must be measured at **the bottom of the lowest horizontal structural member of the floor.**
- For buildings elevated on a crawlspace enter the elevation of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents).



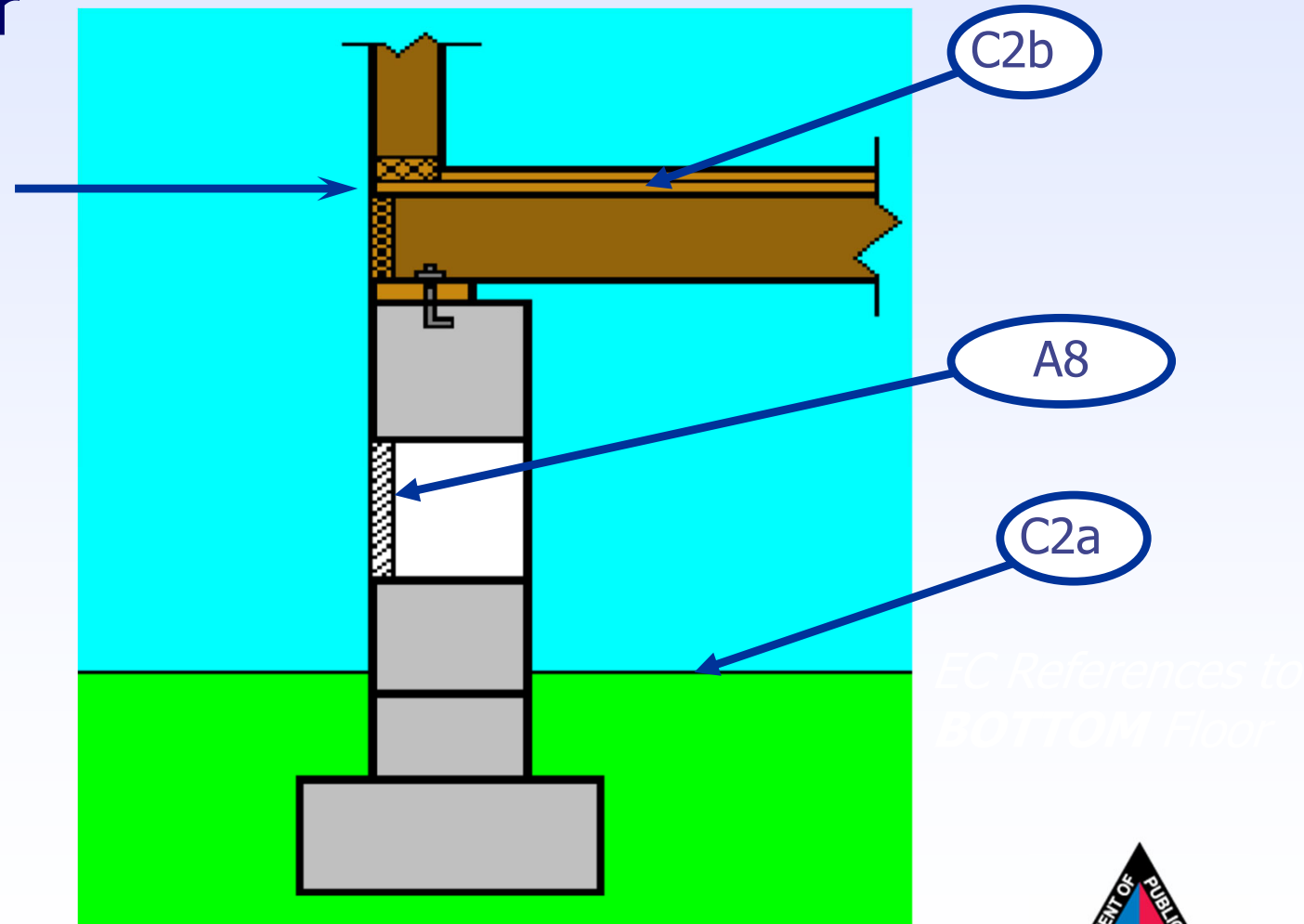
# Section C2.a and C2.c





# Lowest Floor in ZONE A, AE, AH & A1-30

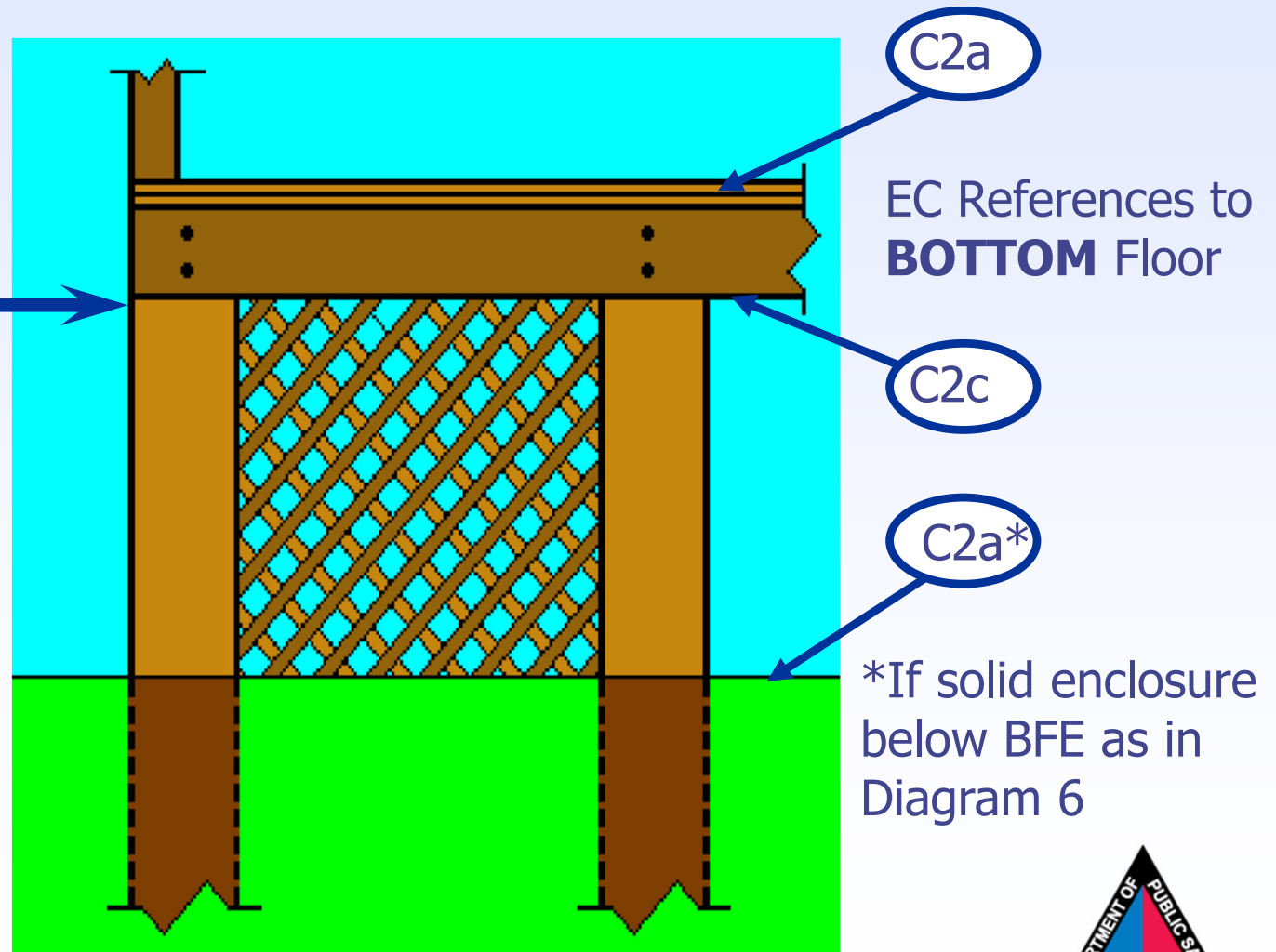
The lowest floor is measured at the top of the sub-floor, slab or grade for regulatory and flood insurance purposes





# Lowest Floor in ZONE V, & VE

Bottom of the  
lowest horizontal  
structural  
member  
supporting the  
lowest floor





# Section C (Zone has BFE)

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. In Puerto Rico only, enter meters.

Benchmark Utilized: \_\_\_\_\_ Vertical Datum: \_\_\_\_\_

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: \_\_\_\_\_

Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

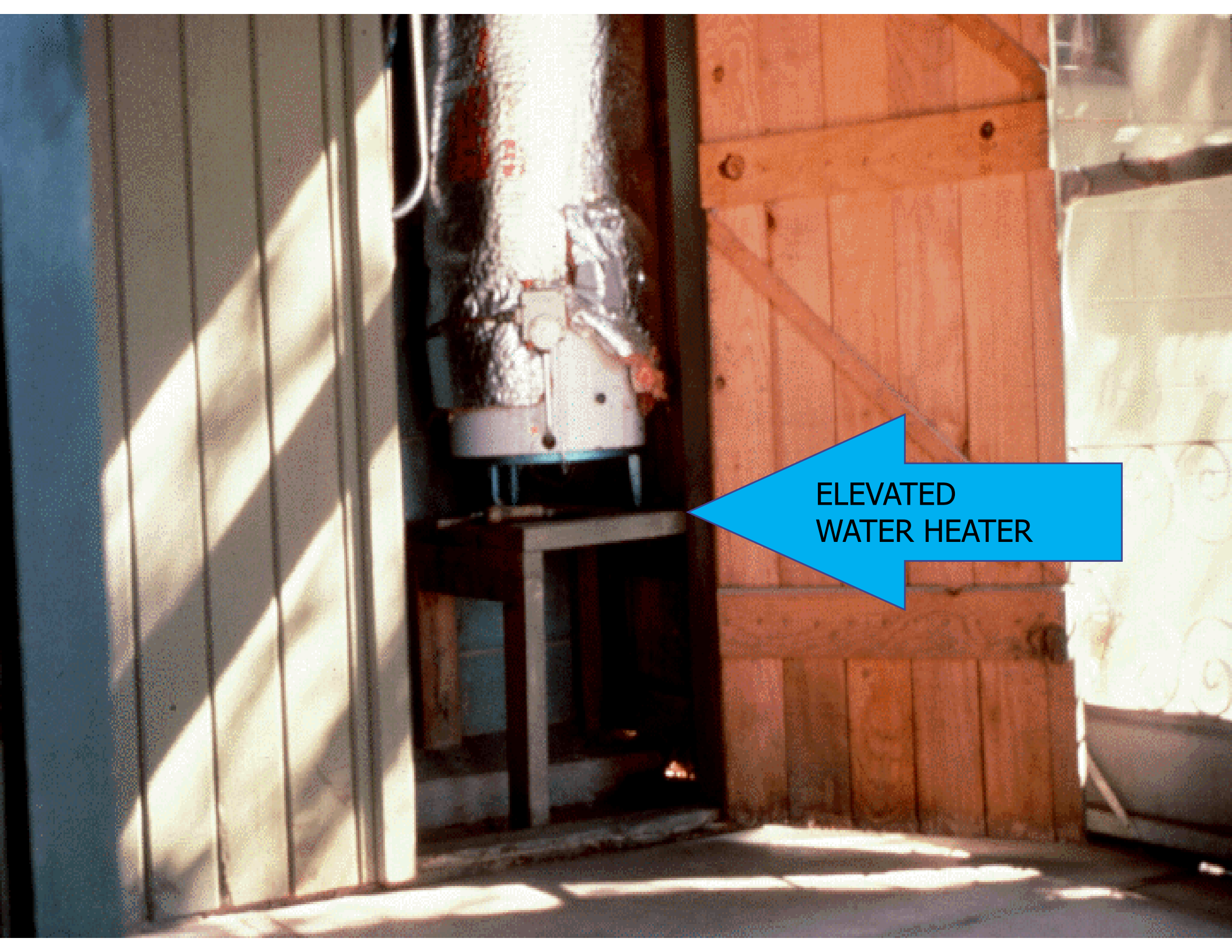
- |   |       |                               |                                 |
|---|-------|-------------------------------|---------------------------------|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor)   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| b) Top of the next higher floor   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| c) Bottom of the lowest horizontal structural member (V Zones only)   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| d) Attached garage (top of slab)  | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| e) Lowest elevation of machinery or equipment servicing the building<br>(Describe type of equipment and location in Comments) | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG)  | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG)   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support                                  | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |





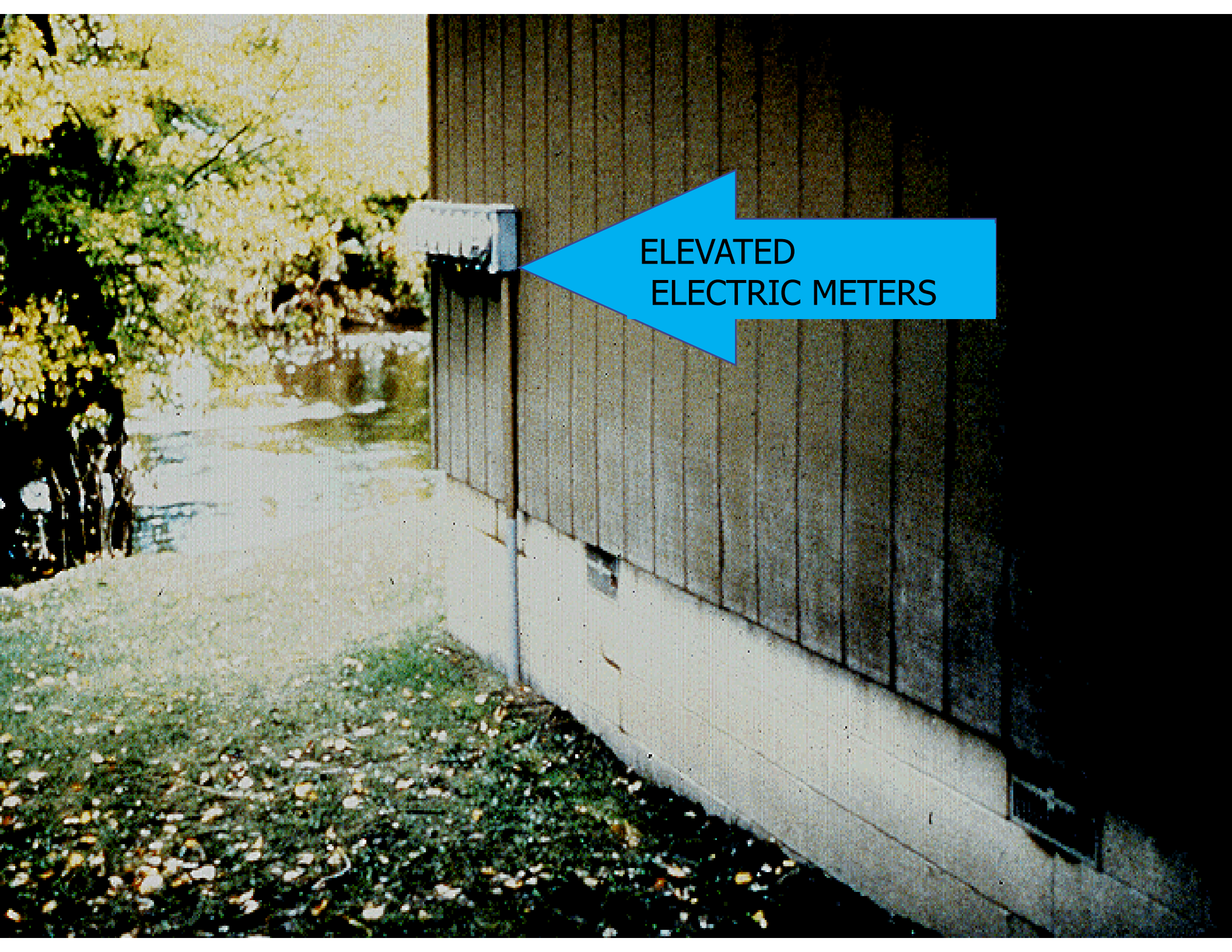
ELEVATED  
AIR CONDITIONER





ELEVATED  
WATER HEATER





ELEVATED  
ELECTRIC METERS



- Compliant: elevated equipment and ducts; anchored tank

















# Section C2.f-h

f) Lowest adjacent (finished) grade next to building (LAG)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
g) Highest adjacent (finished) grade next to building (HAG)	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	<input type="text"/>	<input type="checkbox"/> feet	<input type="checkbox"/> meters

- Item C2.f. Enter the lowest elevation of the ground, sidewalk, or patio slab immediately next to the building.
- Item C2.g. Enter the highest elevation of the ground, sidewalk, or patio slab immediately next to the building.
- Item C2.h. Enter the lowest grade elevation at the deck support, or stairs.

**These measurements must be to the nearest tenth of a foot.**



# Section D

**Official certification required**

## SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No ☐ Check here if attachments.

12/31/2006

Certifier's Name

License Number

Title

Company Name

Address

City

State

ZIP Code

Signature

Date

Telephone

Ext.





**North Carolina Emergency Management**





# Section D (cont.)

Signature	Date	Telephone	Ext.
			
Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.			
Comments (including type of equipment and location, per C2(e), if applicable)			
			

- *Use this comment section to provide additional information, as appropriate.*
- *USE....USE.....USE*



# Section E

## SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawlspace, or enclosure) is  ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- b) Top of bottom floor (including basement, crawlspace, or enclosure) is  ☐ feet ☐ meters ☐ above or ☐ below the LAG.
- E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is  ☐ feet ☐ ☐ above or ☐ below the HAG.
- E3. Attached garage (top of slab) is  ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is  ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

▪ *Complete this section if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C.*



**North Carolina Emergency Management**





# Section F (if zone has no BFE)

(very rare in Eastern NC)

## SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Address	City	State	ZIP Code
Signature	Date	Telephone	
Comments			

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, & E. The address entered in this section must be the **actual mailing address** of the property owner or property owner's representative who provided the information on the certificate.





# Section G (All Zones)

## SECTION G – COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

- G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3. ☐ The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number

G5. Date Permit Issued

G6. Date Certificate of  
Compliance/Occupancy Issued

- *Community officials can transfer information from a previously certified document.*



**North Carolina Emergency Management**





# Section G (All Zones)

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building:  ☐ feet ☐ meters Datum

G9. BFE or (in Zone AO) depth of flooding at the building site:  ☐ feet ☐ meters Datum

G10. Community's design flood elevation:  ☐ feet ☐ meters Datum

Local Official's Name	Title
<input type="text"/>	<input type="text"/>

Community Name	Telephone
<input type="text"/>	<input type="text"/>

Signature	Date
<input type="text"/>	<input type="text"/>

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





# Photographs

## BUILDING PHOTOGRAPHS

See Instructions for Item A6.

OMB No. 1660-0008

Expiration Date: November 30, 2018

### ELEVATION CERTIFICATE

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:	
City	State	ZIP Code	Company NAIC Number	
If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. <u>Identify all photographs with date taken: "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."</u> When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.				

**At least 2 color photographs, 3" x 3"**  
**EC requires foundation vent photos**



**North Carolina Emergency Management**





# Question 1

*The main purpose of the Elevation Certificates is to certify a building's compliance with local floodplain regulations.*

\_\_\_ True  
\_\_\_ False



# Answer 1

*The main purpose of the Elevation Certificates is to certify a building's compliance with local floodplain regulations.*

☐ True  
☒ False

*The Elevation Certificate is mainly used by the insurance company to rate the building for flood insurance.*



**North Carolina Emergency Management**





# Question 2

*The elevation data recorded in Section C must be certified by a surveyor, engineer, or architect (as allowed by state law).*

\_\_\_ True  
\_\_\_ False



# Answer 2

*The elevation data recorded in Section C must be certified by a surveyor, engineer, or architect (as allowed by state law).*

  X   True  
      False

*In **NC** must be a Surveyor for a Building Under Construction or Finished Construction.*



# Question 3

*Before accepting an Elevation Certificate, a community official should carefully review all the data entries to ensure it was filled out correctly.*

\_\_\_ True  
\_\_\_ False



# Answer 3

*Before accepting an Elevation Certificate, a community official should carefully review all the data entries to ensure it was filled out correctly.*

  X   True  
     False





# Question 4

*If a building does not have permanent flood openings, Items A8 and A9 should be left blank.*

\_\_\_ True  
\_\_\_ False



# Answer 4

*If a building does not have permanent flood openings, Items A8 and A9 should be left blank.*

☐ True  
☒ False

*The surveyor must enter N/A*



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# Question 5

*Always use the outside grade when determining the bottom of the vent is within the 1 foot.*

\_\_\_ True  
\_\_\_ False



# Answer 5

*Always use the outside grade when determining the bottom of the vent is within the 1 foot.*

☐ True  
☒ False

*Must be no more than 1.0 foot above the higher of the exterior or interior grade.*



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# Question 6

*A "0" for Item C2e indicates that there is no machinery or equipment servicing the building.*

\_\_\_ True  
\_\_\_ False



# Answer 6

*A "0" for Item C2e indicates that there is no machinery or equipment servicing the building.*

     True  
  X   False

*The Surveyor must enter N/A*

*Use comments please!*



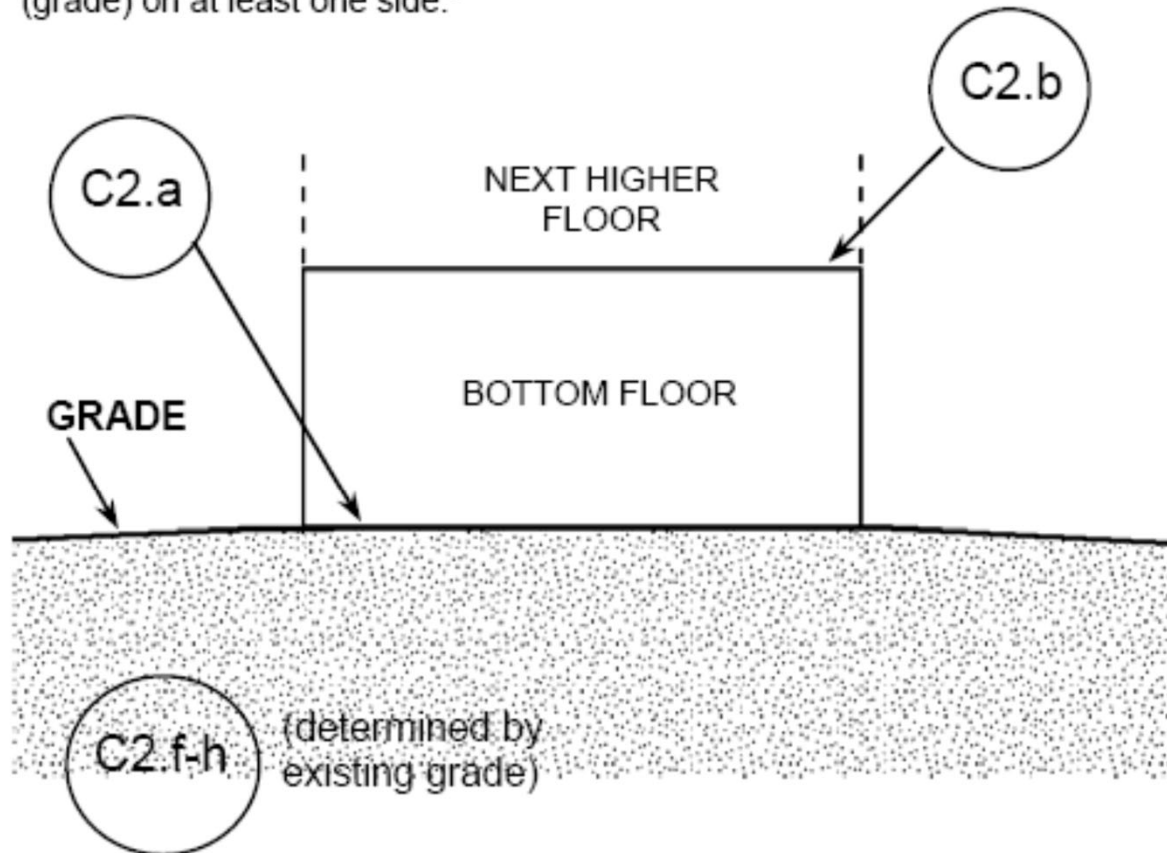


# Building Diagram 1A

## DIAGRAM 1A

All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least one side.\*









# Slab-on-grade one-story building with attached garage



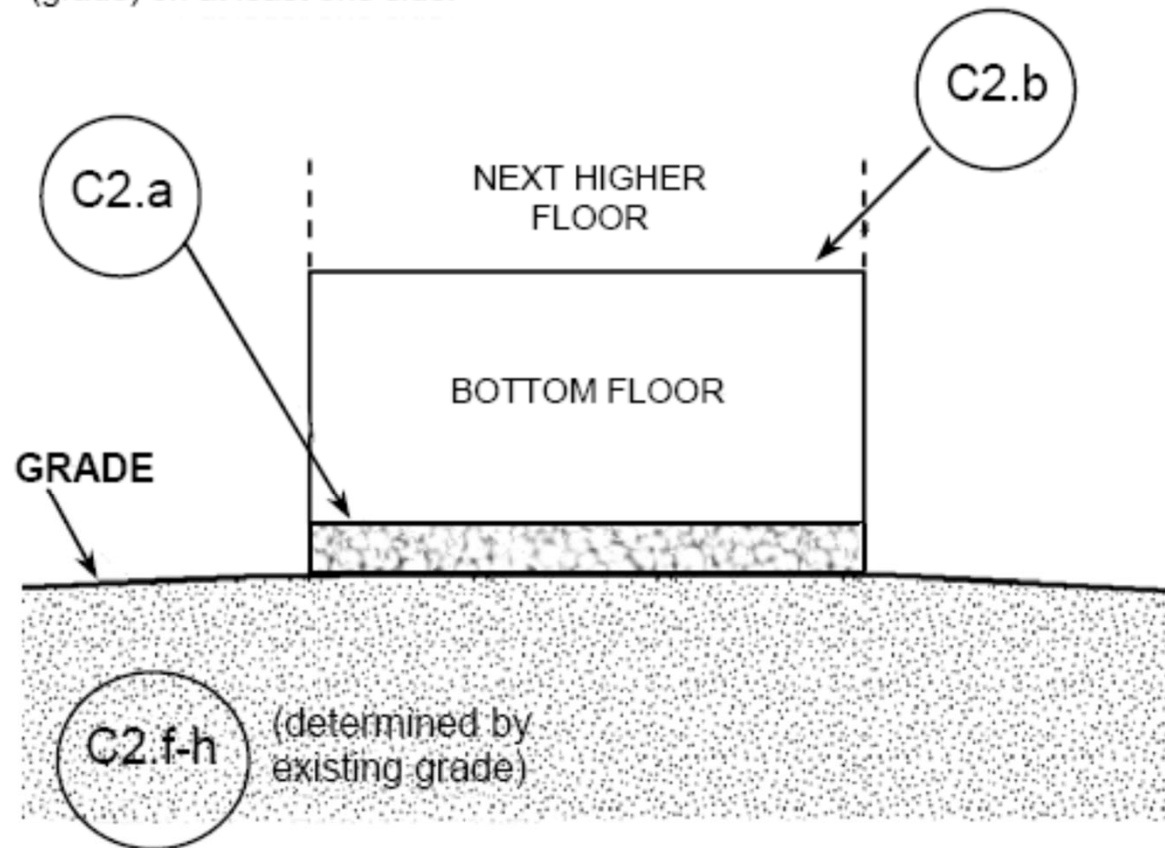


# Building Diagram 1B

**DIAGRAM 1B**

All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split-level), either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least one side.\*





# Slab on stem wall with fill



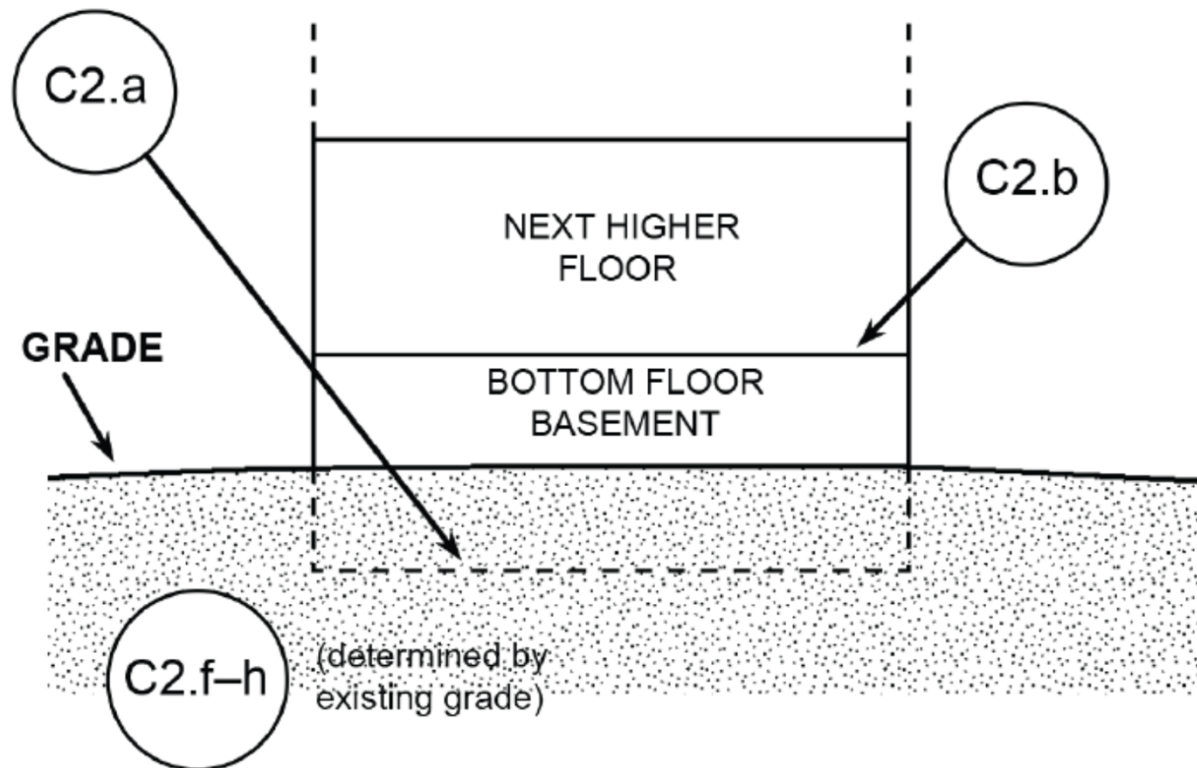


# Building Diagram 2A

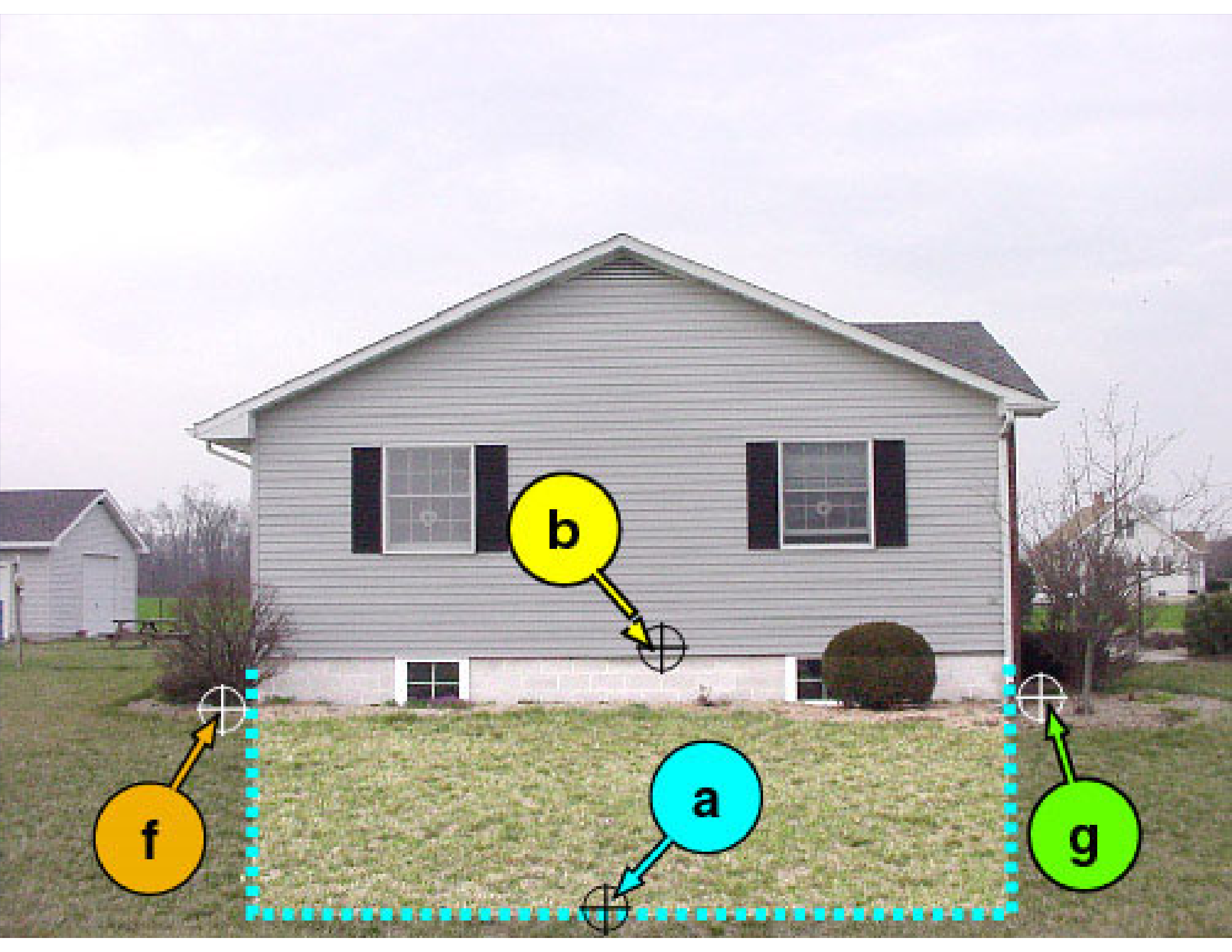
## DIAGRAM 2A

All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.\*









# Which Diagram Do You Use?



## Sloping sites

**Buildings on solid perimeter foundation walls that are set into a sloping site present another special situation with respect to installation of openings. Careful attention must be paid to the following:**

***The interior floor along the lower side of a building that is set into a sloping site must be at or above the exterior grade across the entire length of that side of the building, otherwise the enclosure becomes a basement.***

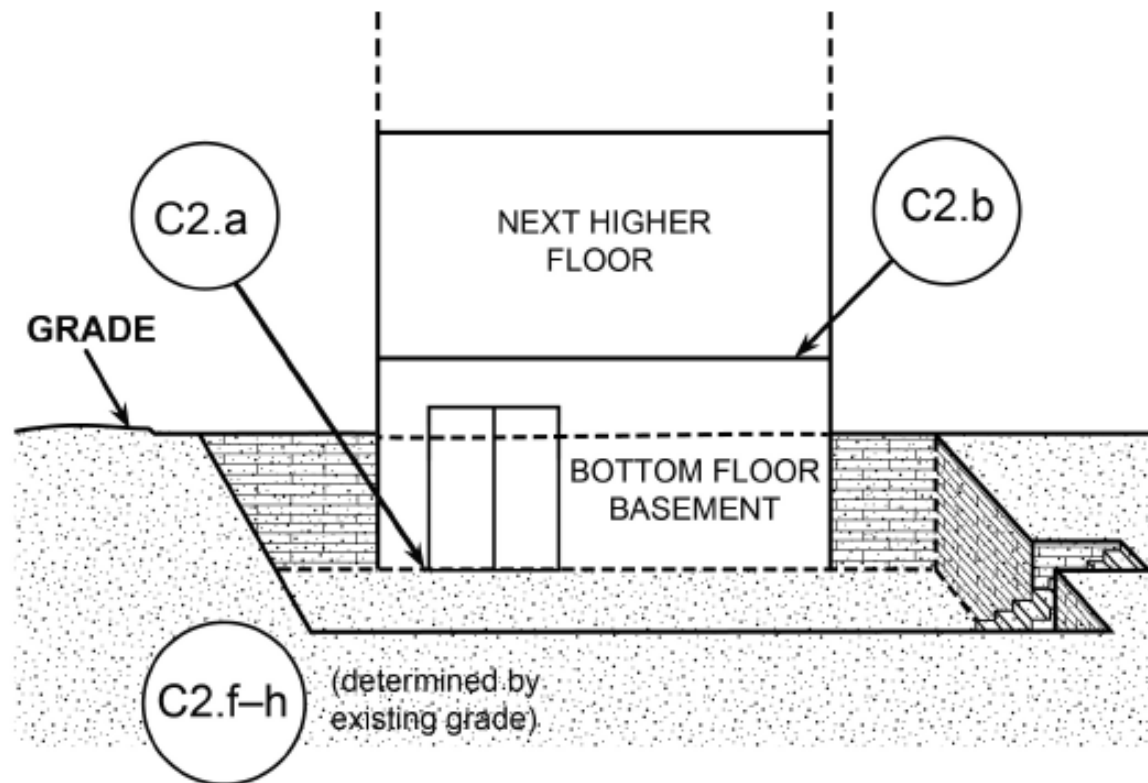


# Building Diagram 2B

## DIAGRAM 2B

**All single-and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage).**

**Distinguishing feature** - The bottom floor (basement or under ground garage) is below ground level (grade) on all sides; most of the height of the walls are below ground level on all sides and the door and area of egress is also below ground level on all sides.\*







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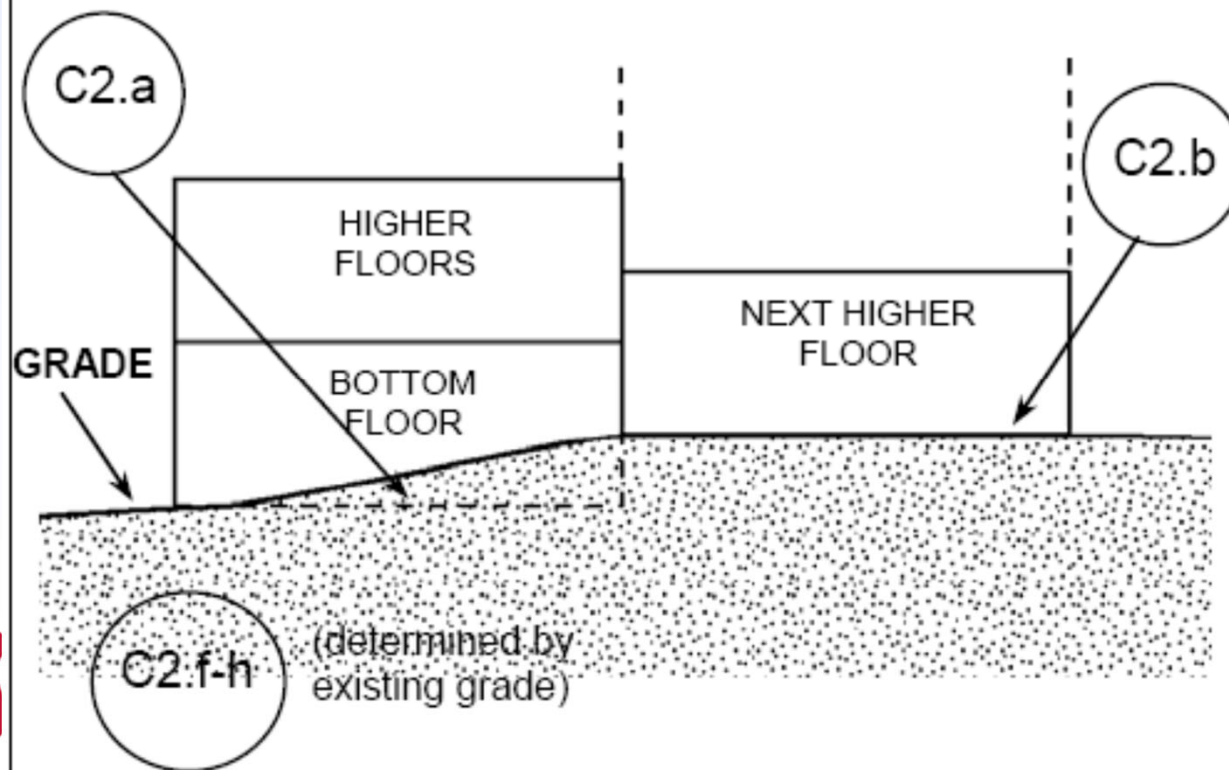


# Building Diagram 3

## DIAGRAM 3

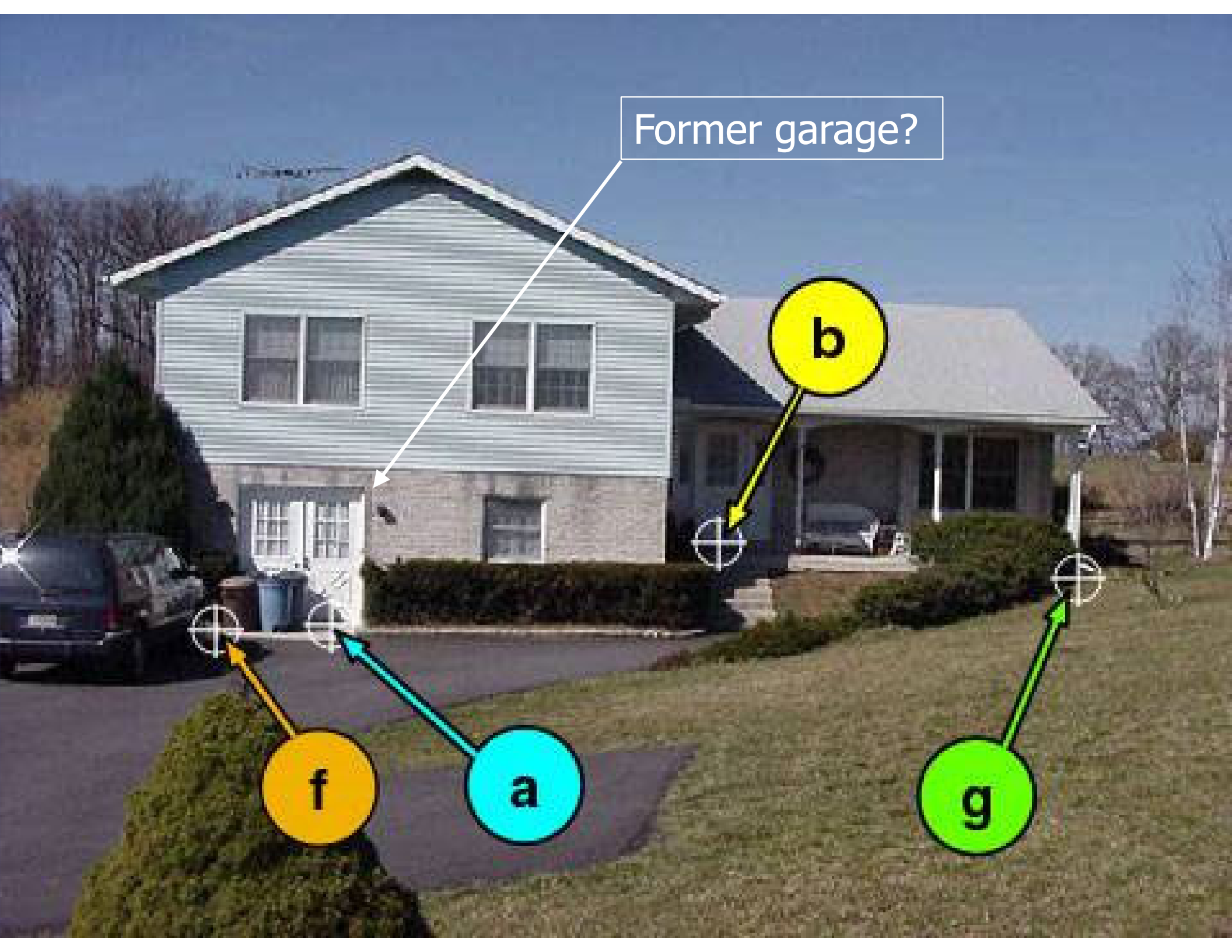
All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (excluding garage) is at or above ground level (grade) on at least one side.\*





Former garage?



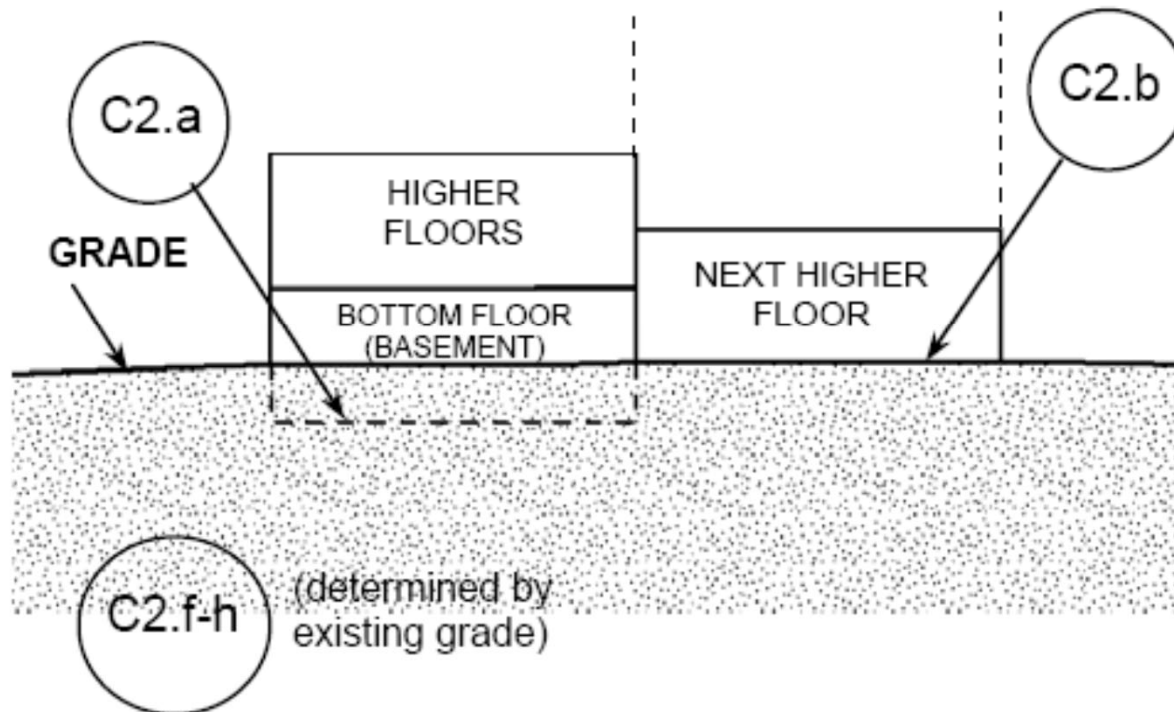


# Building Diagram 4

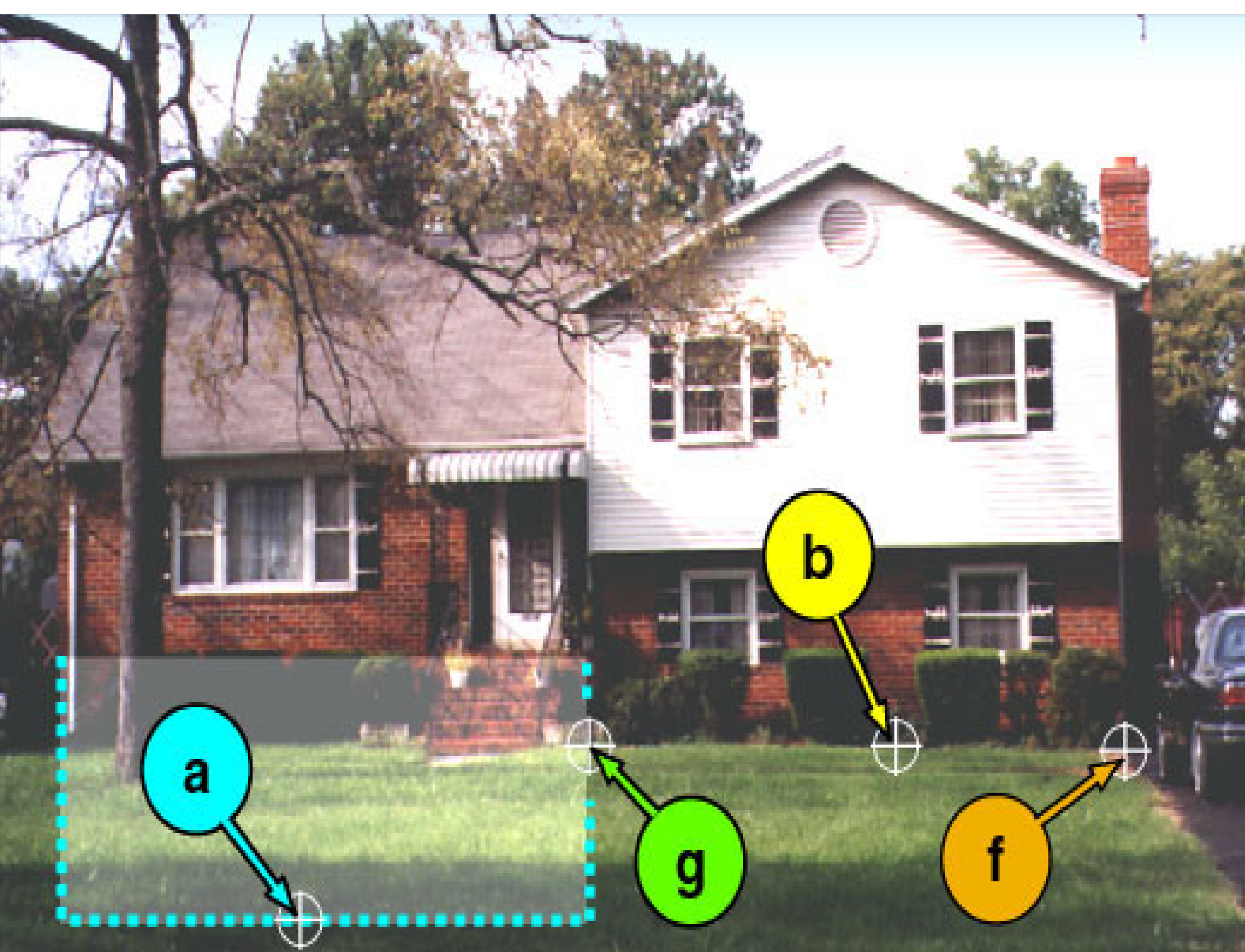
## DIAGRAM 4

All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.\*







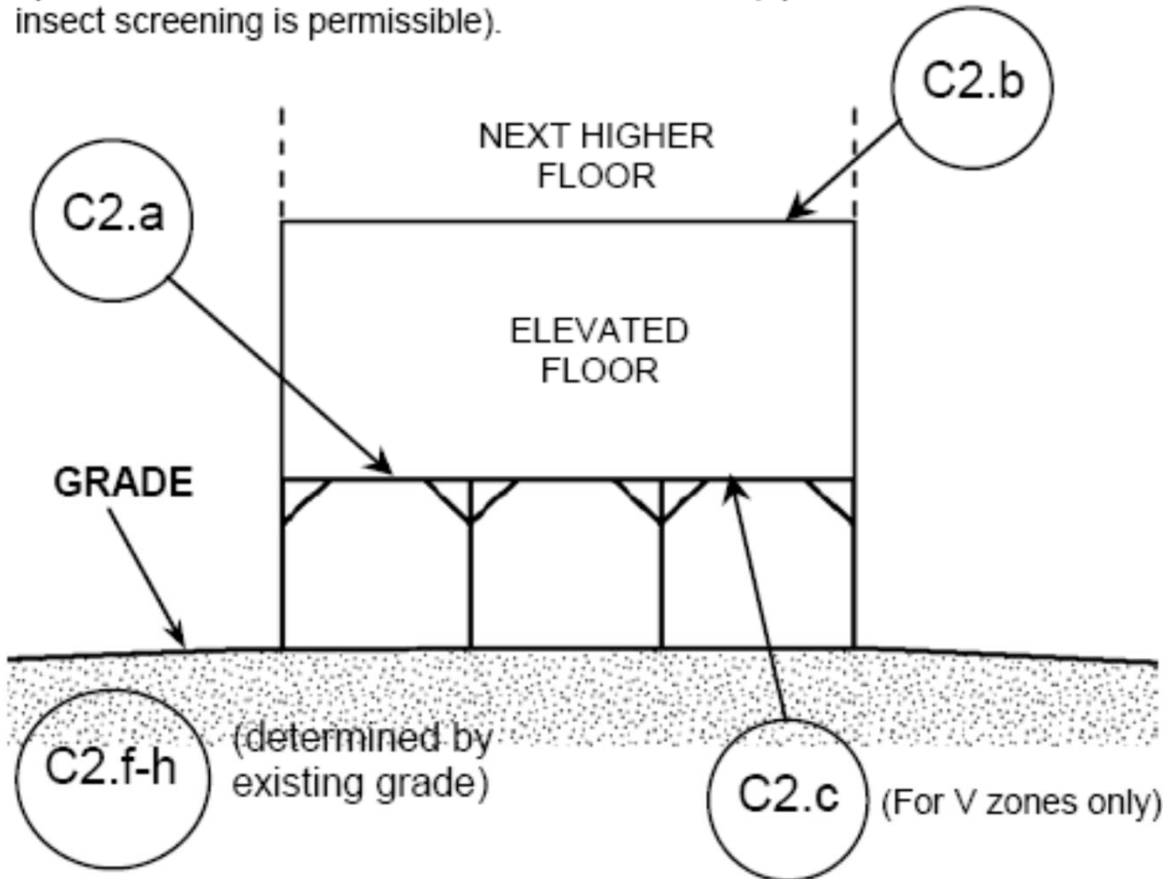


# Building Diagram 5

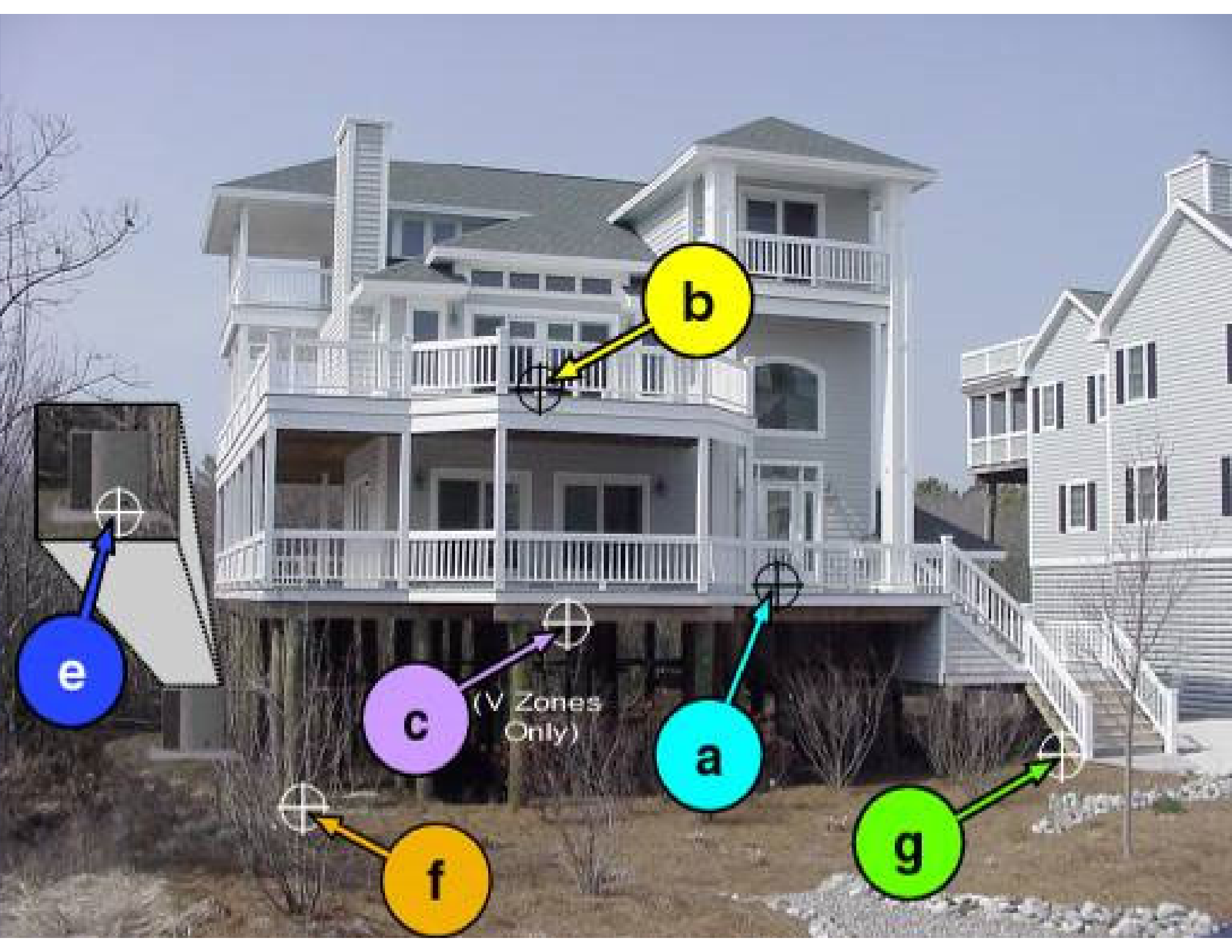
## DIAGRAM 5

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

**Distinguishing Feature** – For all zones, the area below the elevated floor is open, with no obstruction to flow of flood waters (open lattice work and/or insect screening is permissible).







**b**

**c**

(V Zones Only)

**a**

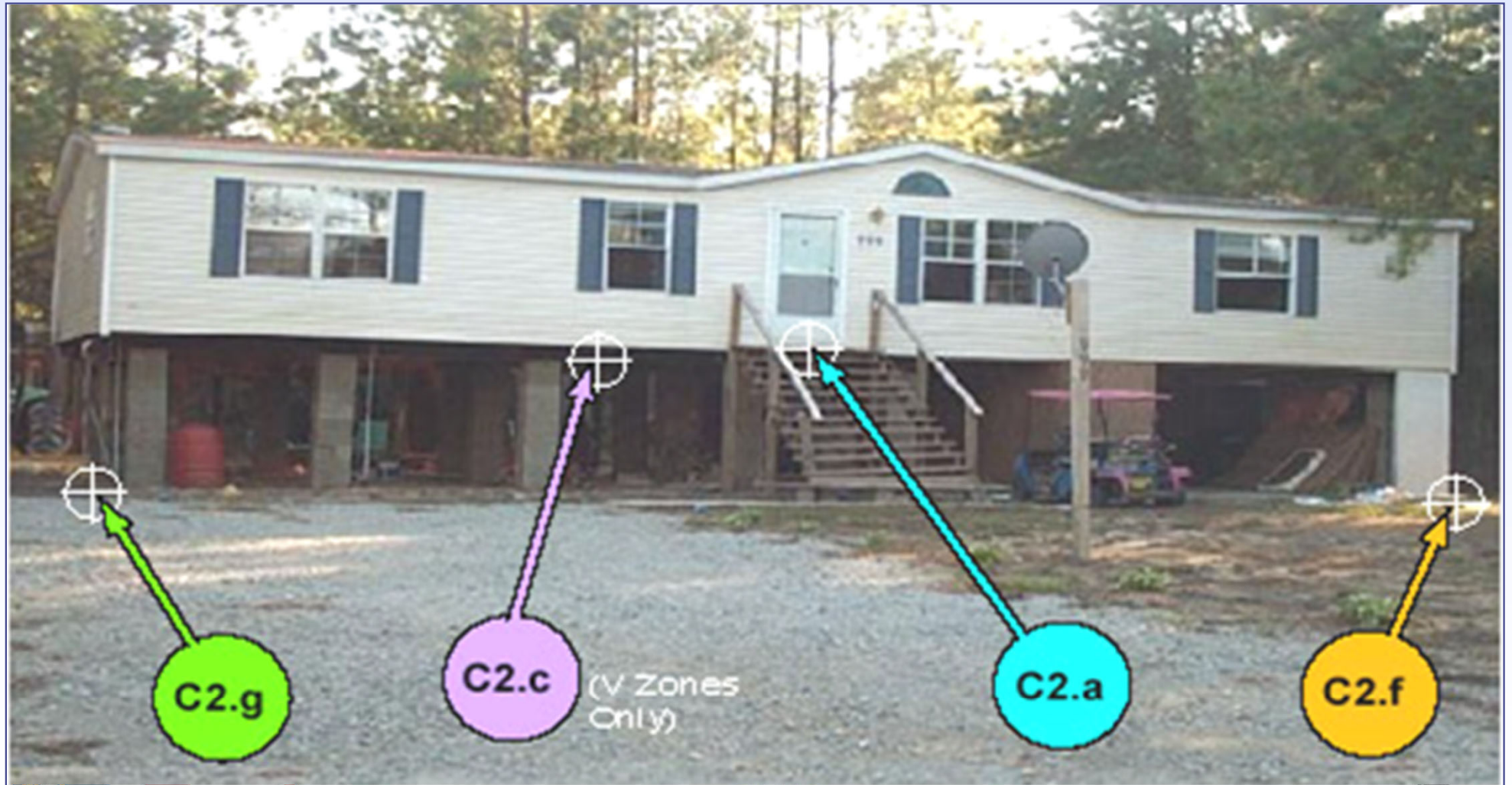
**f**

**g**

**e**



# Manufactured home elevated on pier foundation





# Which Diagram is it?

*Diagram 5 - Hanging Floor*



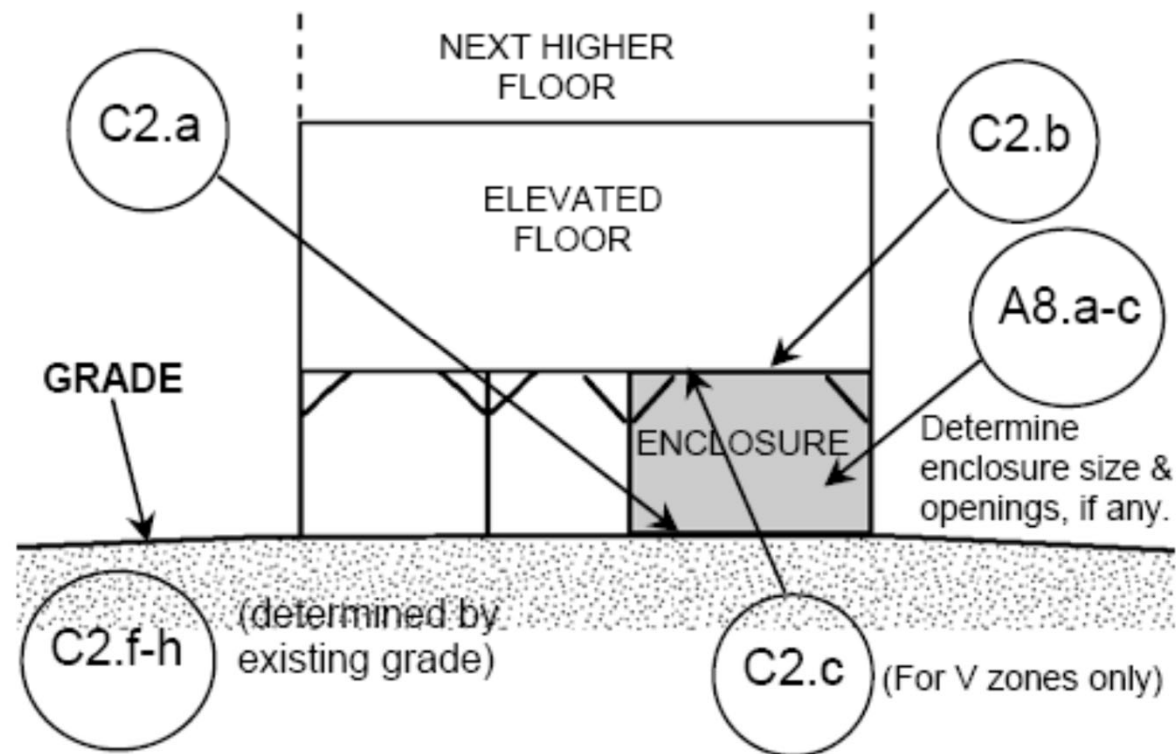


# Building Diagram 6

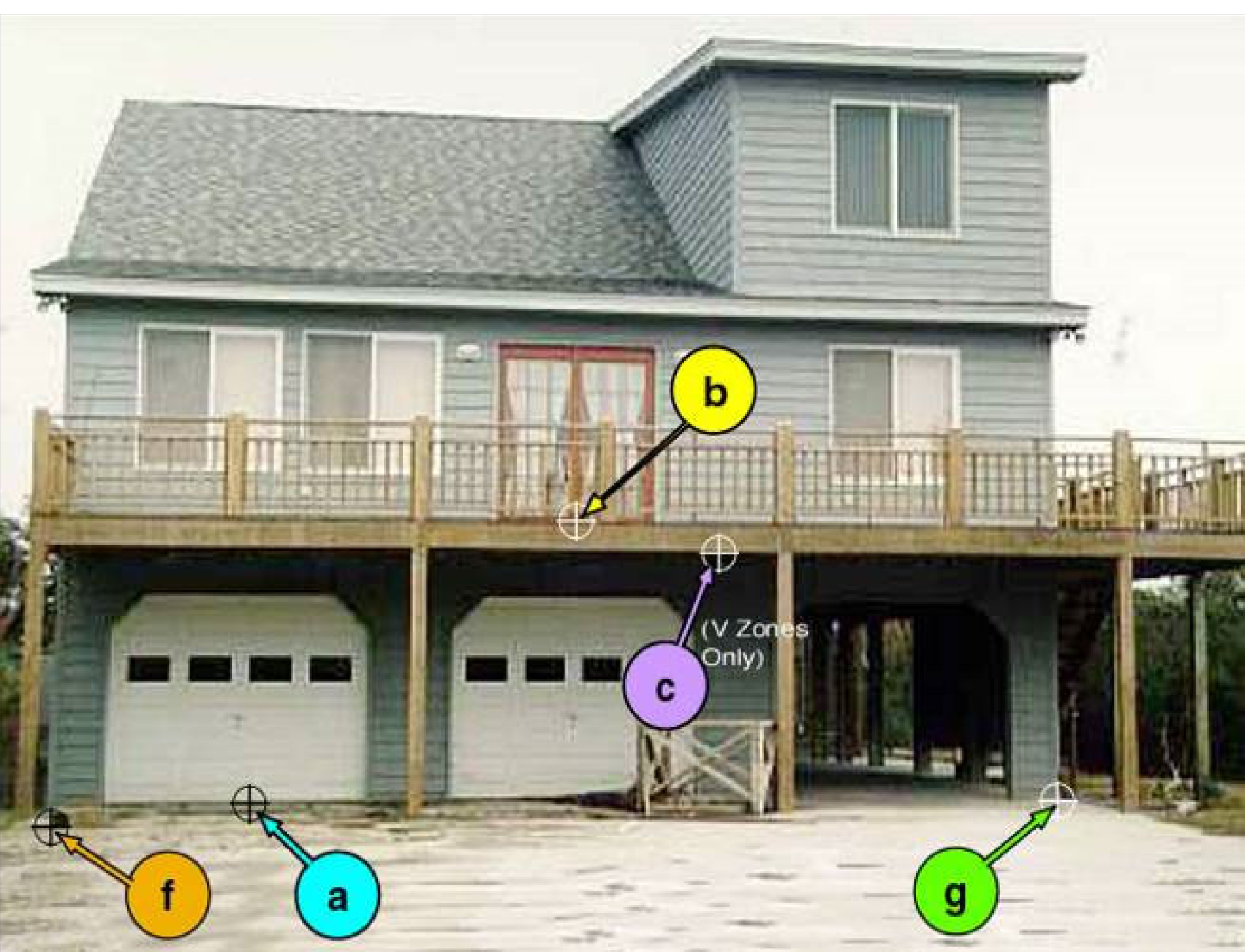
**DIAGRAM 6**

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.







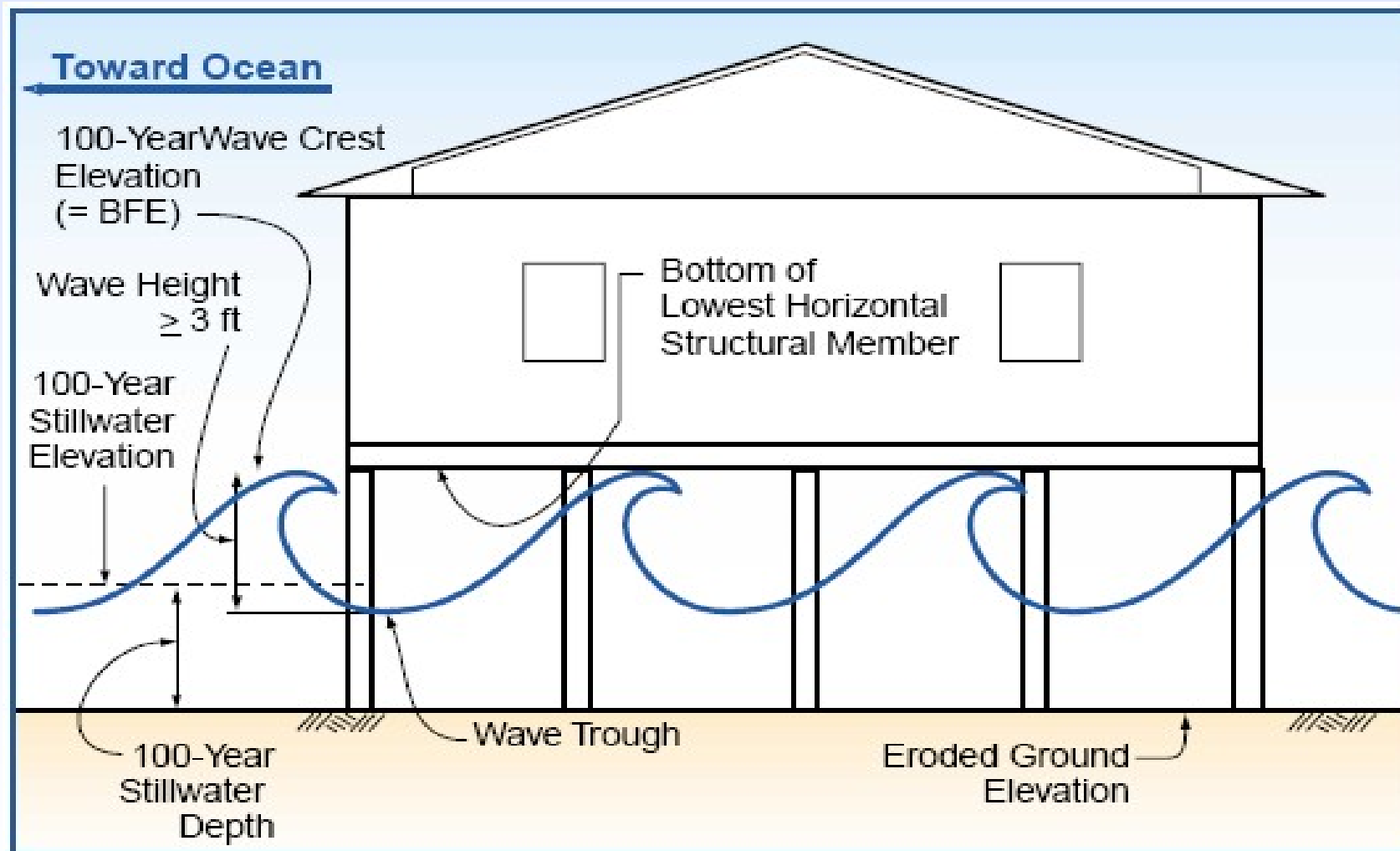


# In V zones, Enclosures must be designed to be Breakaway Walls

- Collapse under wind and water loads without causing collapse, displacement, or structural damage to the elevated portion of the building or supporting foundation.
- Design safe loading resistance of not less than 10 and no more than 20 pounds per square foot.
- Is Not Part of the Structural Support of the Building



# NFIP: V Zone Elevation





# Free-of-Obstruction

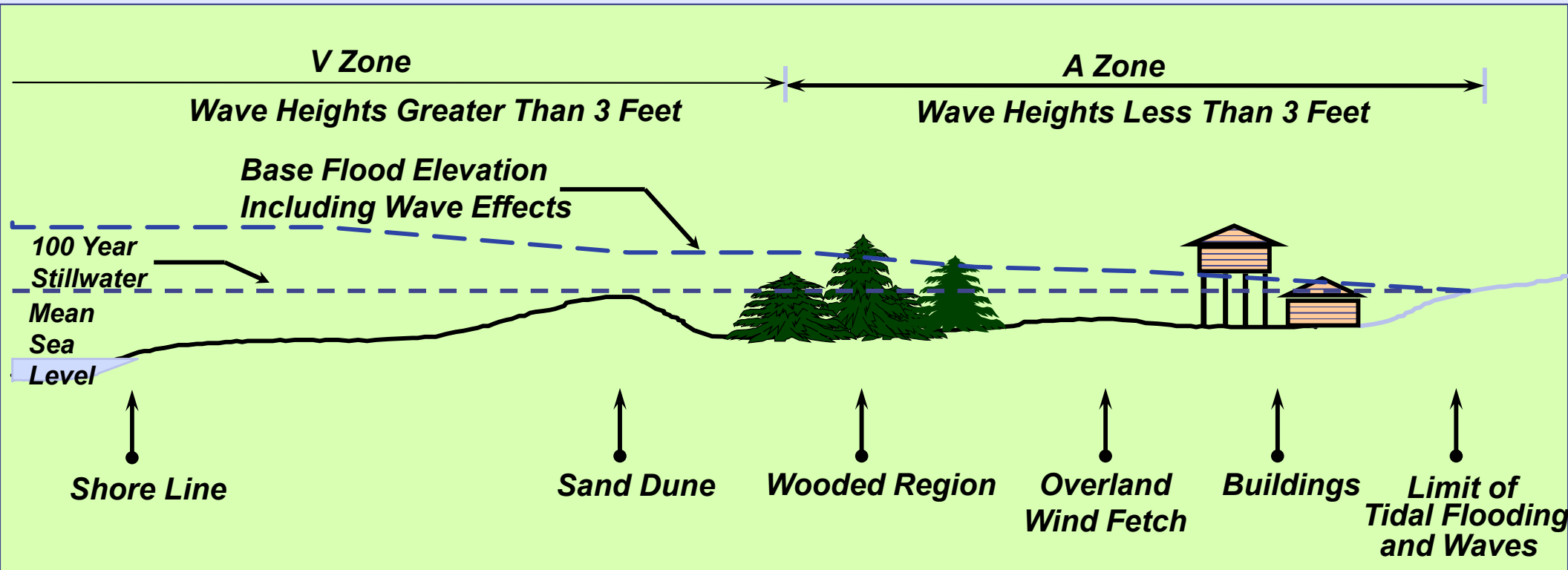
All new construction and substantial improvements shall have the space **below the lowest floor** free of obstructions or constructed with breakaway walls...

Such enclosed space shall not be used for human habitation and will be usable solely for parking vehicles, building access, or storage.





# Transect Schematic



After analyzing wave heights along each transect, wave elevations were interpolated between transects. Various source data were used in the interpolation, including topographic maps, beach profiles, aerial photos, and engineering judgment. Controlling features affecting the elevations were identified and considered in relation to their positions at a particular transect and their variation between transects.



# Breakaway Walls





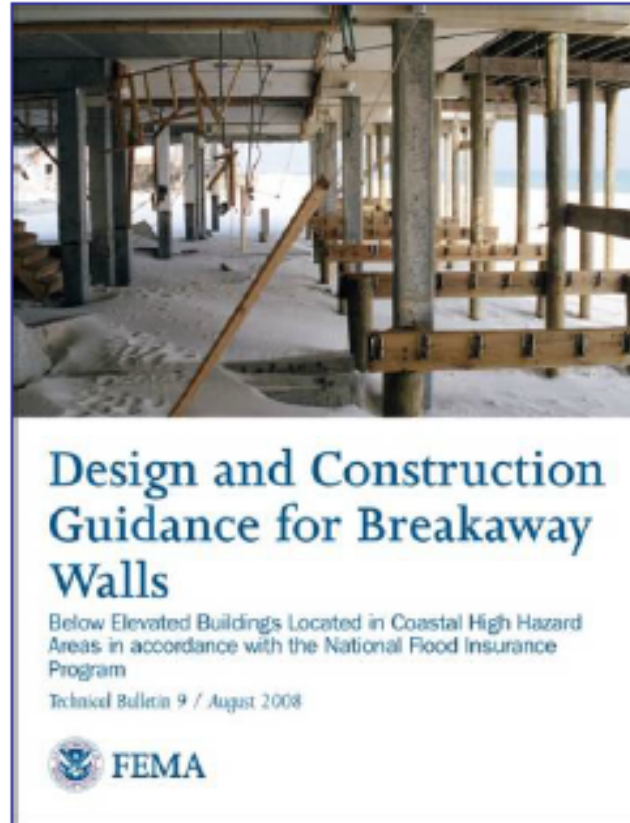
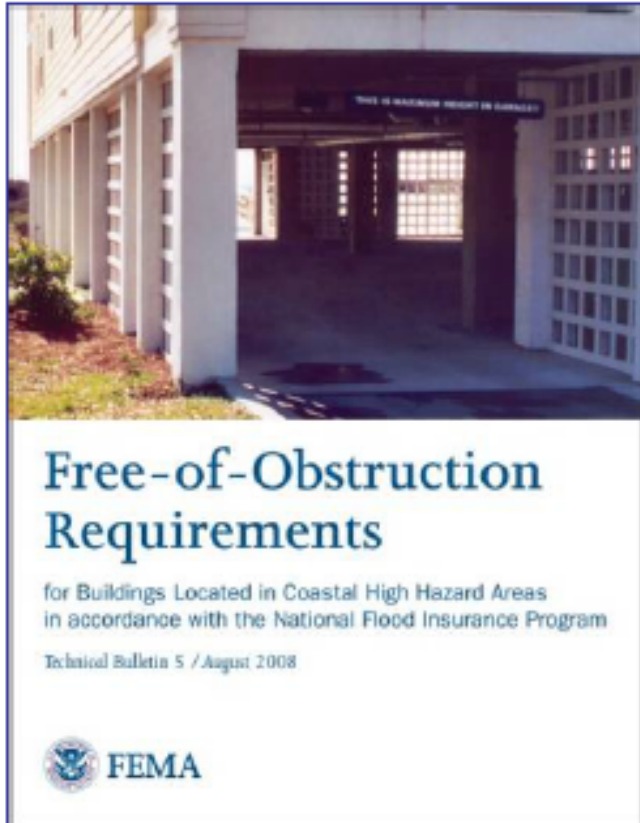








# Technical Bulletins



- Prescriptive and simplified breakaway wall designs
- Performance-based designs

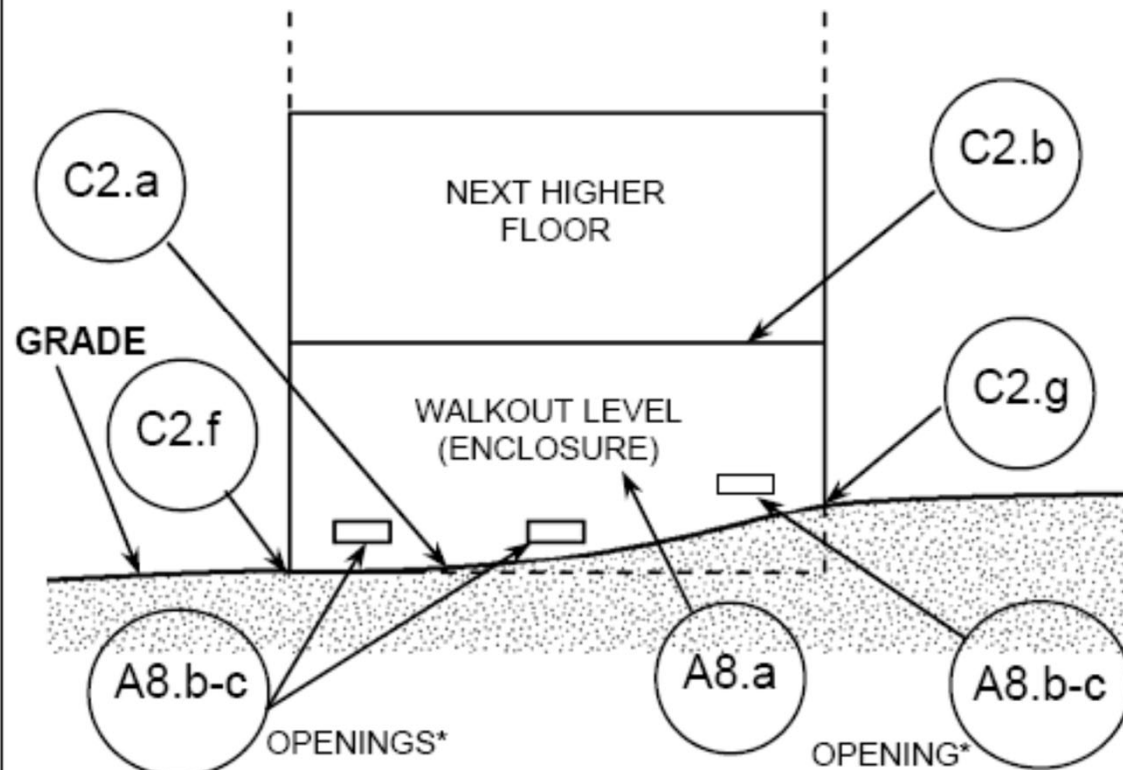


# Building Diagram 7

## DIAGRAM 7

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.

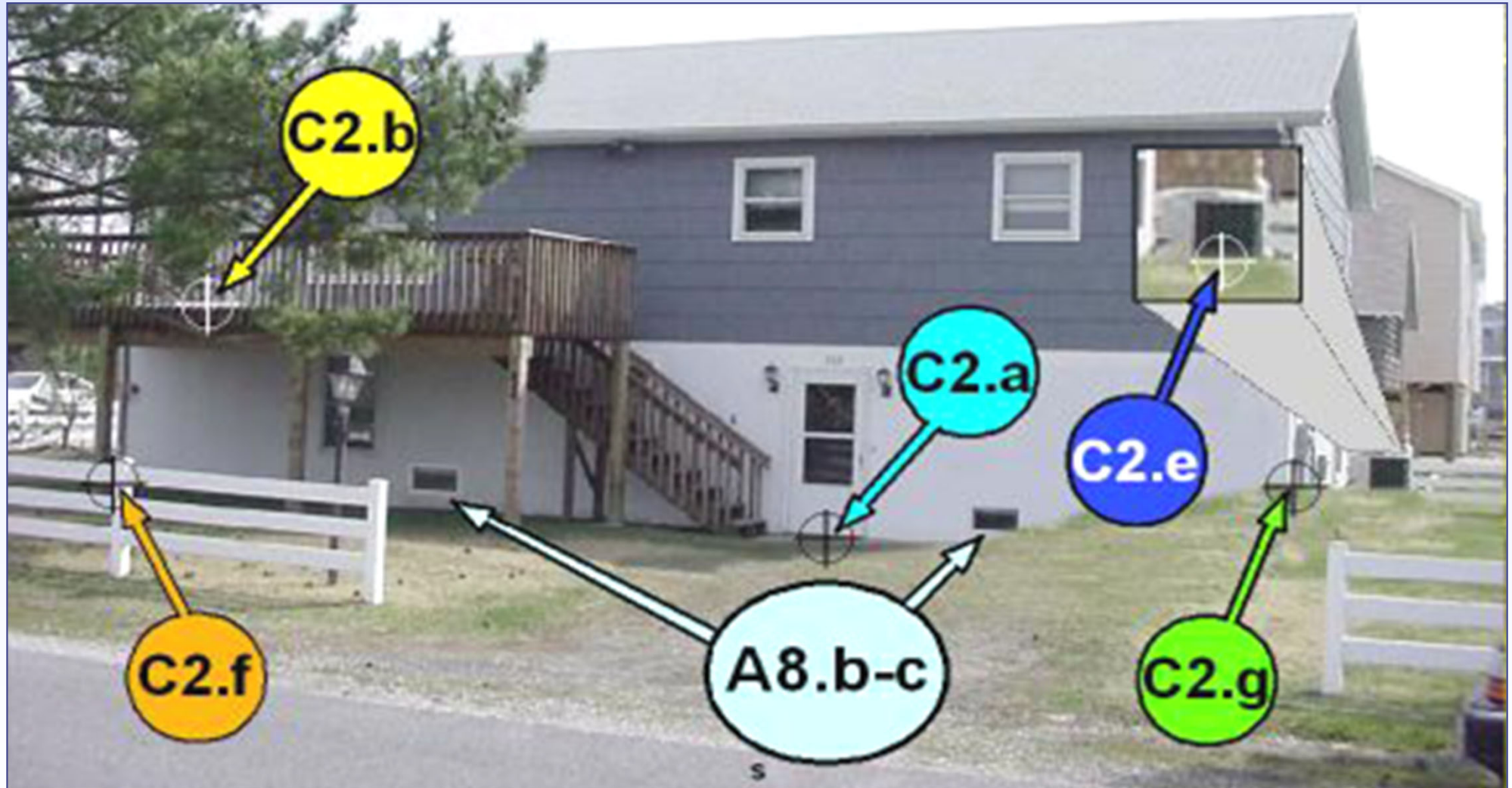
**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.





# Building elevated on full-story foundation walls

Fully enclosed area below the elevated floor





# Building elevated on full-story foundation walls

Fully enclosed area below the elevated floor



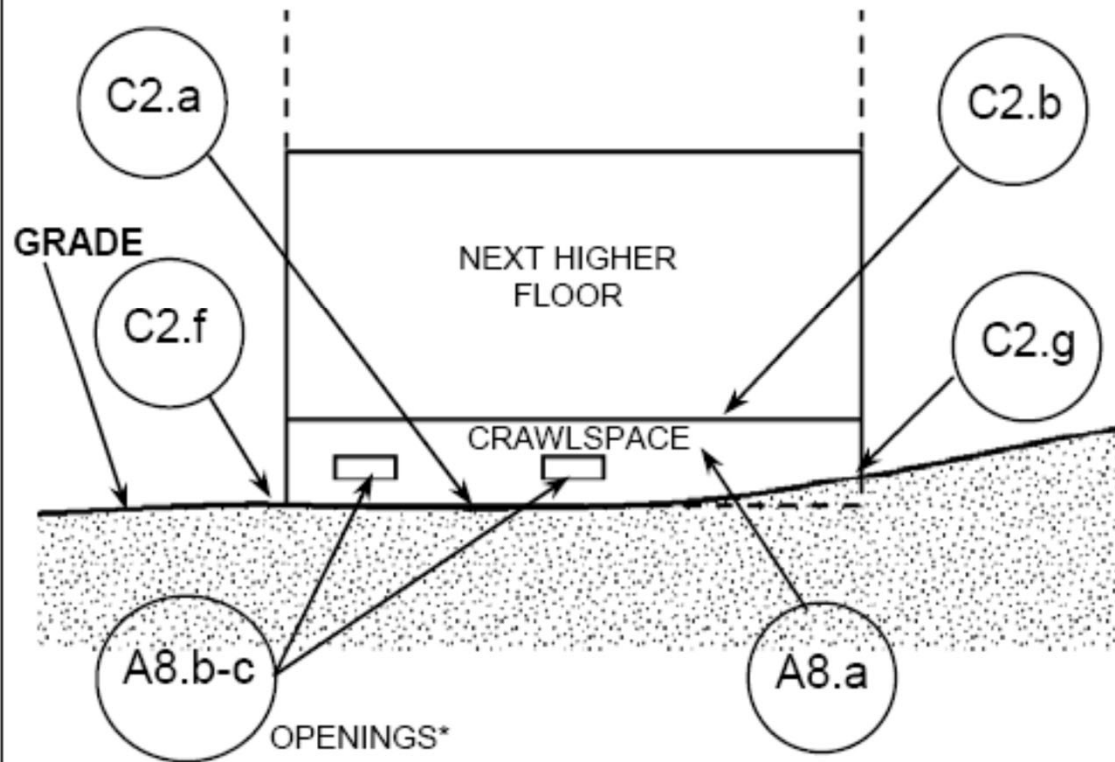


# Building Diagram 8

## DIAGRAM 8

All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least one side, with or without an attached garage.

**Distinguishing Feature** – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings\* present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.





# Multi-level building elevated on crawl space



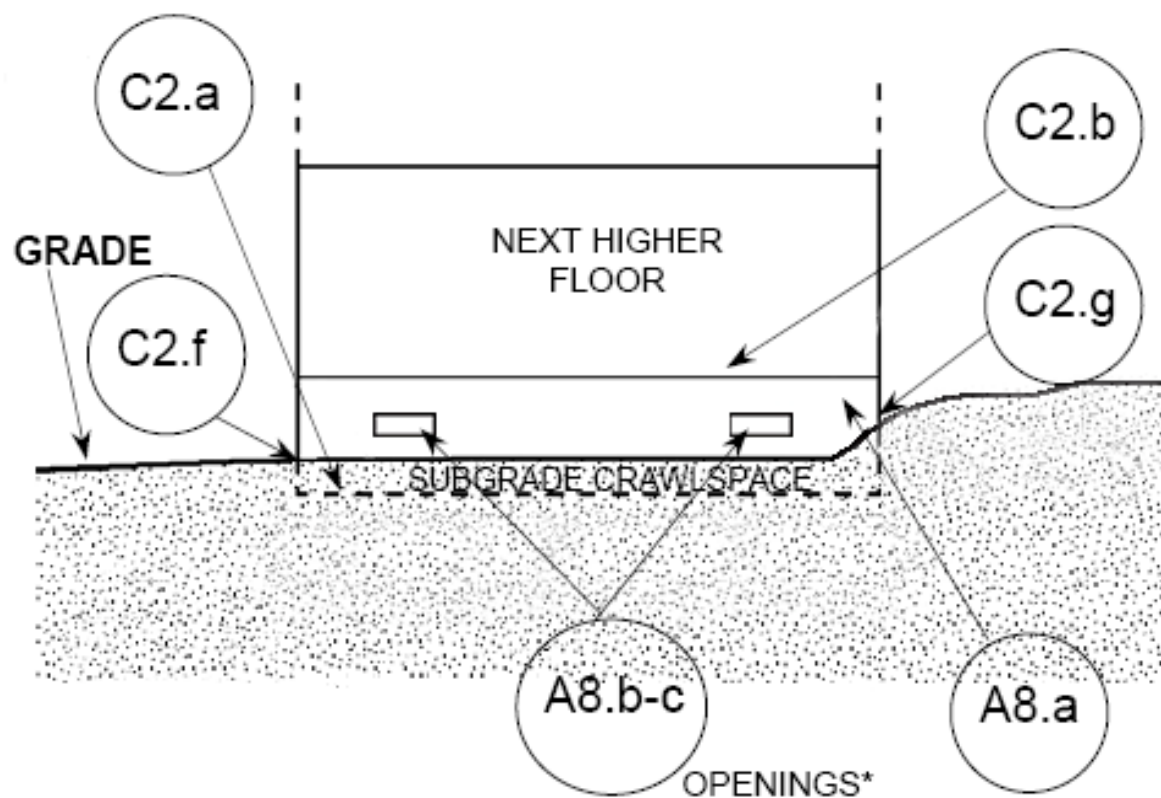


# Building Diagram 9

## DIAGRAM 9

All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.

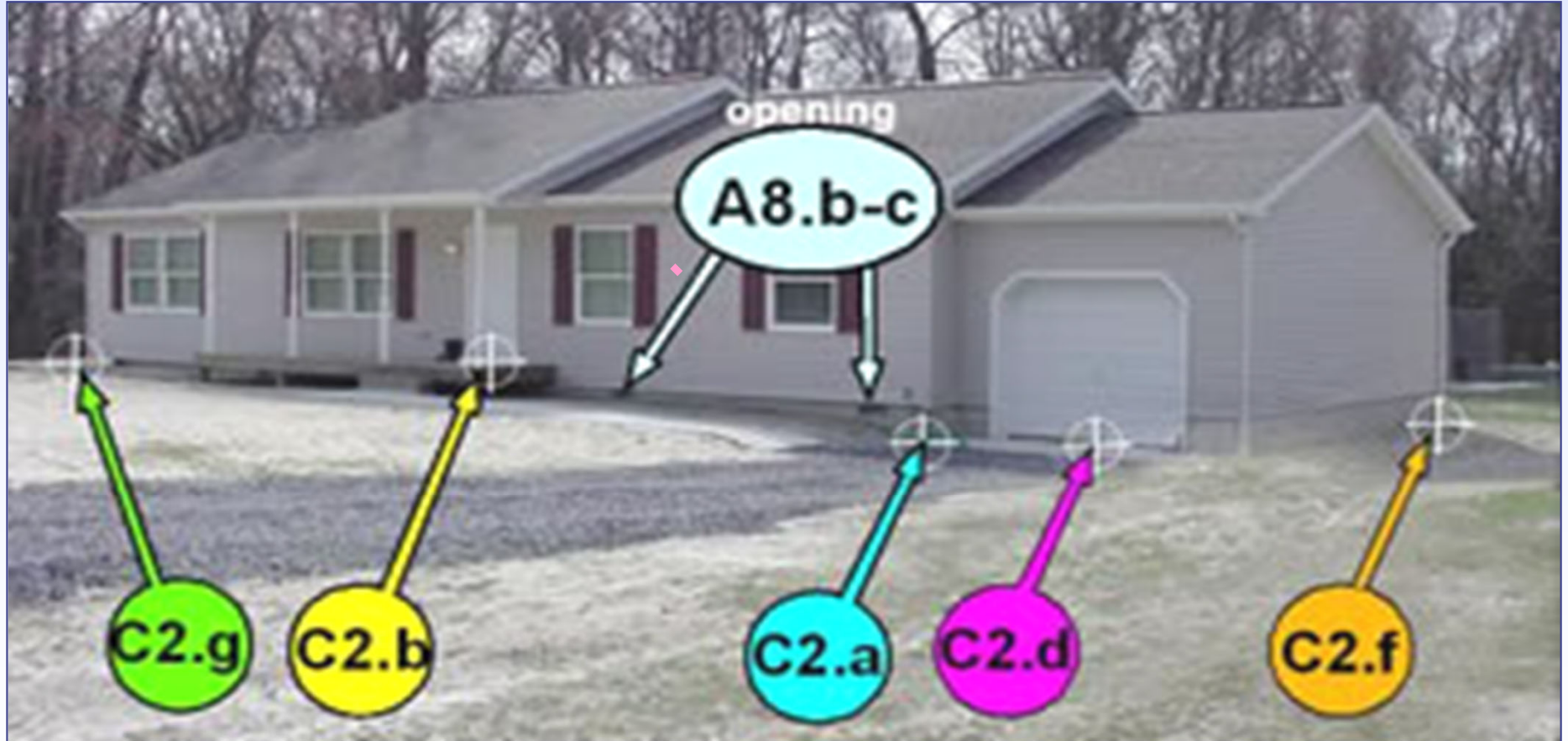
**Distinguishing Feature** – The bottom (crawlspace) floor is at or below ground level (grade) on all sides.\*\* (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, or the crawlspace floor is more than 2 feet below the grade (LAG) on all sides, use Diagram 2.)





# One-story building on crawl space

## Attached garage





# Which Diagram Do You Use?





# Which Diagram Do You Use?

#2

***Diagram 6***





# Which Diagram Do You Use?





# Which Diagram Do You Use?

#3





# Which Diagram Do You Use?

#4

*Diagram 4 or 2*





# Which Diagram Do you Use?

*Diagram 3 – Both garage and next floor are slab on grade.*





# Which Diagram Do You Use?

#5

## ***Diagram 5***





# Which Diagram is it?

*Diagram 5 - Hanging Floor*





# Which Diagram Do You Use?

#6

***Diagram 1A***





# Which Diagram Do You Use?

#7



**Diagram 1  
or 6?**





# Which Diagram Do You Use?

*Diagram 5 or 6*





# Which Diagram Do You Use?

#8





# Which Diagram Do You Use?

#9





# NFIP Contact Information

<https://flood.nc.gov/ncflood/ncfip.html>

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# Questions?

# Thank You!



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*North Carolina Geodetic Survey: Positioning NC today and for the future!*

# **Certified Floodplain Surveyor (CFS) Refresher Class**

April 29, 2021

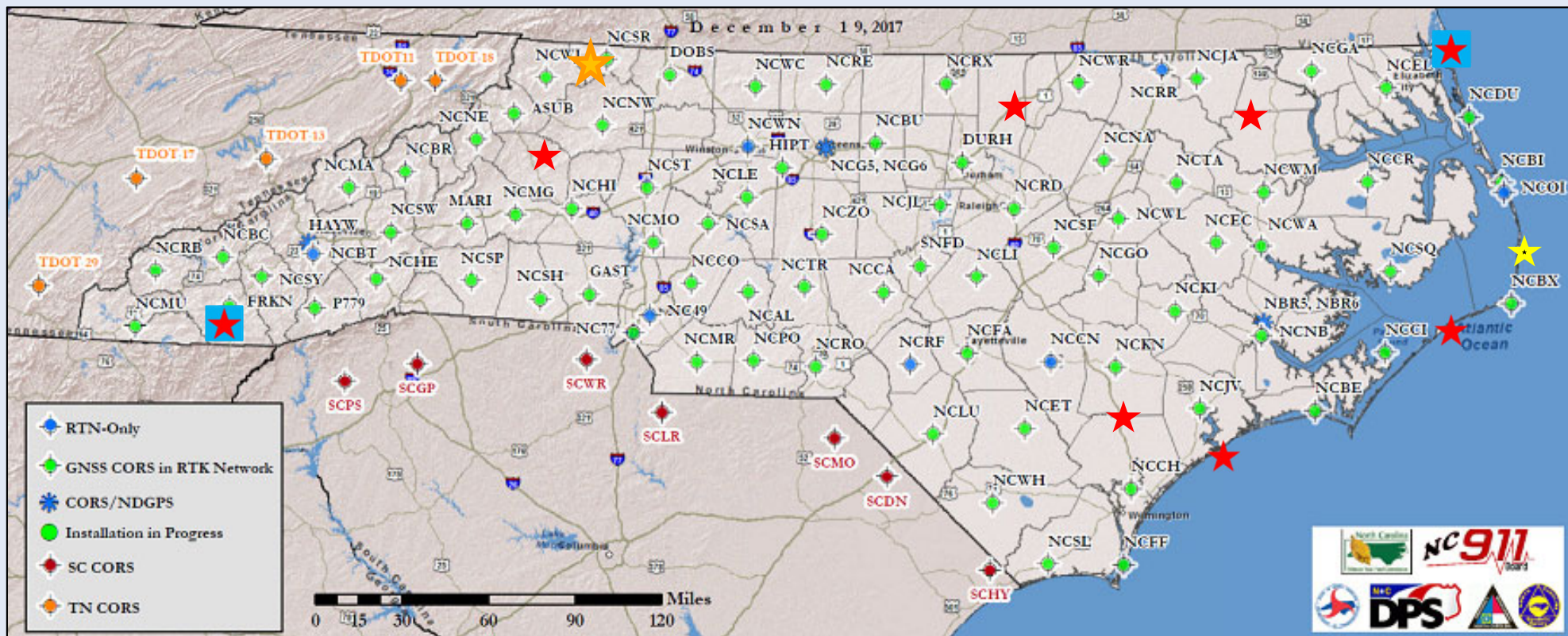


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# North Carolina (NC) Continuously Operating Reference Station (CORS) Network



Future CORS location = ★  
CORS installed = ★  
Earthquake CORS = ★  
Installation April 2022 = ★



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# NC CORS Network

---

- CORS to be upgraded in 2021-2022

- ~~Winston Salem (NCWN)~~
- ~~North Wilkesboro (NCNW)~~
- Mooresville (NCMO)
- Burlington (NCBU)
- Statesville (NCST)
- Sparta (NCSR)
- Boone (ASUB)



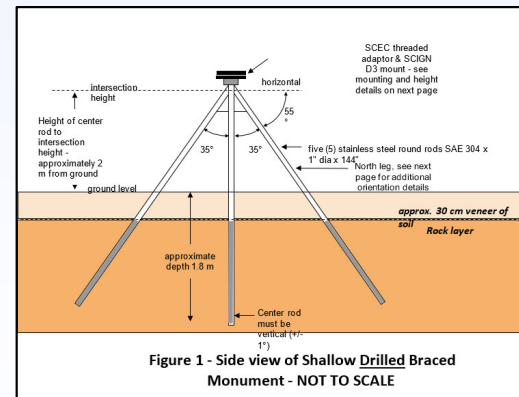
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# NC CORS Network

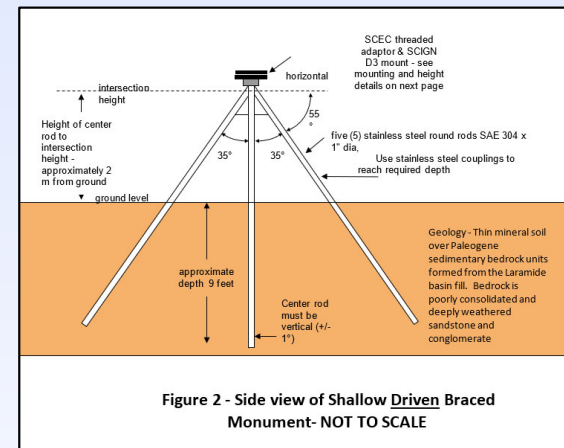
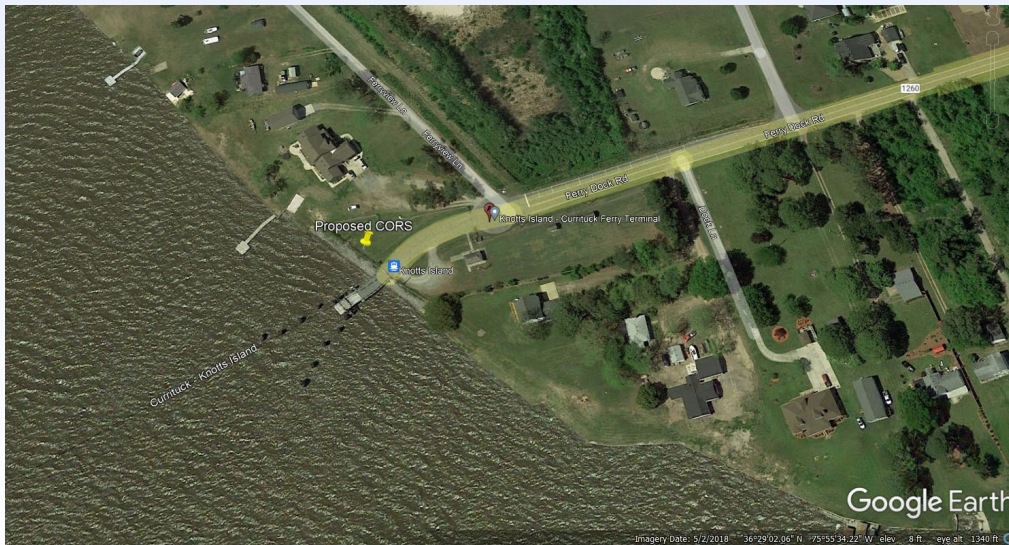
- New CORS to replace FRKN





# NC CORS Network

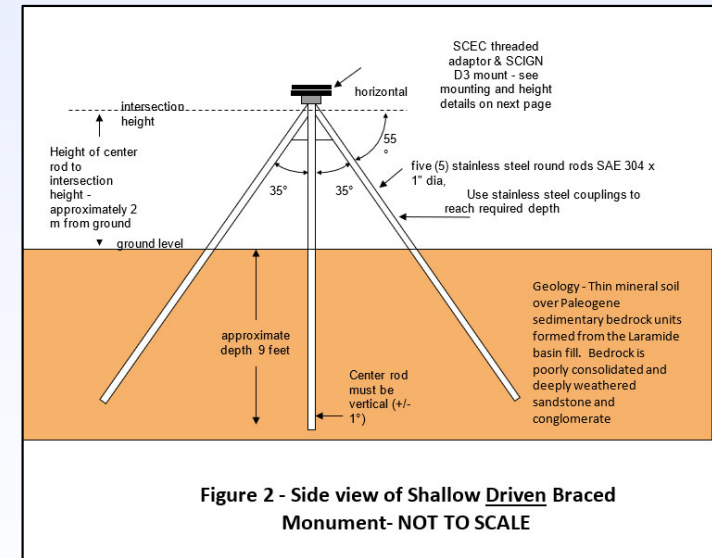
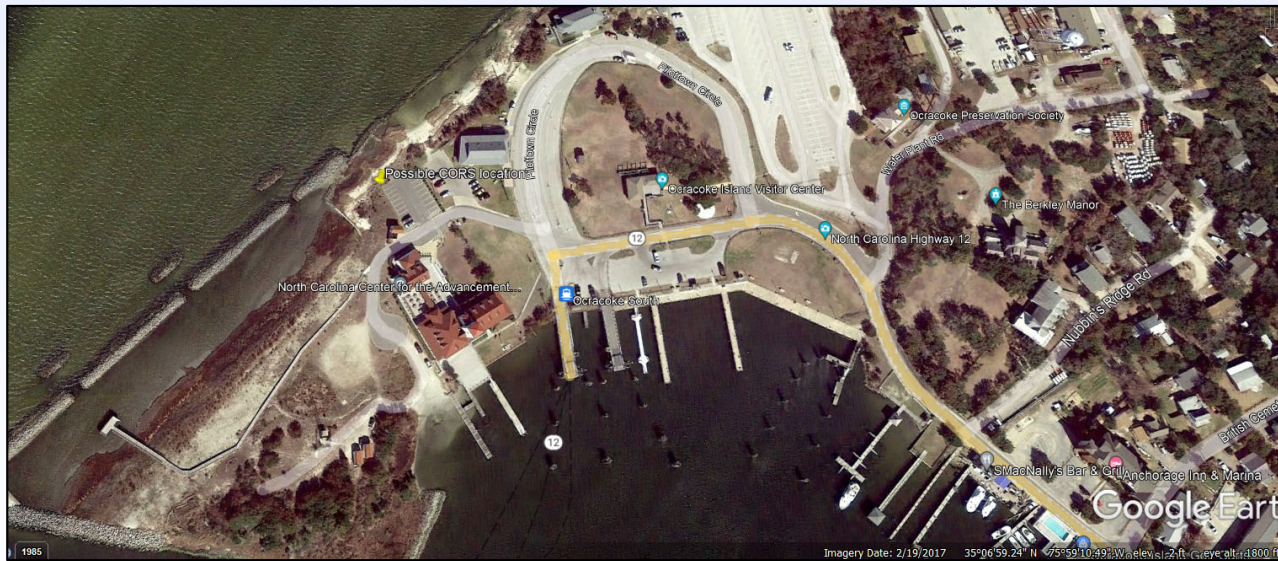
- Proposed CORS at Knotts Island





# NC CORS Network

- Proposed CORS on Ocracoke Island





# NC CORS Network

---

- Real-Time Network (RTN)
  - 96 CORS
    - 83 CORS in NC
    - 12 CORS from neighboring states
      - 7 CORS in South Carolina
      - 5 CORS in Tennessee
  - Capacity for 750 concurrent connected rovers
  - Galileo & BeiDou satellite data now included in NC RTN solution



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# NC CORS Network

---

- Real-Time Network (RTN)
  - 1960 Organizations
    - Engineering/Surveying/Mapping/Imaging: 45%
    - Construction/Grading/Paving/Mining/Dredging: 17%
    - Farming/Forestry: 29%
    - Government/Military: 7%
    - Education: 2%



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# OPUS-Projects 5.0

- Inclusion of previously processed GNSS vectors
  - Single-base Real Time Kinematic (RTK) vectors
  - Network RTK vectors
  - Vectors processed in other software

The screenshot shows the NOAA National Geodetic Survey website. At the top, the NOAA logo and name are displayed, along with the text "NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION" and "UNITED STATES DEPARTMENT OF COMMERCE". Below this, a banner reads "NGS Releases BETA OPUS Projects 5.0 — Now accepting RTK data!" and "NOAA's National Ocean Service sent this bulletin at 09/16/2021 11:24 AM EDT". The main heading is "National Geodetic Survey". Below this, a section titled "Test New Features in BETA OPUS Projects 5.0" contains text about uploading GNSS vectors and a "BETA" badge. A "Getting started:" section lists two bullet points: "Use sample data that are available online and in the GVX file format." and "Talk to your vendor about converting your own GNSS vector data to the GVX file format." Below this, a section titled "Learn More about OPUS Projects 5.0" includes a link to a webinar and a "View Recorded Webinar" button. A section titled "OPUS-Projects for RTK/RTN Vectors" describes the development of OPUS-Projects and includes a "Feedback" button. A "NGS Welcomes Your Feedback" section encourages users to provide feedback and includes a "Feedback" button. At the bottom, the website URL "geodesy.noaa.gov" and a link to "Manage Subscriptions" are displayed.

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
UNITED STATES DEPARTMENT OF COMMERCE

**NGS Releases BETA OPUS Projects 5.0 — Now accepting RTK data!**  
NOAA's National Ocean Service sent this bulletin at 09/16/2021 11:24 AM EDT

**National Geodetic Survey**

**Test New Features in  
BETA OPUS Projects 5.0**

Users can now upload GNSS vectors into OPUS projects, including vectors derived from either a single-base real-time kinematic (RTK) setup or from a real-time network (RTN), for evaluation, quality assessment, and inclusion in a GNSS survey network for least squares adjustment. Use the new GNSS Vector Exchange (GVX) file format to transfer data from various manufacturer hardware to OPUS Projects 5.0.

Getting started:

- Use [sample data](#) that are available online and in the GVX file format.
- Talk to your vendor about converting your own GNSS vector data to the GVX file format.

**Learn More about OPUS Projects 5.0**  
For an overview of the new features check out the recent [NGS webinar](#) from May 20, 2021.

**OPUS-Projects for RTK/RTN Vectors**  
NGS is developing OPUS-Projects so that GNSS vectors, including those from real-time kinematic (RTK) surveys, can be uploaded to a survey network for least-squares adjustment and submittal to NGS for publication. This has required developing a standardized GNSS vector exchange format known as GVX.

\*Technical Content Rating: Advanced - Prior knowledge of this topic is suggested.

**NGS Welcomes Your Feedback**  
NGS continually works to improve our services and releases beta versions of new or improved products for external testing and feedback. Please look for the new [Feedback](#) icon that appears on the right side of our OPUS pages. Click the icon to answer a short survey with your feedback, which will be used to make future improvements to OPUS. Or try uploading and working with GVX files in Beta OPUS Projects 5.0 and email your feedback to [ngs.feedback@noaa.gov](mailto:ngs.feedback@noaa.gov).

Send feedback on Beta OPUS Projects 5.0 at any time, by emailing [ngs.feedback@noaa.gov](mailto:ngs.feedback@noaa.gov).

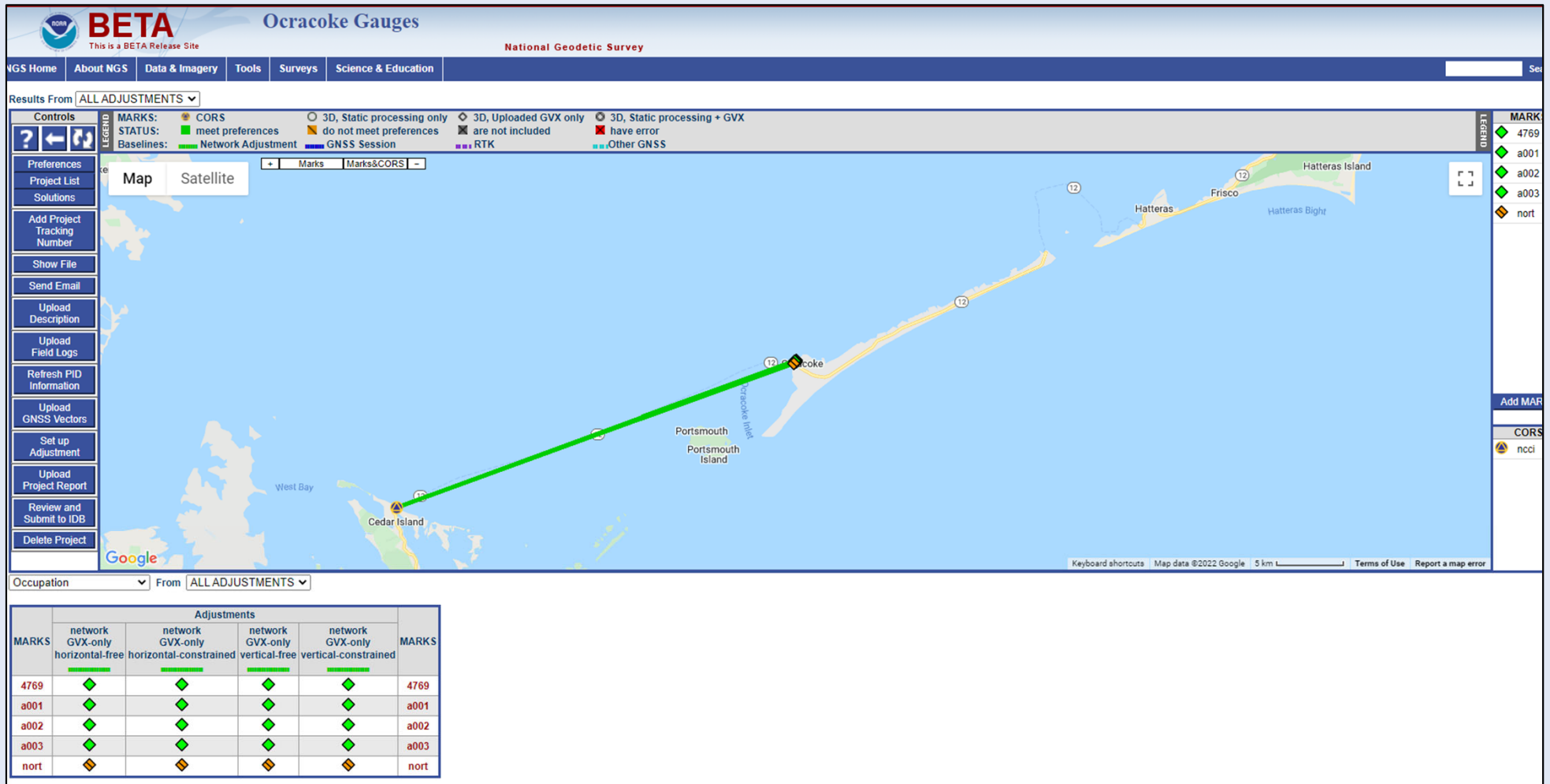
NOAA's National Geodetic Survey  
[geodesy.noaa.gov](https://geodesy.noaa.gov)

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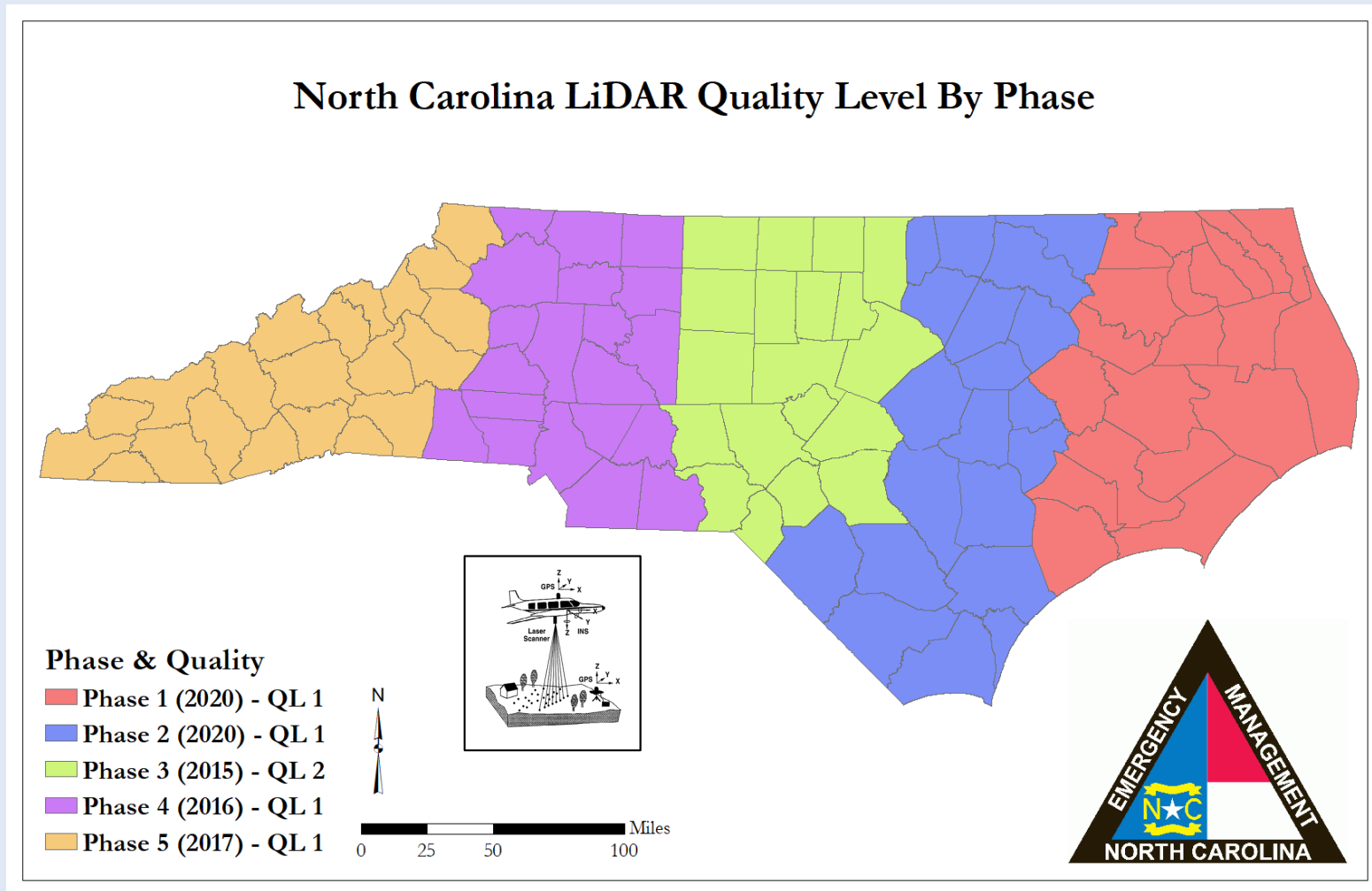


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# NC Light Detection and Ranging (LiDAR) Elevation Data



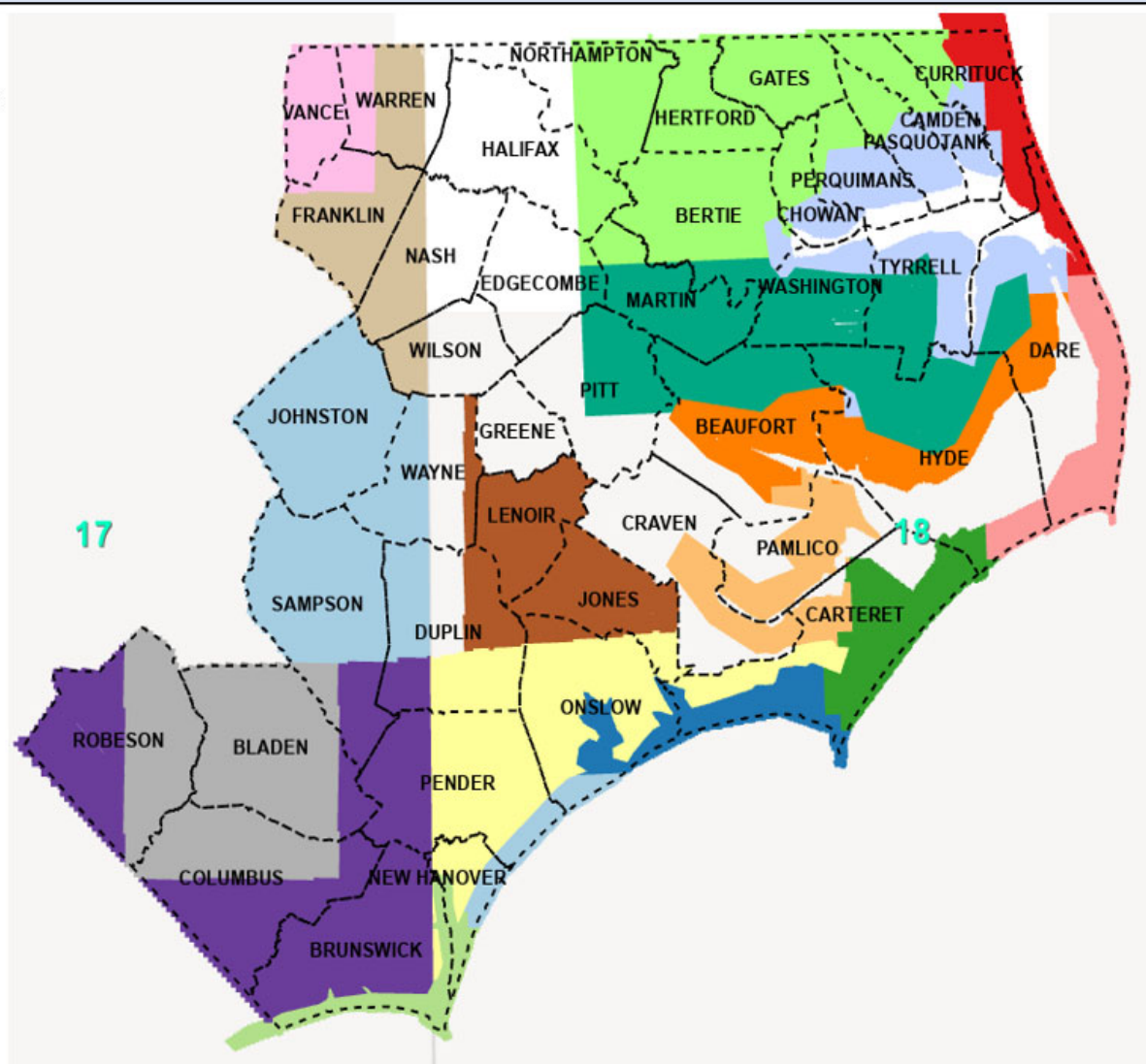


April 5th 2022 Status (Tiles received by NCDOT)  
 NOAA Topo/Bathy LiDAR and USGS LiDAR 8ppsm  
 Collected in the Dec 2019 to Feb 2020 time frame.

- D1\_NOAA
- D2\_NOAA
- D3\_NOAA
- D4\_NOAA
- D5\_NOAA
- D6\_NOAA
- D7\_NOAA
- D8\_NOAA
- D9\_NOAA
- b01\_USGS
- b02\_USGS
- b03\_USGS Bridge issue
- b04\_USGS
- b05\_USGS
- b06\_USGS
- b07\_USGS
- b08\_USGS
- b09\_USGS

New Additions  
 USGS block 5  
 USGS block 9

Note: USGS block 3 is missing the Bridges. USGS is investigating.

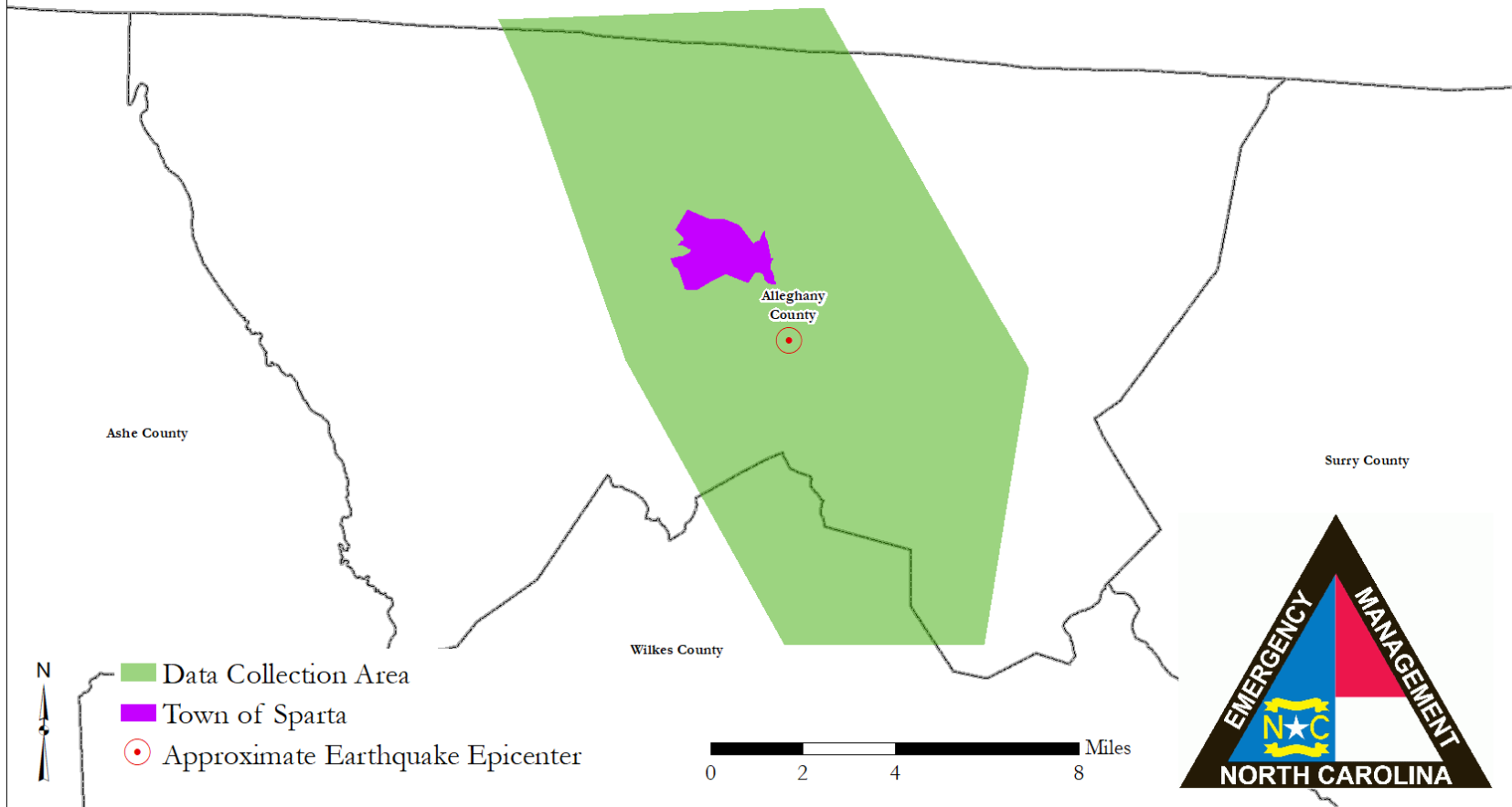


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## Sparta Earthquake LiDAR Data Collection

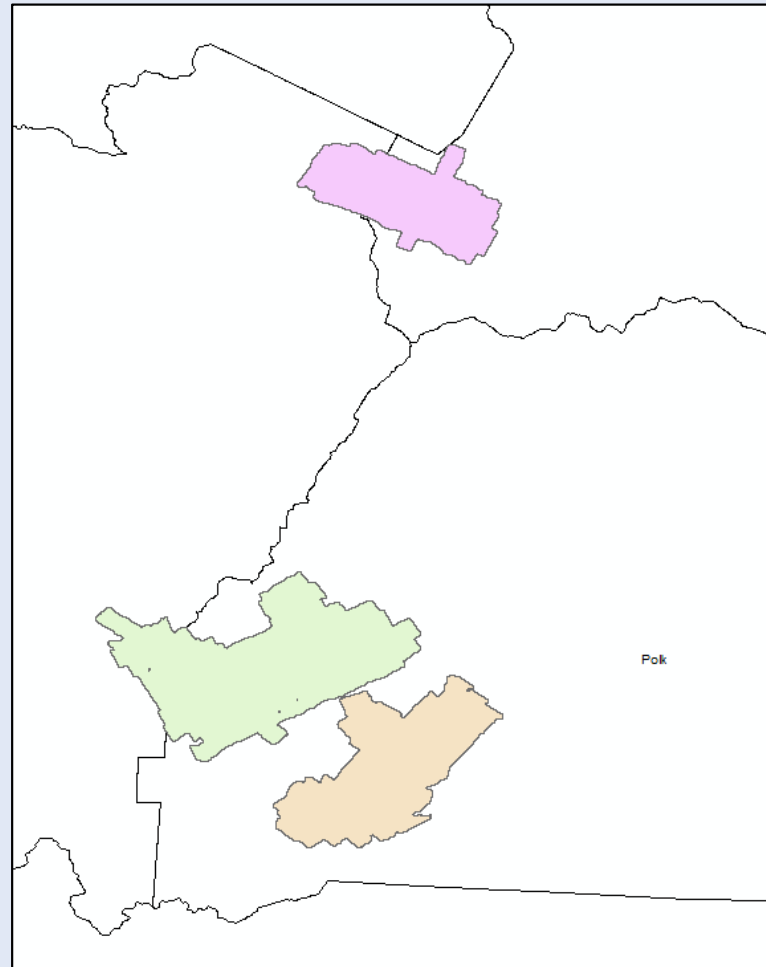


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# Landslide LiDAR Data Collection Area




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# LiDAR SPATIAL Data Download

**SPATIAL**  
Data Download

WELCOME TO NORTH CAROLINA'S SPATIAL DATA DOWNLOAD

Login below with your NCID


A North Carolina ID (NCID) is required.

Don't have a NCID? Sign up [here](#).

NCID USER NAME:

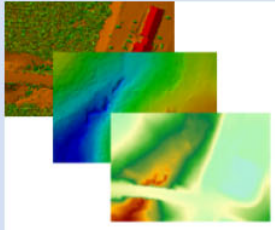
PASSWORD:

**LOGIN**




### Hazards

Information provided with Floodplain Mapping.



### Base Data

- Quality Level 2 LiDAR
- Legacy LiDAR
- Digital Elevation Models

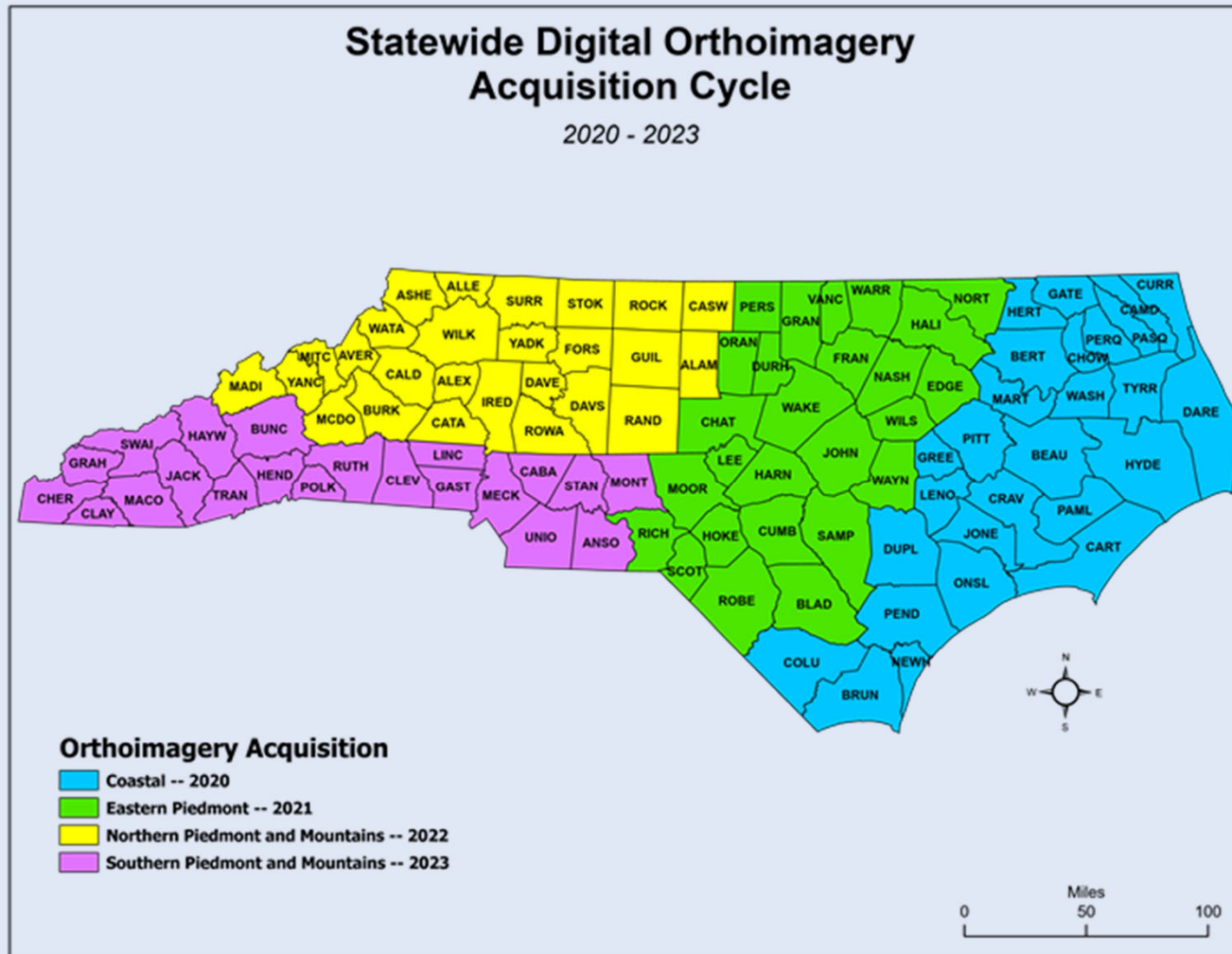


### Built Environment

Data on structures and other built environments.



# Statewide Imagery







## 2021 Imagery Now Available

Learn [about 4-band imagery](#) or get [detailed information](#) about any of the imagery products.

### Overview

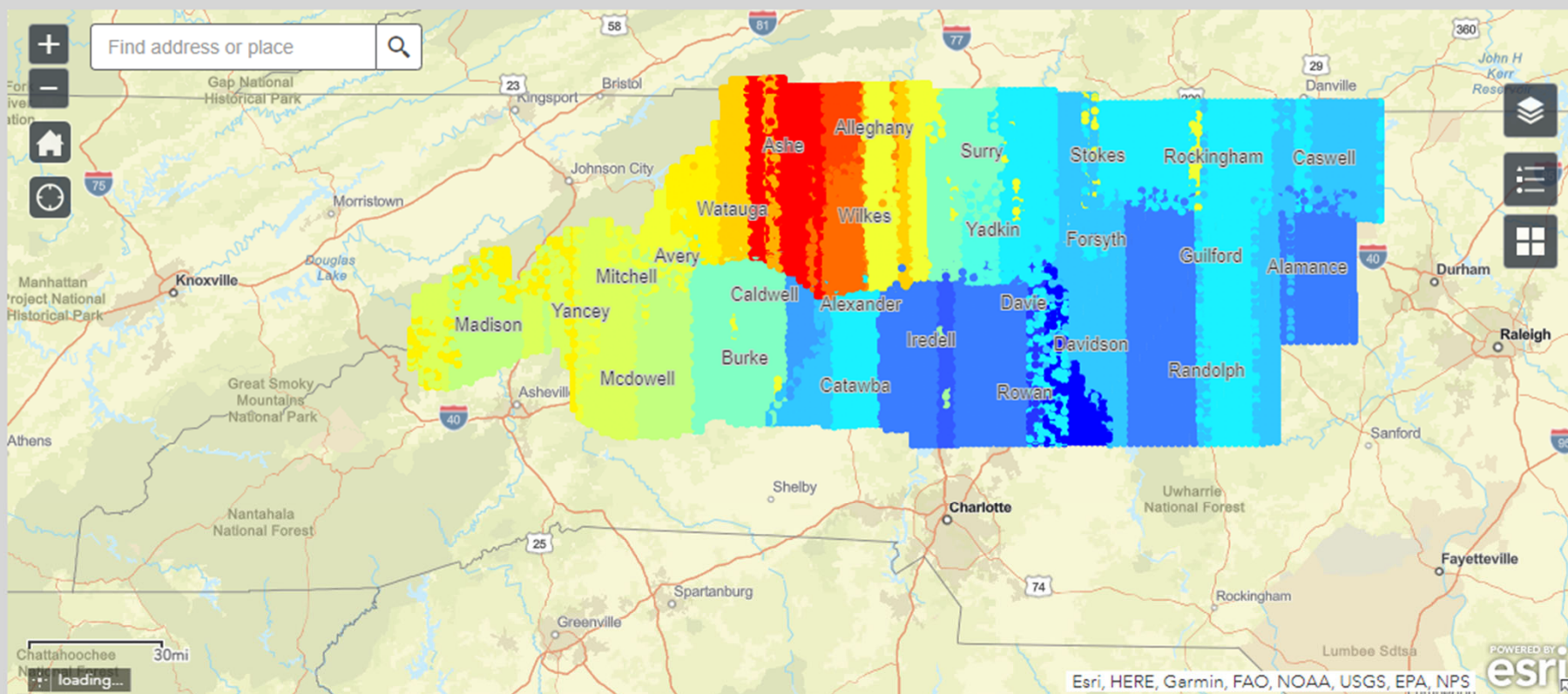
The NC Orthoimagery Program collects and produces 6-inch (15cm) orthoimagery on a 4-year cycle. Approximately a quarter of the state is flown each year to develop streaming imagery services, 5,000' by 5,000' tiles, and compressed single-file county mosaics. Beginning in 2020, the state started collecting a [fourth band of imagery](#), which, when combined with the other 3 bands of red, green, and blue, will open up new possibilities for exploration and analysis. [Get more information about the program...](#)





## Project Status

Zoom into the current project area to see the exact dates that imagery was flown. Future project areas are also outlined.




\*\*Future projects are dependent on funding availability.





# New Datums are Coming in ~~2022~~ (2024-2025)




## National Geodetic Survey

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### New Datums

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- [Industry Engagement](#)
- [2019 Summit](#)
- [2017 Summit](#)
- [2015 Summit](#)
- [2010 Summit](#)

### Delayed Release of the Modernized NSRS

NOAA's National Geodetic Survey (NGS) is announcing a delay in the release of the modernized National Spatial Reference System (NSRS).

In 2007, NGS began planning for the modernized NSRS, acquiring its first airborne gravimeter, creating and initiating the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project and by 2008 had codified its modernization plans into a Ten Year Plan. At that time, the target completion date was 2018. By 2013, that date seemed unlikely, due to both the broadening of the GRAV-D coverage area and the experience of five years of operational planning and execution.

In 2013, NGS revised its 2008 Plan, and targeted 2022 as the date of the release of the modernized NSRS. This date was reinforced with a 2018 Strategic Plan revision. By 2017, confidence in hitting the 2022 target was high enough to reach final agreement with Canada and Mexico on a naming convention for certain components, to include "2022" in their names.

Since 2017, operational, workforce, and other issues have arisen and compounded, causing NGS to recently re-evaluate whether a successful roll-out by 2022 is possible. The most significant impacts have been in workforce hiring and retention, and in meeting GRAV-D data collection milestones, which underpin the NSRS modernization efforts.

NGS is currently conducting a comprehensive analysis of ongoing projects, programs, and resources required to complete NSRS modernization and will continue to provide regular updates on our progress. To get the latest news on NSRS modernization and track our progress, subscribe to **NGS News** or visit our **"New Datums" web pages**.

Further details, and more answers are available on this [FAQ](#)

Website Owner: National Geodetic Survey / Last modified by NGS Infocenter Jun 22 2020

[NOS Home](#) | [NGS Employees](#) | [Privacy Policy](#) | [Disclaimer](#) | [USA.gov](#) | [Ready.gov](#) | [Site Map](#) | [Contact Webmaster](#)



# What's Being Replaced?

## Horizontal

- **NAD 83(2011)**
- NAD 83(PA11)
- NAD 83(MA11)

Latitude

Longitude

Ellipsoid Height

State Plane Coordinates

## Vertical

- **NAVD 88**
- PRVD 02
- VIVD09
- ASVD02
- NMVD03
- GUV D04
- IGLD 85

Heights



# New Reference Frame Names

North American Datum of 1983 (NAD83) becomes:

- North American Terrestrial Reference Frame (NATRF2022)
- Caribbean Terrestrial Reference Frame (CATRF2022)
- Mariana Terrestrial Reference Frame (MATRF2022)
- Pacific Terrestrial Reference Frame (PATRF2022)

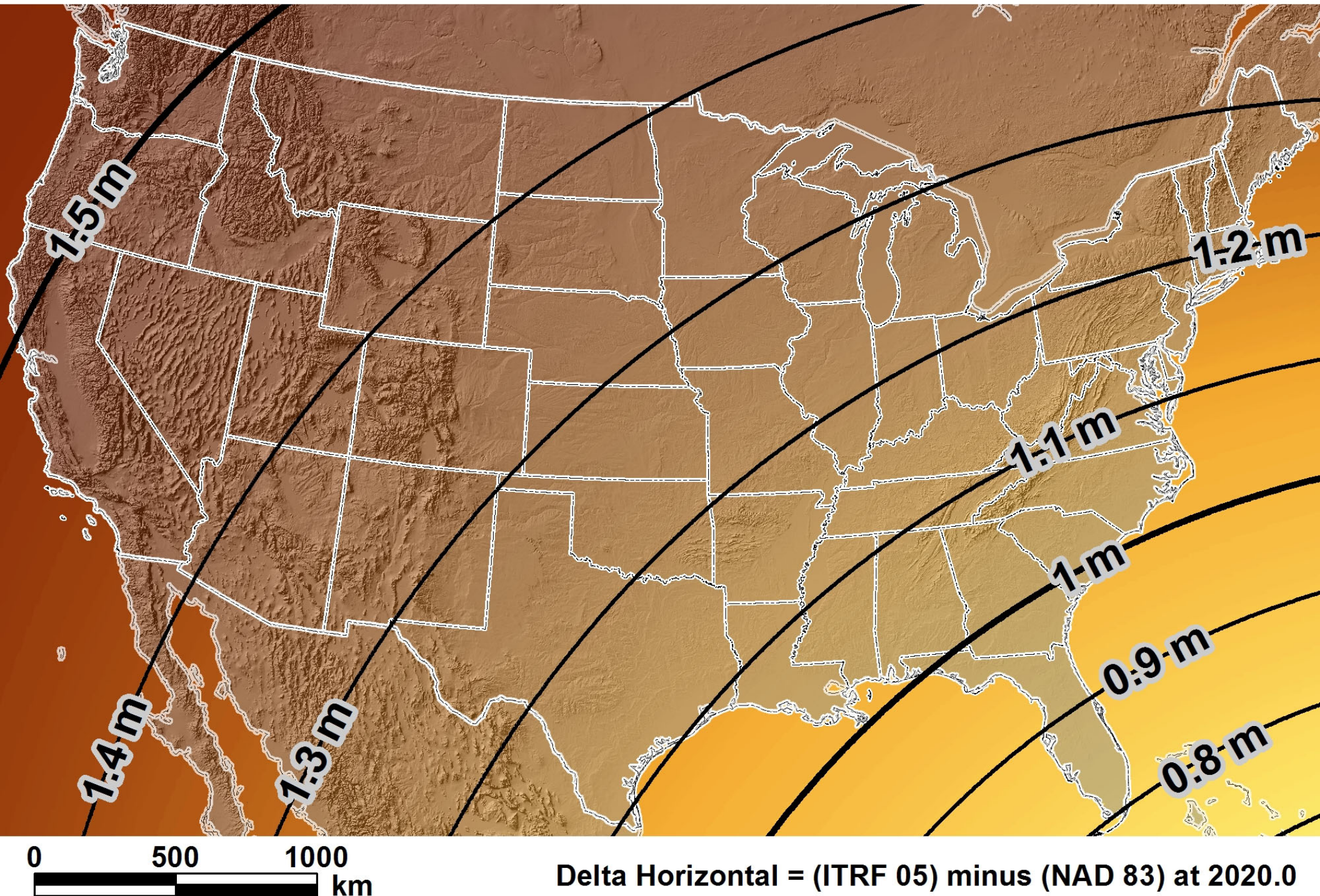
North American Vertical Datum of 1988 (NAVD88) becomes:

- North American-Pacific Geopotential Datum of 2022  
(NAPGD2022)

(Realized by GEOID2022)

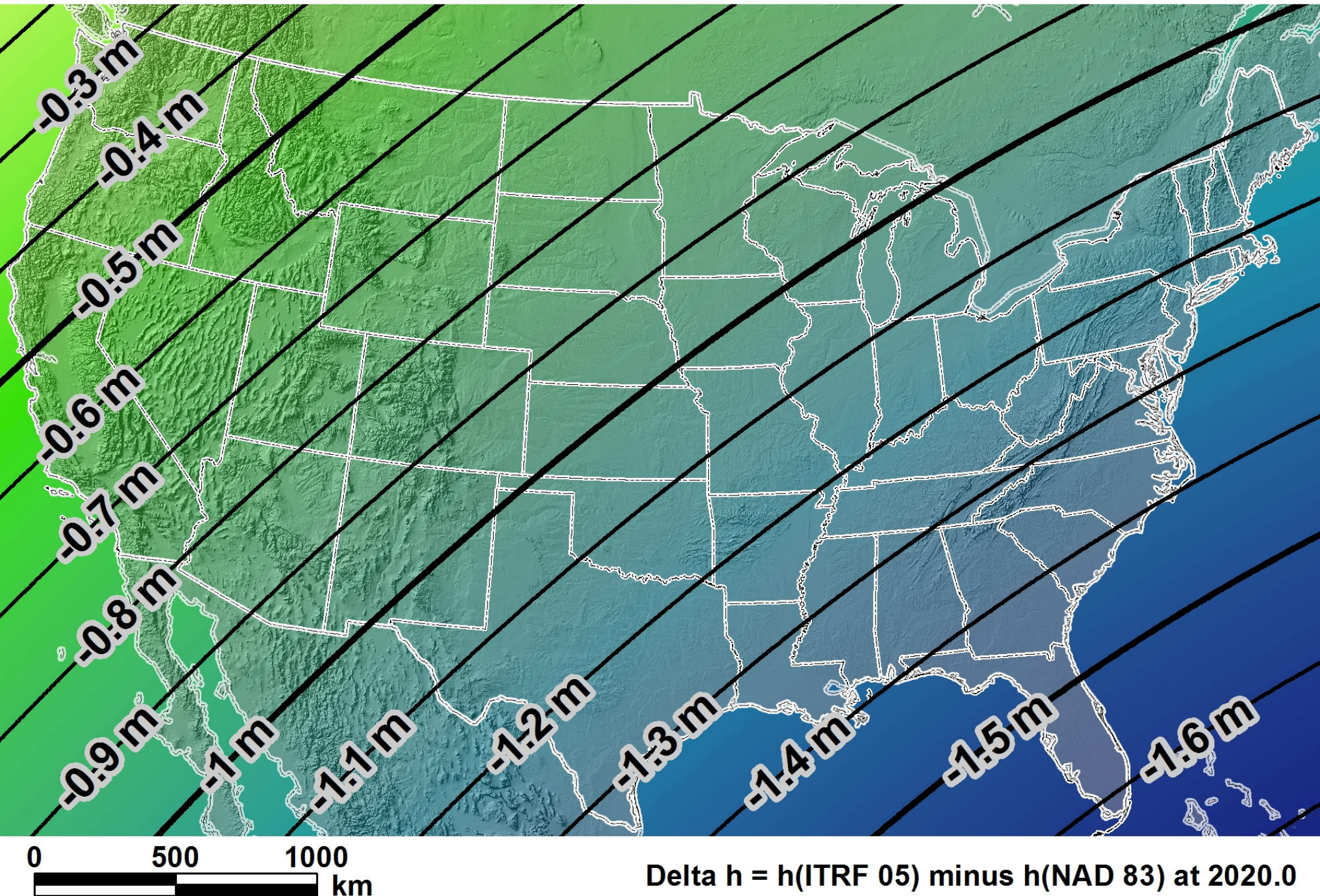


# Estimated horizontal change from NAD 83 to new geometric datum



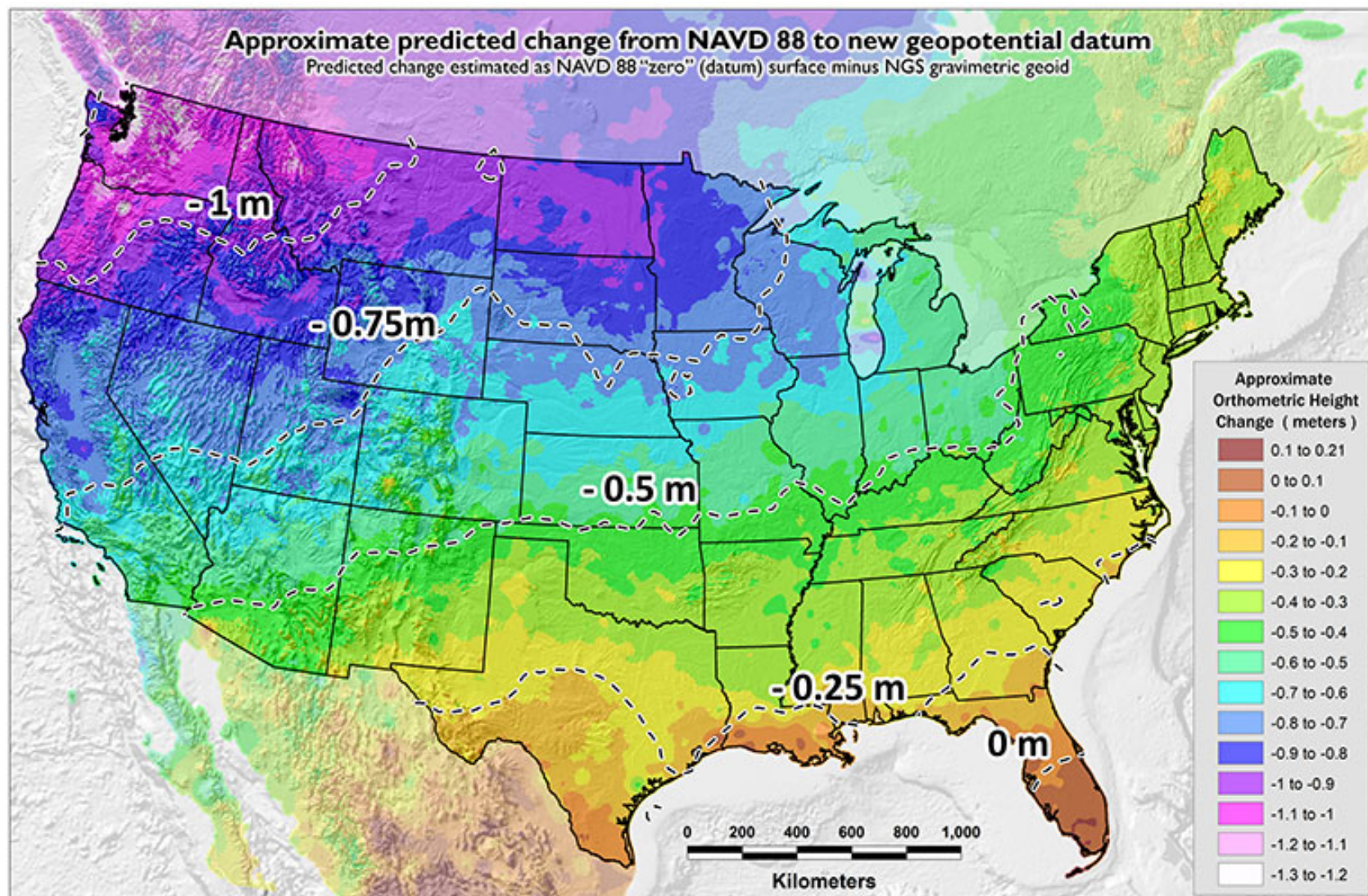


# Estimated ellipsoid height change from NAD 83 to new geometric datum





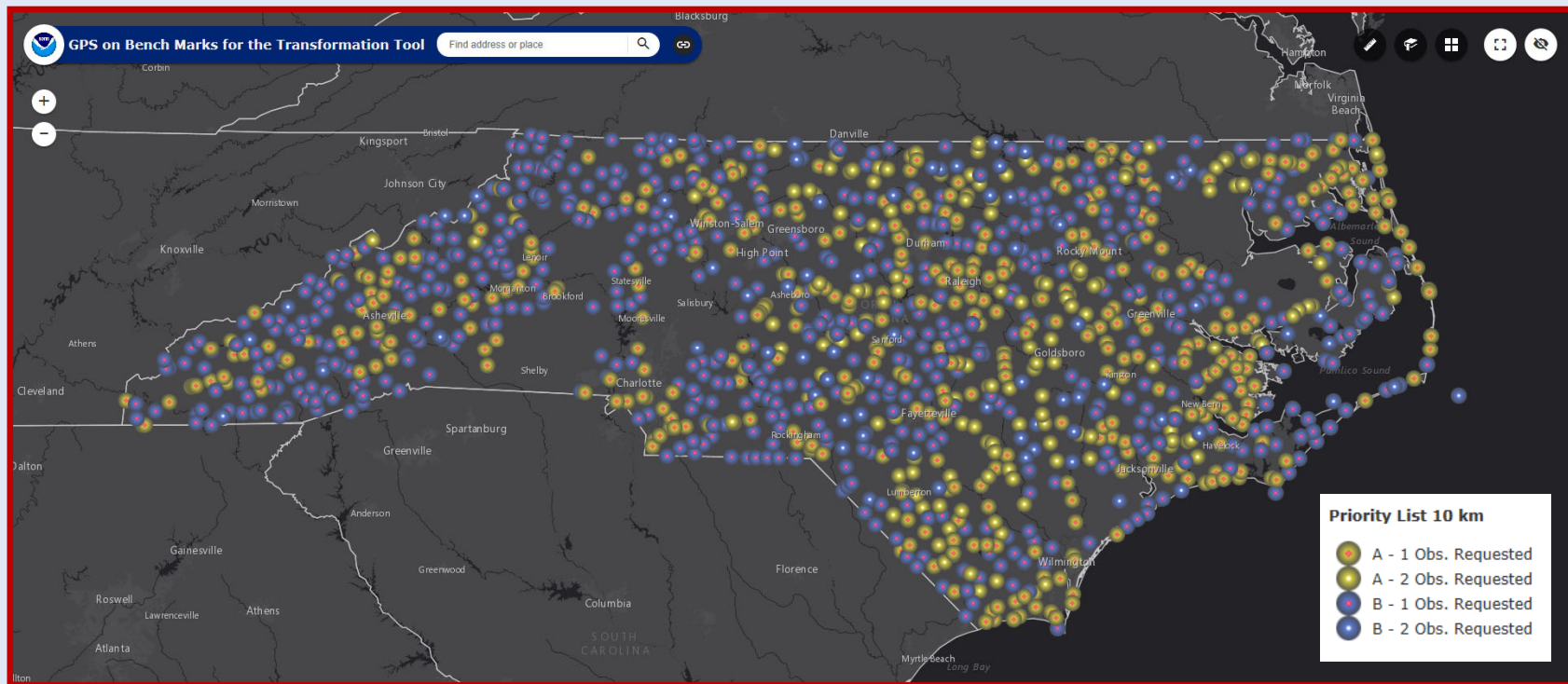
# New Vertical Datum





# National Geodetic Survey GPS on Bench Marks 2020/2021

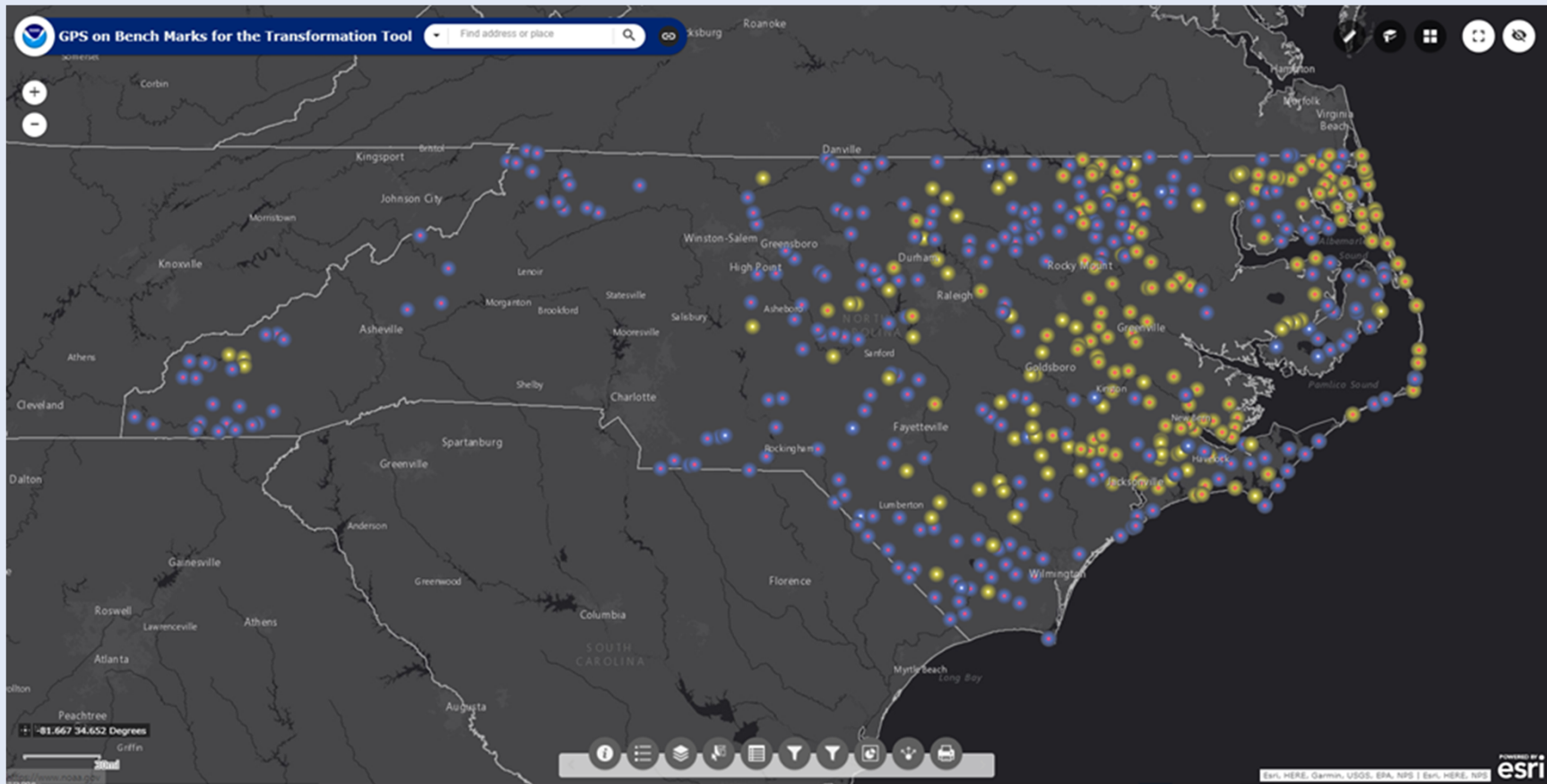
- 2020
  - NGS has prepared a list of geodetic monuments that we review for possible GNSS data collection





# National Geodetic Survey GPS on Bench Marks 2020/2021

- 2021 (status as of 3/31/2022)



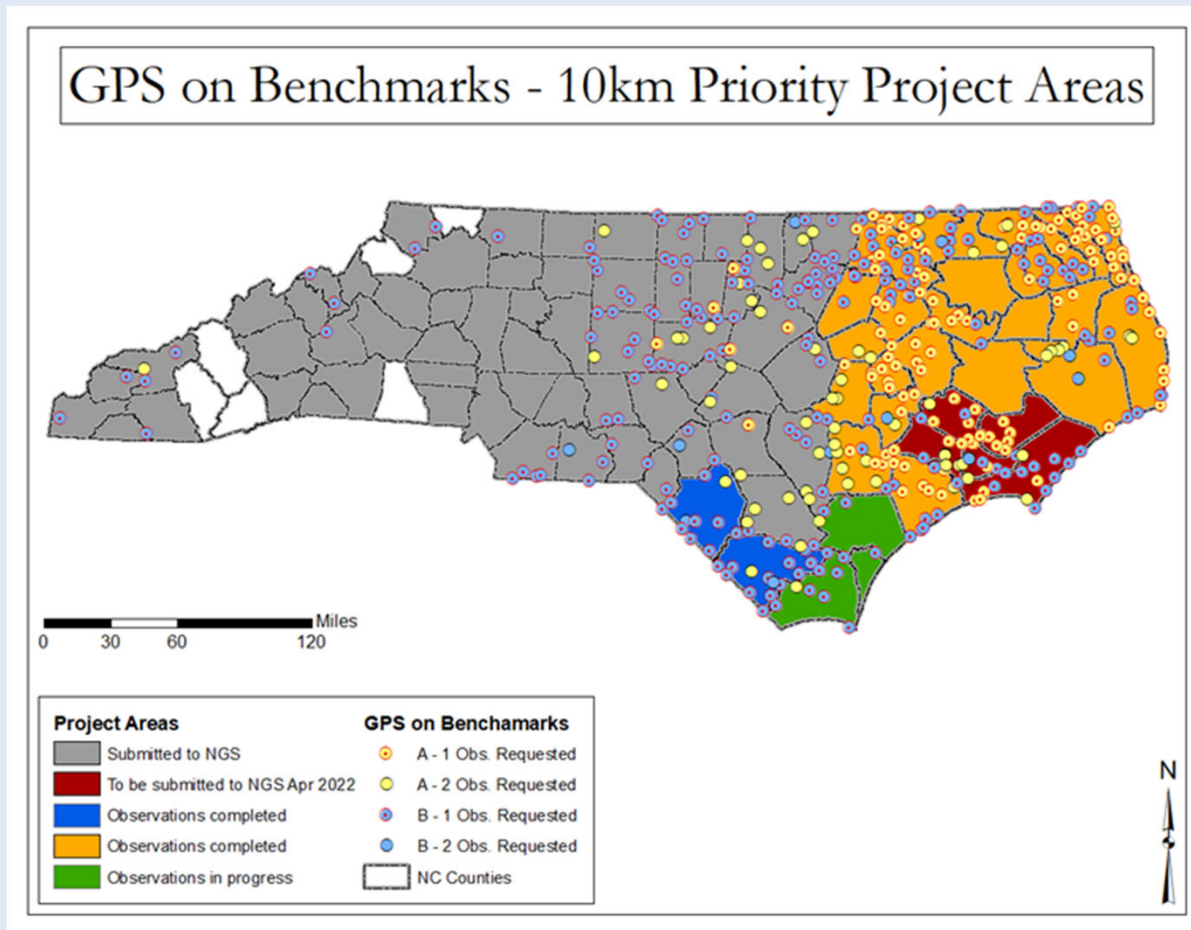
**North Carolina Emergency Management**





# National Geodetic Survey GPS on Bench Marks 2020/2021

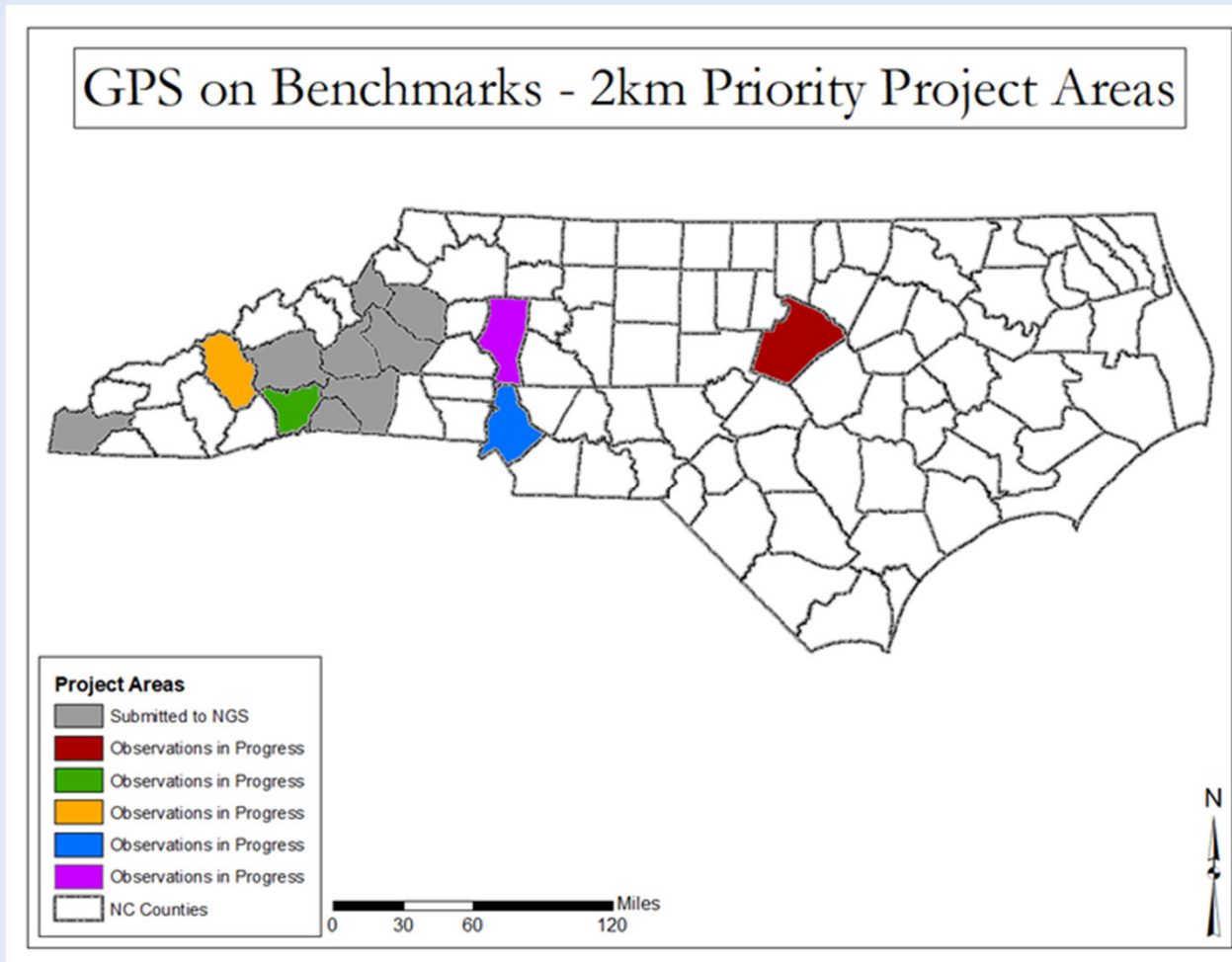
- Projects in progress





# National Geodetic Survey GPS on Bench Marks 2020/2021

- Projects in progress

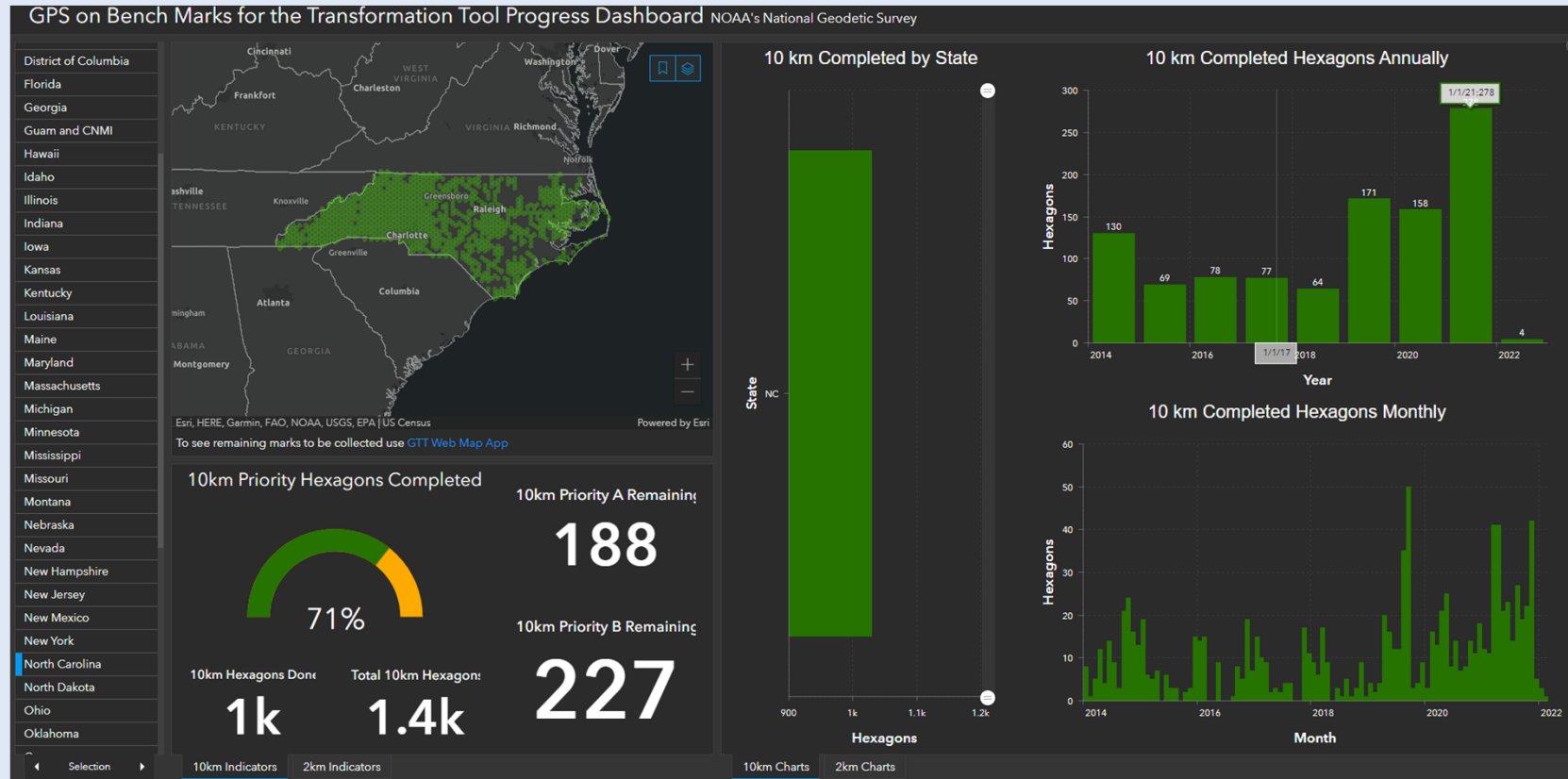


**North Carolina Emergency Management**





# North Carolina's Progress Dashboard



## GPS on BenchMarks

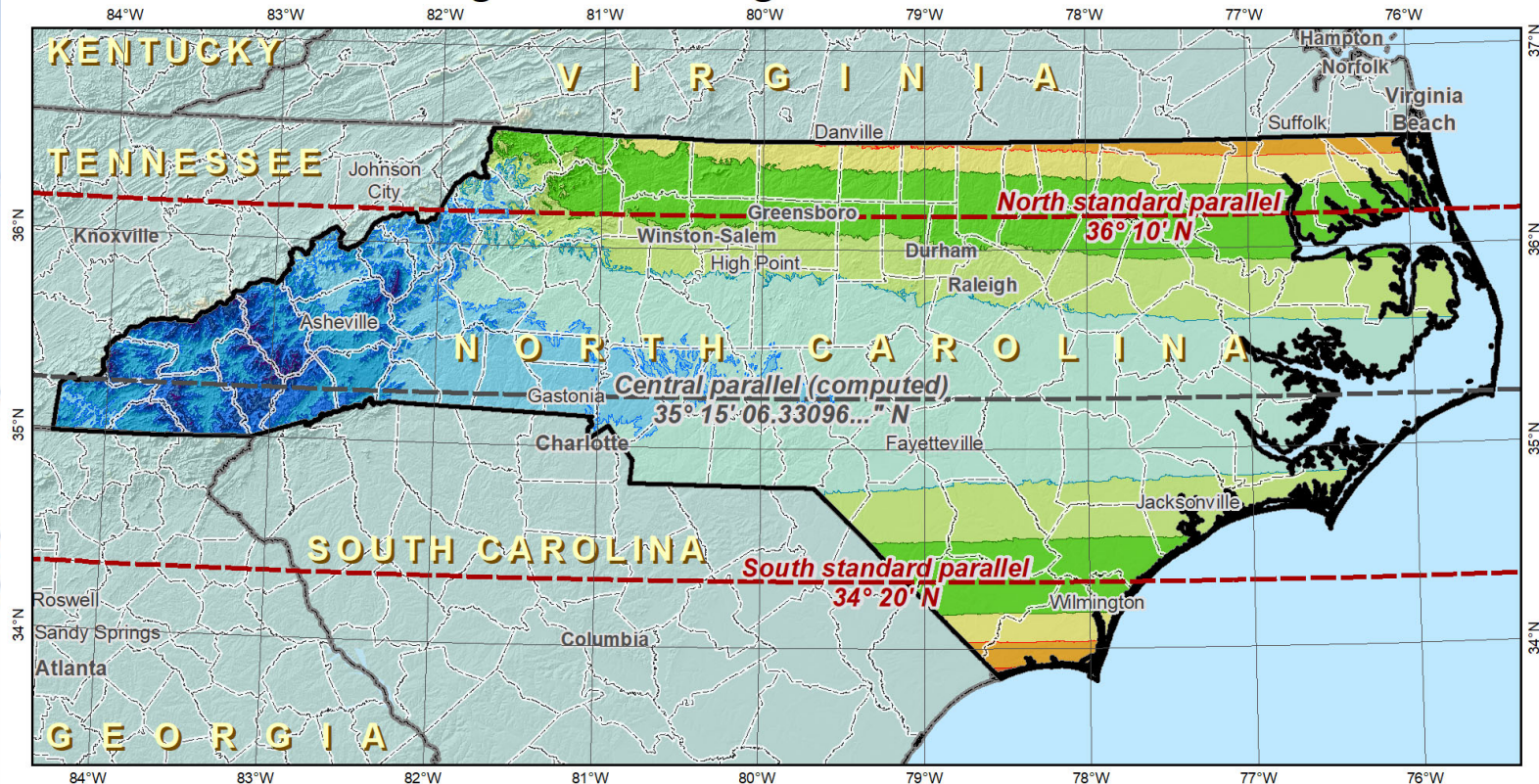
\*\*\* NOTICE: NGS has extended the December 31, 2021 cut-off date for GPS on Bench Mark submissions! The new cut-off date to submit GPS on Bench Mark data for use in the 2022 Transformation Tool is now December, 31, 2022. \*\*\*



North Carolina Emergency Management





**Existing SPCS 83 design: North Carolina Zone****Lambert Conformal Conic projection**

North American Datum of 1983

**Central parallel:** 35° 15' 06.3... " N**Cen parallel scale:** 0.999 872 592...**Areas within  $\pm 100$  ppm distortion ( $\pm 0.53$  ft per mile):**

44% of entire zone

42% of all cities and towns

44% of population

SPCS = State Plane Coordinate System

ppm = parts per million

ft = feet

m = meter

km = kilometer

**Distortion values (ppm)****Entire zone:**

Min = -418 Range = 597

Max = +179 Mean = -91

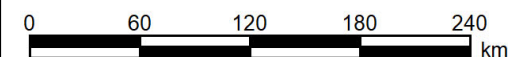
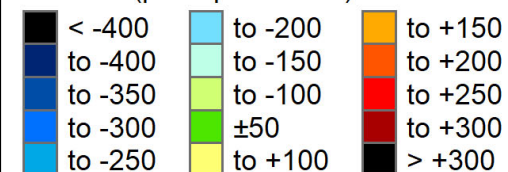
**Cities:**

Min = -300 Range = 469

Max = +169 Median = -109

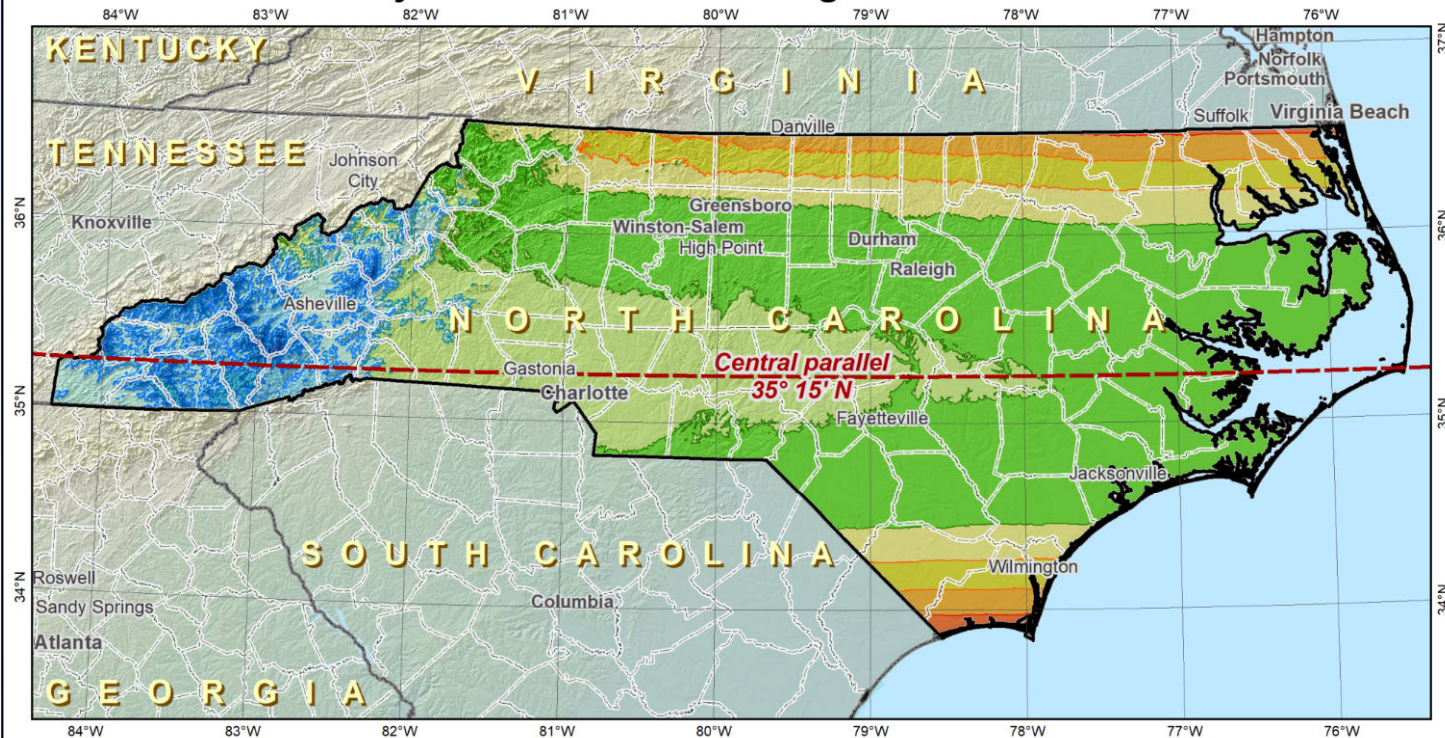
Mean = -103

(weighted by population)

**Linear distortion at topographic surface (parts per million)**



## Preliminary SPCS2022 default design: North Carolina Zone



### Lambert Conformal Conic projection

North American Terrestrial Reference Frame of 2022

Central parallel: 35° 15' N

Central parallel scale: 0.999 95 (exact)



NOAA's  
National  
Geodetic  
Survey

**Areas within  $\pm 100$  ppm distortion  
(1:10,000 =  $\pm 0.53$  ft per mile):**

90% of population  
78% of all cities and towns  
76% of entire zone area

### Distortion values (ppm)

#### Entire zone:

Min = -341 Range = 597  
Max = +256 Mean = -14

#### Cities and towns:

Min = -222 Mean = -25  
Max = +246 (weighted by  
Range = 469 population)

Created 03/10/2019

### Linear distortion at topographic surface (parts per million)

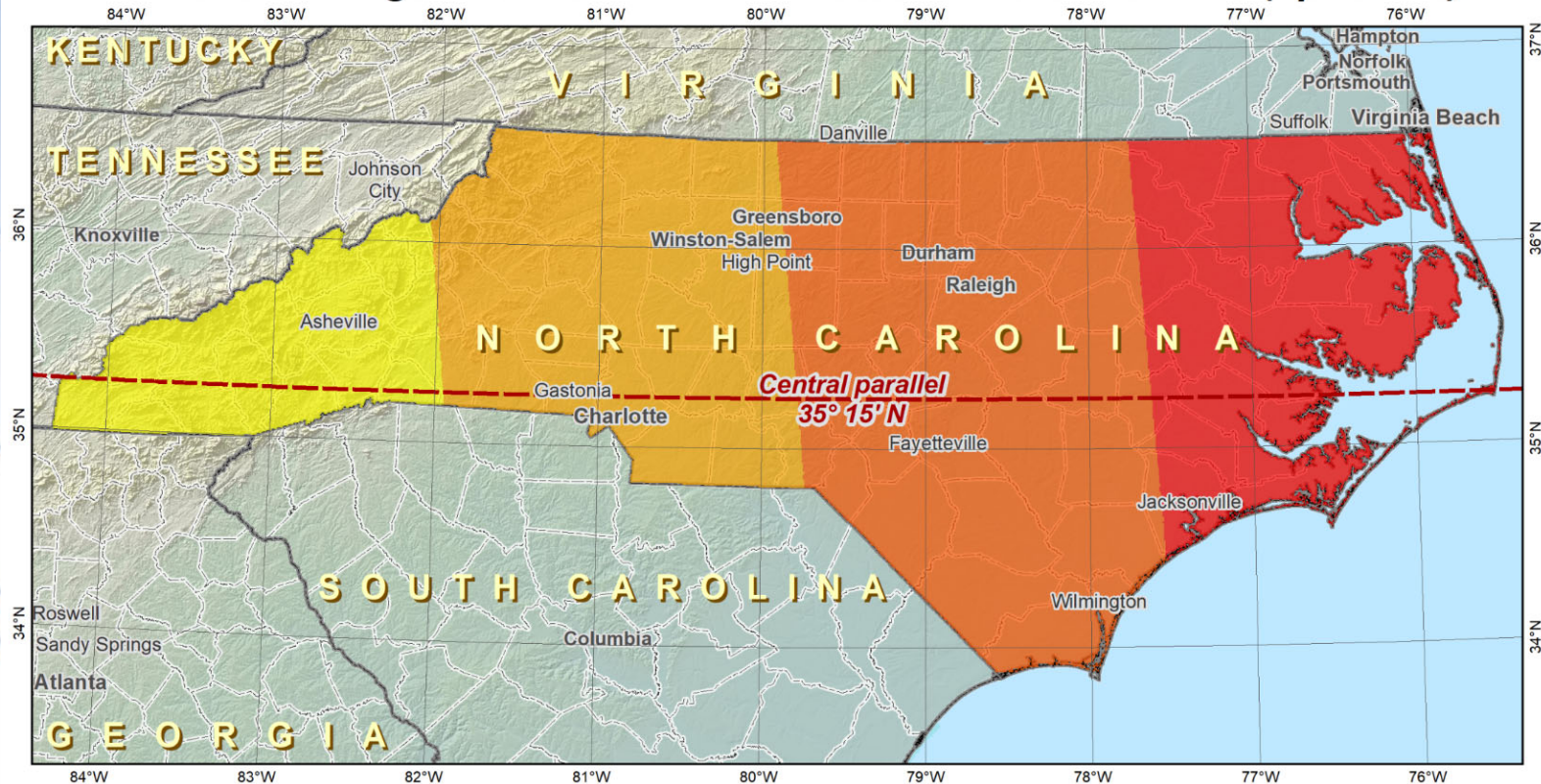
< -400	to -200	to +150
to -400	to -150	to +200
to -350	to -100	to +250
to -300	$\pm 50$	to +300
to -250	to +100	> +300



Option 2b



## Horizontal change in SPCS2022 coordinates for North Carolina (option 2b)

**Lambert Conformal Conic projection**

North American Terrestrial Reference Frame of 2022

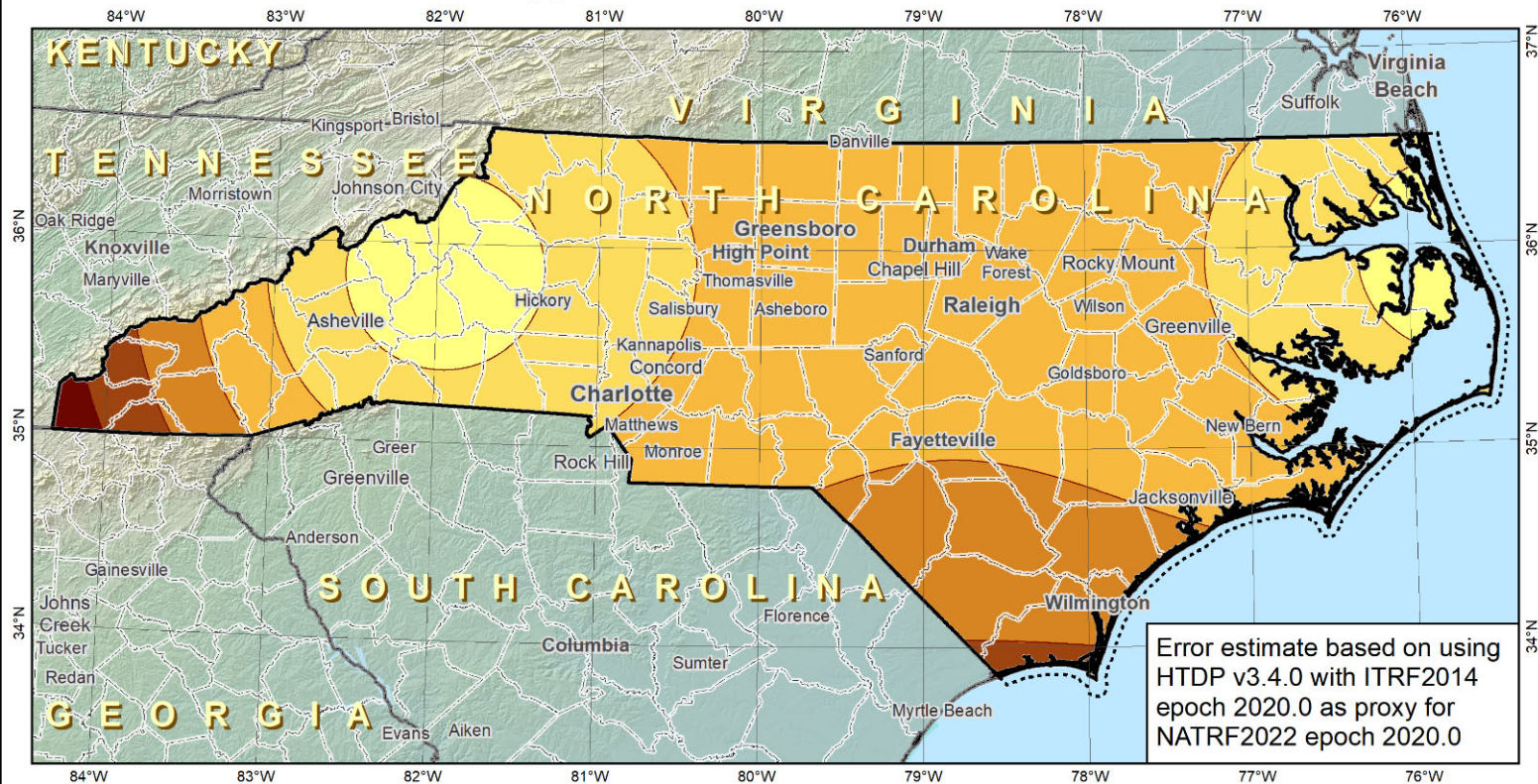
**Central parallel: 35° 15' N****Central parallel scale: 0.999 95 (exact)**NOAA's  
National  
Geodetic  
Survey**Areas within ±100 ppm distortion  
(1:10,000 = ±0.53 ft per mile):**90% of population  
78% of all cities and towns  
76% of entire zone area**Option 2b: Reference frame  
plus parameter change:****False northing = 200,000 m****False easting = 1,000,000 m****(same central meridian as  
SPCS 83)****Maximum relative change:****Delta north = 77 ft****Delta east = 205 ft****Horizontal change in coordinates**

Yellow	1,285,445 to 1,285,500 sft
Orange	1,285,500 to 1,285,550 sft
Red-orange	1,285,550 to 1,285,600 sft
Red	1,285,600 to 1,285,650 sft





# Estimated horizontal error of approximate transformation between SPCS 83 and SPCS2022



Error estimate based on using HTDP v3.4.0 with ITRF2014 epoch 2020.0 as proxy for NATRF2022 epoch 2020.0

**Transformation parameters (for SPCS 83 U.S. survey feet and SPCS2022 international feet):**

Scale,  $s = 1.00009$

Translation north,  $tN = 110,207$

Translation east,  $tE = 1,280,658$



NOAA's  
National  
Geodetic  
Survey

**Horizontal transformation error (feet):**

Max = 1.45 Standard deviation = 0.22

Mean = 0.57 Root mean square = 0.61

**Transformation equations**

**SPCS83 to SPCS2022:**

$N2022\_ift = s * N83\_sft + tN$

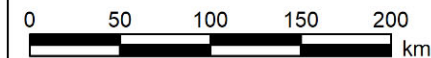
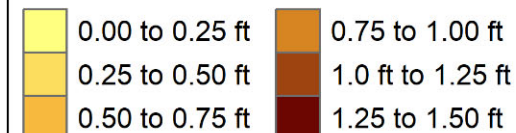
$E2022\_ift = s * E83\_sft + tE$

**SPCS2022 to SPCS83:**

$N83\_sft = (N2022\_ift - tN) / s$

$E83\_sft = (E2022\_ift - tE) / s$

**Estimated horizontal error of approximate transformation (feet)**



Created 1/20/2022 (Michael Dennis)



# Get Prepared

## Get Prepared

### 1. Transform Data

Tools will be available to transform your coordinates from historic datums (NAVD 88, NAD 83, etc.) to coordinates in the modernized NSRS at the first reference epoch of the modernized NSRS (2020.00) using **NGS Coordinate Conversion and Transformation Tool (NCAT)**.

**NOTE:** Depending on your accuracy requirements, consider saving original observation files and/or plan for re-observations.

### 2. Record Metadata

Knowing the datums and epochs for your geospatial files will simplify your datum transformations, so require complete metadata in all surveying and mapping contracts.

### 3. Perform GPS on Bench Marks Operations

Obtain accurate NAD 83 ellipsoid heights on NAVD 88 bench marks to improve the transformation tool for the new geopotential ("vertical") datum.

### 4. Review State Plane Coordinate System of 2022 (SPCS2022) requirements

**SPCS2022 policy and procedures** documents and forms give the requirements for developing SPCS2022. The procedures and forms include contact information and instructions for requesting and proposing SPCS2022 zones.

### 5. Prepare to update legislation, as needed

The National Society of Professional Surveyors (**NSPS**), the American Association of Geodetic Surveying (**AAGS**), and NGS created **template legislation** to aid states in transitioning their legislation to new wording. Contact NSPS, AAGS, your state affiliate, or your local chapter for more information. Examples of new state legislation are available for **download**. The map below shows the status of legislation for the State Plane Coordinate Systems of 1983 and 1927 for all U.S. states and territories.







# FEDERAL REGISTER

The Daily Journal of the United States Government



N Notice

## Deprecation of the United States (U.S.) Survey Foot

A Notice by the National Institute of Standards and Technology on 10/17/2019



### AGENCY:

The National Institute of Standards and Technology and the National Geodetic Survey (NGS), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce (DOC).

### ACTION:

Notice; request for comment.

### SUMMARY:

The National Institute of Standards and Technology (NIST) and the National Geodetic Survey (NGS), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), are taking collaborative action to provide national uniformity in the measurement of length. This notice announces a decision to deprecate the use of the "U.S. survey foot" on December 31, 2022. After that date, the "U.S. survey foot" will be superseded by the "foot" (formerly known as the "international foot"), which is already in use throughout the U.S. This notice describes the plan, resources, training, and other activities of NIST and NOAA that will assist those affected by this transition, and invites comments and other information from land surveyors, engineers, Federal, State and local government officials, businesses, and any other member of the public engaged in or affected by surveying and mapping operations.



North Carolina Emergency Management





## A tale of two feet

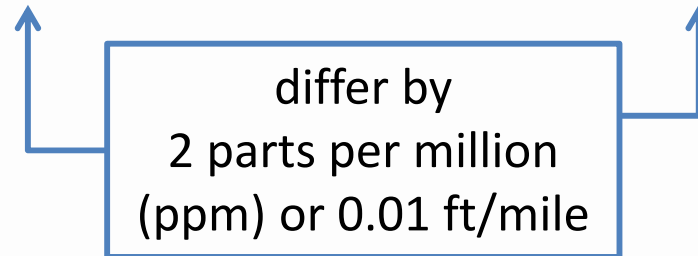


### Two versions of “foot” in current use:

“Old” U.S. survey foot ➡ “New” international foot

1 ft = 0.3048006096... m

1 ft = 0.3048 m *exactly*



***A real problem with real costs***



## An NGS proposal

- **Only one foot after 2022 (1 foot = 0.3048 meter)**
  - Make official through NIST
  - ***NO*** option for U.S. survey foot
- **NGS will help with the transition**
  - Will fully support backward compatibility
  - Use “correct” foot for SPCS 83 and SPCS 27
  - Automatically done by NGS products and services
- **Guiding ideas**
  - Best opportunity to make the change
  - Of all changes in 2022, this is the least significant
  - Will make things better
  - About the ***future***, not the past



## The problem (and some questions)

- **Two versions of same unit in current use**
  - “New” international foot and “old” U.S. survey foot
  - “New” shorter than “old” by 2 ppm (**0.01 ft per mile**)
  - A *real* problem with *real* costs
- **What’s in a name?**
  - “U.S. survey” versus “international”
- **Who is using U.S. survey feet?**
  - Surveyors exclusively, in most (*not all*) states
  - But it impacts everyone
- **What should we do?**
  - Begin with a *conversation*



## Kicking the can (Federal Register) 1959

“Any data expressed in feet derived from and published as a result of *geodetic surveys* within the United States will continue to bear the following relationship as defined in 1893:

$$1 \text{ foot} = 1200/3937 \text{ meter}$$

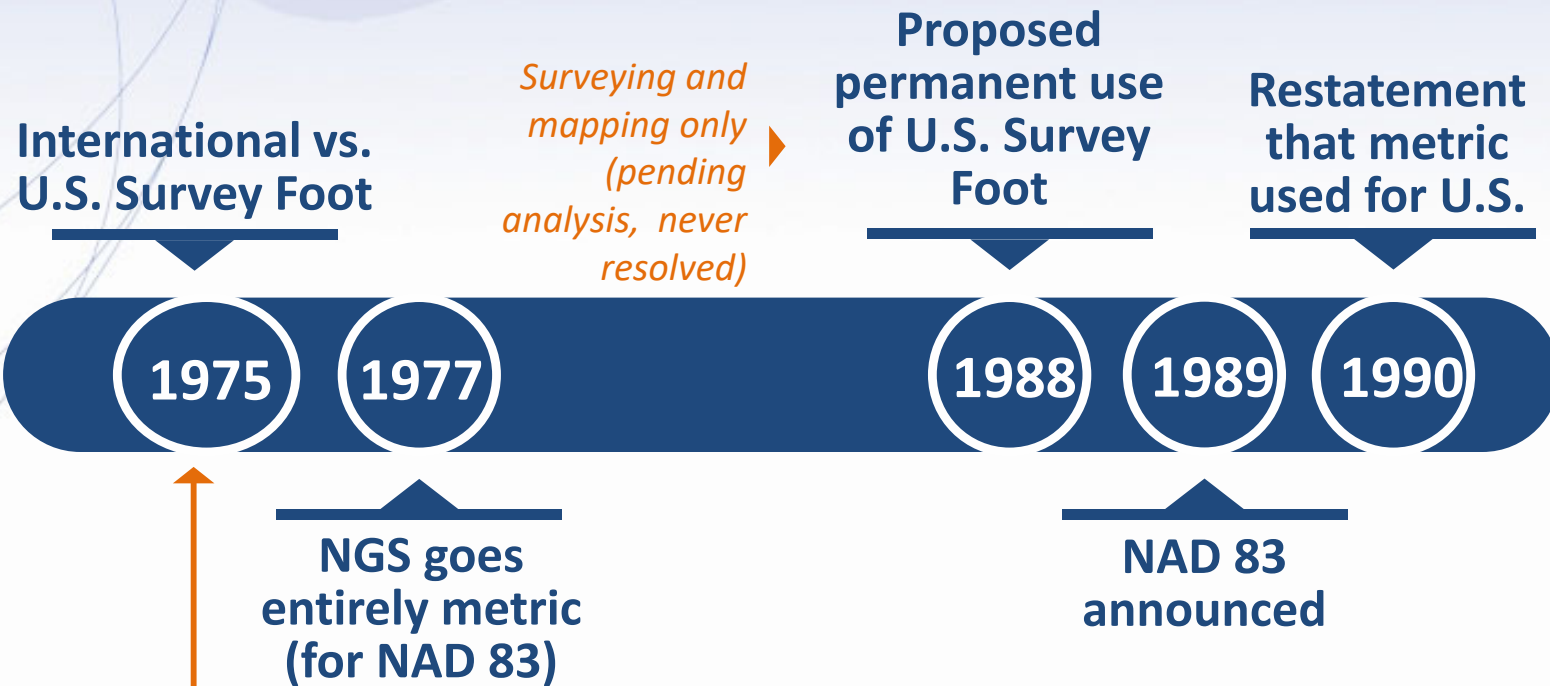
The foot unit defined by this equation shall be referred to as the **U.S. Survey Foot** and it shall continue to be used, for the purpose given herein, **until such a time as it becomes desirable and expedient to readjust the basic geodetic survey networks in the United States, after which the ratio of a yard, equal to 0.9144 meter, shall apply.”**

[https://geodesy.noaa.gov/PUBS\\_LIB/FedRegister/FRdoc59-5442.pdf](https://geodesy.noaa.gov/PUBS_LIB/FedRegister/FRdoc59-5442.pdf)

Signed by NBS and C&GS directors, approved by Secretary of Commerce, June 25, 1959

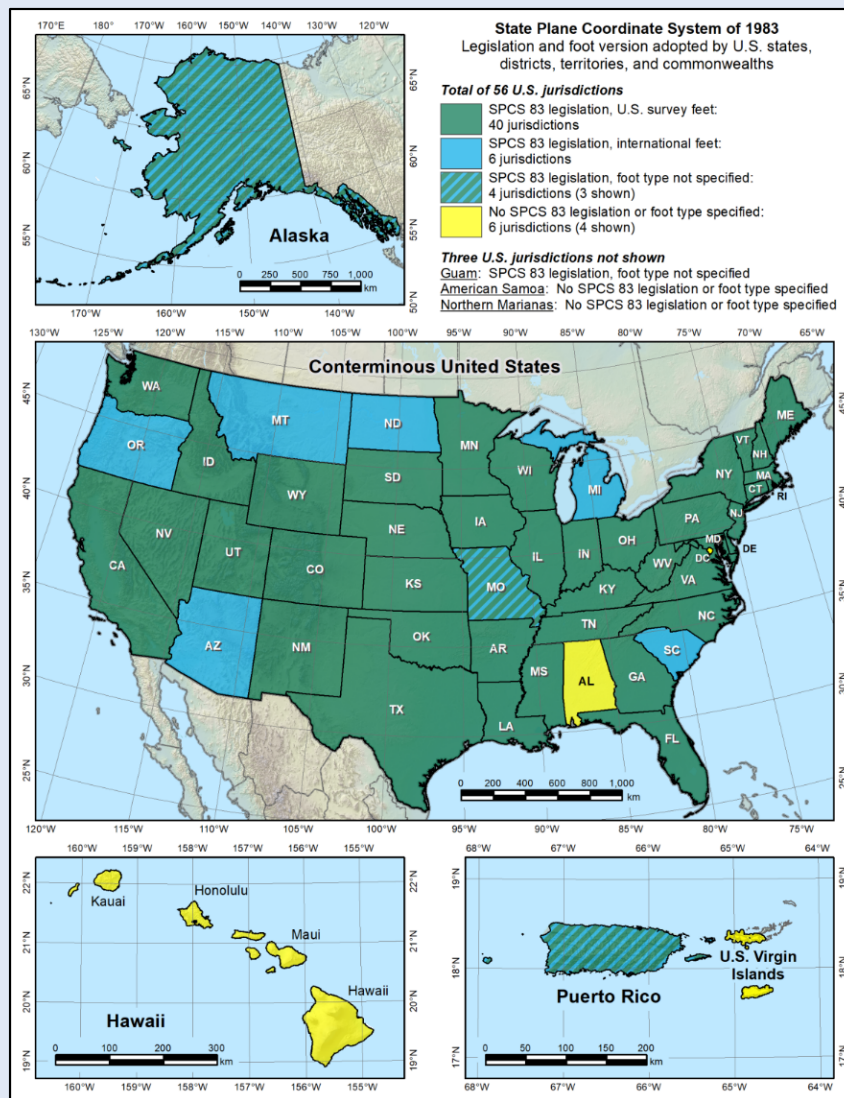


## More Federal Register Notices



- International foot used for "engineering"
- U.S. survey foot used for "mapping and land measurement"





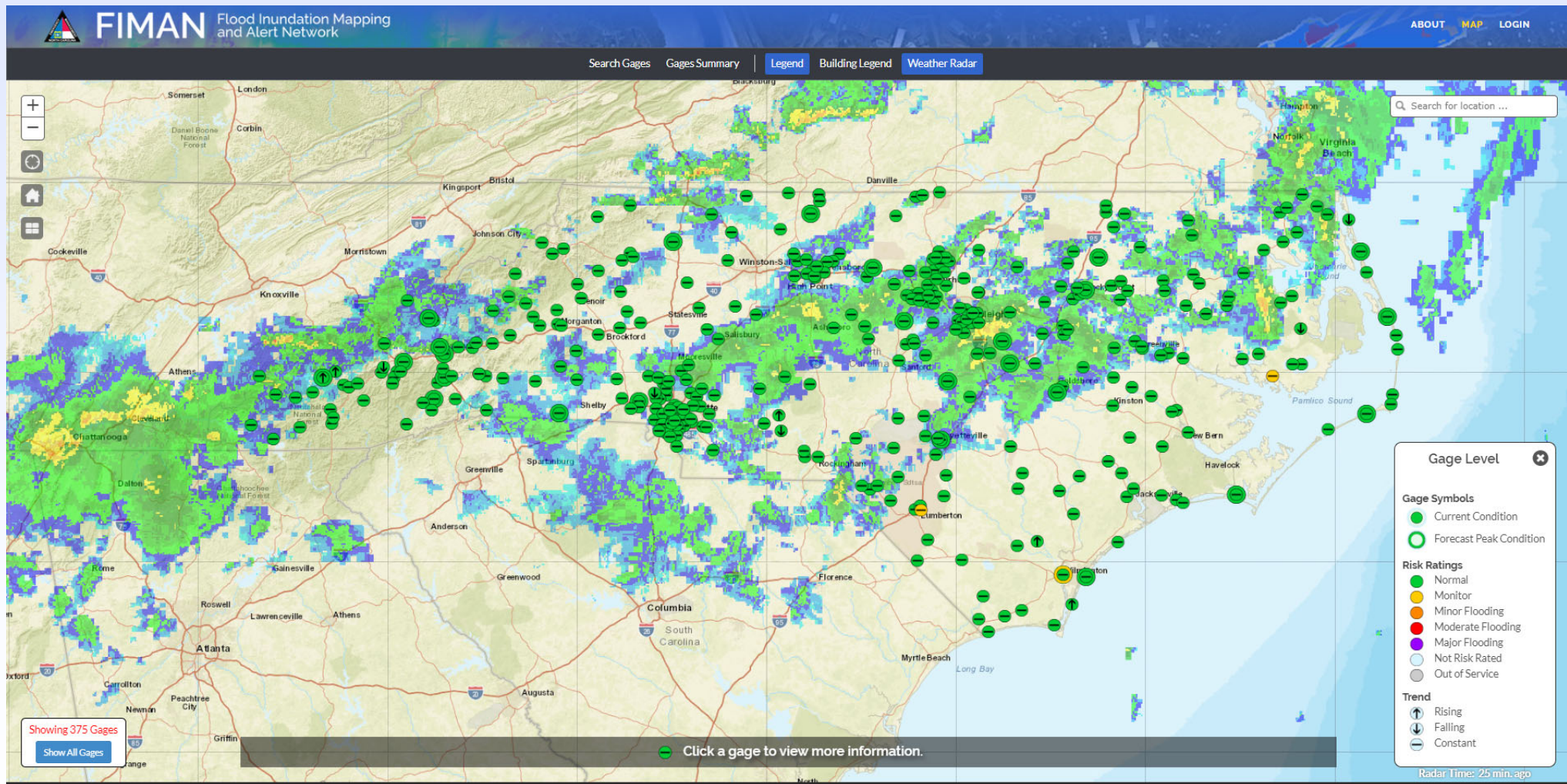
North Carolina Emergency Management





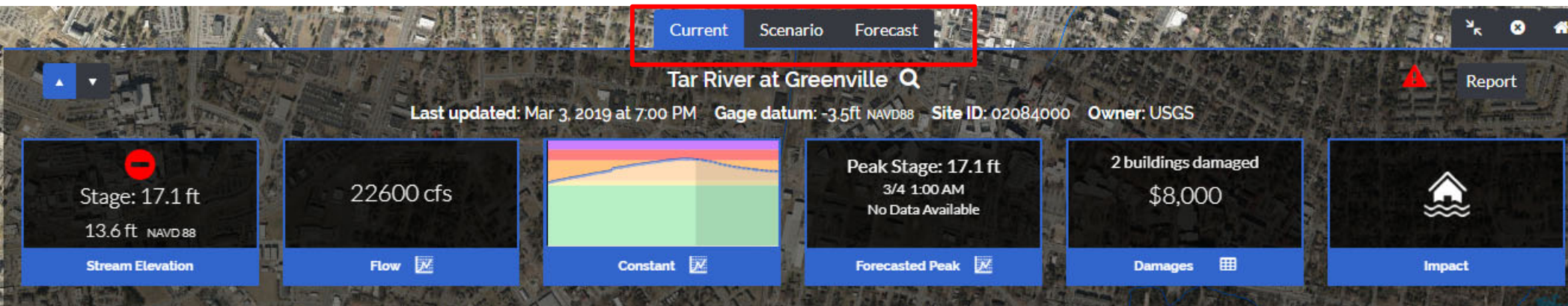
# Flood Inundation Mapping and Alert Network (FIMAN)

(<https://fiman.nc.gov/>)





# Dashboard Concept



- Three Tabs
  - **Current:** Provides most recent gage data
  - **Scenario:** Planning tool for visualization and impact
  - **Forecast:** Shows timeline using NWS forecast data
- Info Widgets
  - Interactive for stage, flow, forecast, impacts



# Flood Scenario Mode

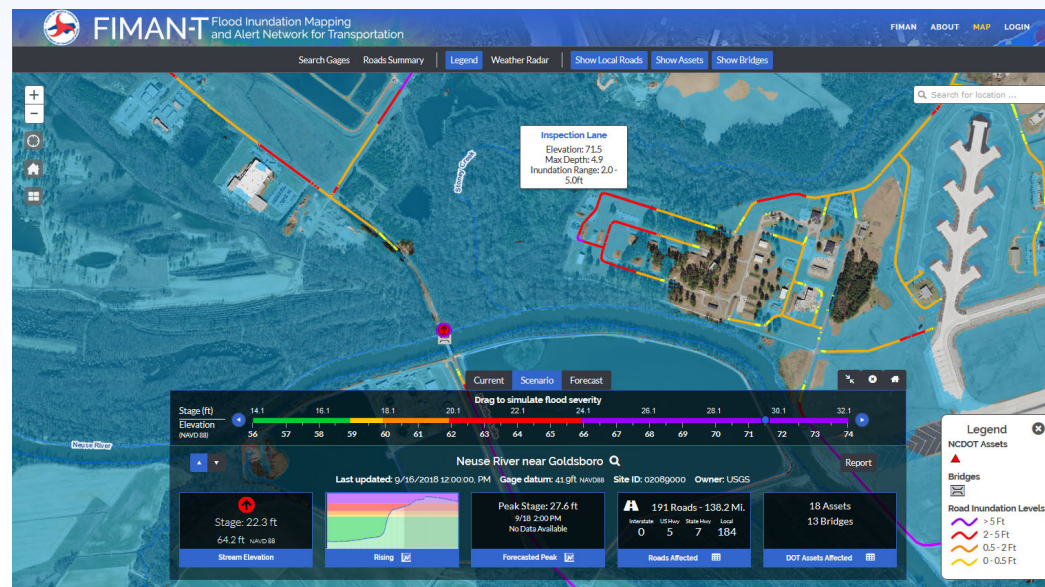




# FIMAN- Transportation (T): Current, Forecast and Scenario Road Impacts

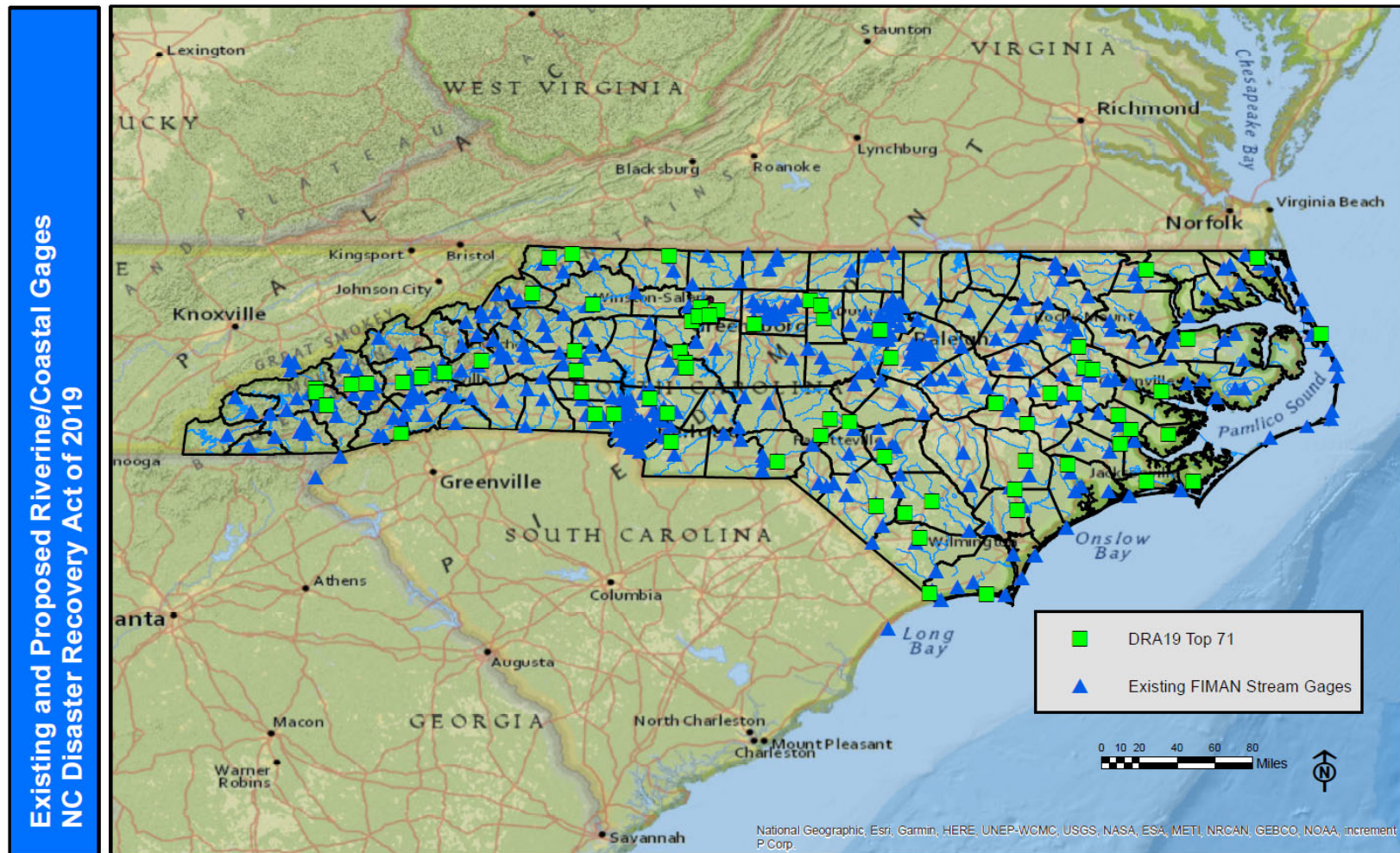
FIMAN-T displays impacts to roads, bridges, and assets in 3 ways:

- Current: Using gage readings every 15 minutes, the web application displays real-time flooding extents and impacts.
- Scenario: Allows users to show impacts at various flood levels for scenario planning.
- Forecast: Based on the NWS forecasted hydrograph, FIMAN-T allows impacts to be visualized at the predicted peak flooding.



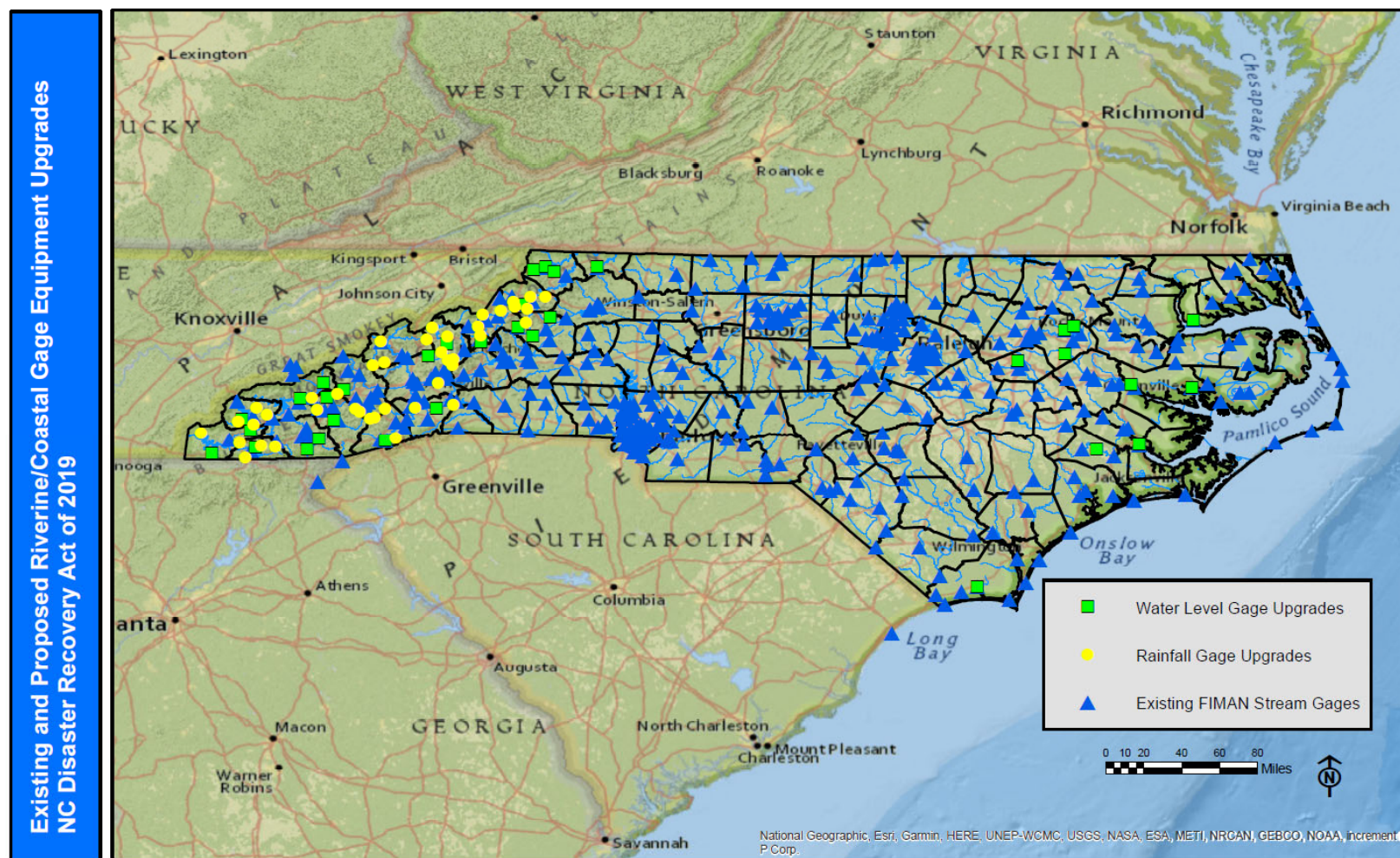


# New Stream Gauges





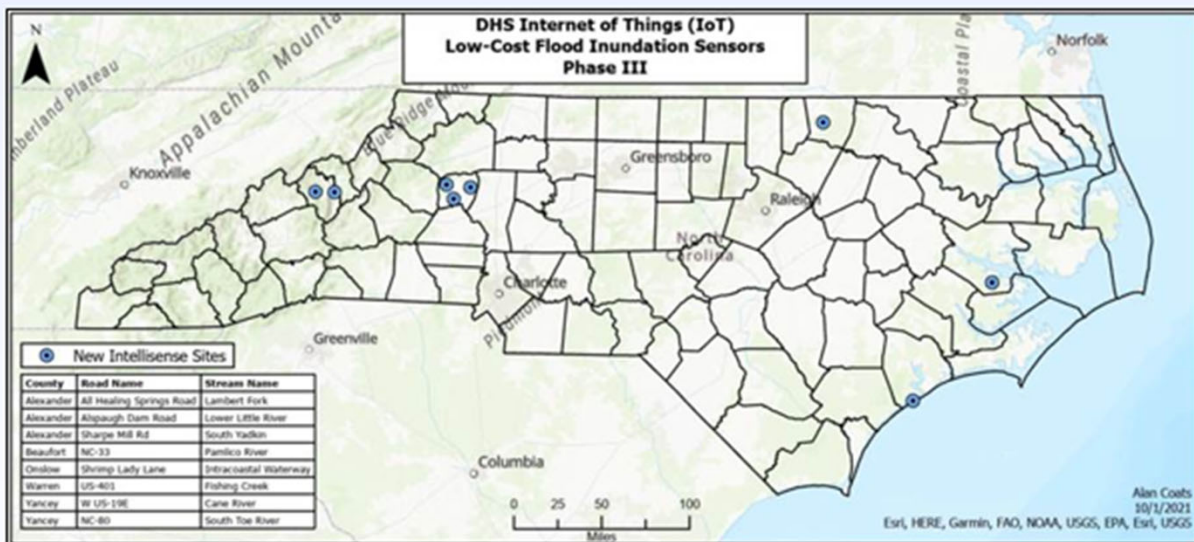
# Existing Rainfall/Stream Gauge Upgrades













# Low Cost Flood Inundation Sensor Test Site

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- Partnering with NC A+T State University (Geomatics)
- Project funding provided by:
  - UNC –CH North Carolina Policy Collaboratory





# Adopt a Gauge

## Adopt a Gauge

North Carolina's network of more than 500 river, stream and coastal gauges provides data that empowers flood warning for local communities and the public.

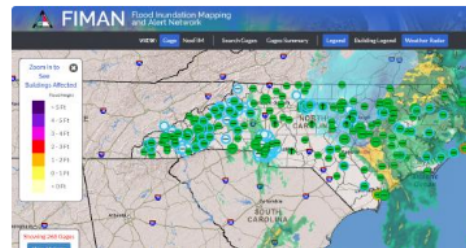


Data from these gauges drives the Flood Inundation Mapping and Alert Network (FIMAN) which is designed reduce the loss of life and flood related property damage by providing timely, detailed, and accurate flood inundation information to government officials and the public. For FIMAN to provide timely and accurate information, data from these gauges must be obtained 24 hours a day, seven days a week with no interruptions.

Gauge maintenance is critical to being able to provide continuous data to community officials and the public. North Carolina Emergency Management has created the Adopt a Gauge (AaG) program to partner with local officials to insure that gauges are operational and to notify NCEM when a gauge needs repair.

[Submit a gauge report →](#)

The Adopt a Gauge program allows a county or local government to adopt the gauges in their community and serve as eyes on the ground for those gauges. Adopt A Gauge partners regularly check the status of their assigned gauge sites, reporting problems (debris buildup, damage, theft) or simply reporting that the gauge is in good condition. While we have online monitoring tools having eyes in the field can aid in initially assessing any issues with a site.



### Risk Management

[Adopt a Gauge](#)

[Adopt a Gauge - Reporting](#)



# Adopt a Gauge Reporting

[NC DPS](#) » [Our Organization](#) » [Emergency Management](#) » [Risk Management](#) » Adopt a Gauge - Reporting

## Adopt a Gauge - Reporting

**Risk Management**

[Adopt a Gauge](#)

**Adopt a Gauge - Reporting**

Thank you for participating in Adopt a Gauge!  
Enter observations from your gauge site visits here.

Name \*

Phone number \*

E-mail address \*

Date of inspection \*

Month	▼	Day	▼	Year	▼	
-------	---	-----	---	------	---	---

County \*

- Select - ▼

Notes on gauge condition \*

Is gauge in good operating condition? If not, please describe any damages, defects or issues.

Submit





# High Water Mark (HWM) Photo Application

**High Water Mark Location**

Please Mark the location of the building or object that exhibits a high water mark from flooding. Search for your location by using the buttons provided below, or use the zoom and pan tools to move the map to your exact location. Attach a photo to help surveyors locate the mark.

**1. Enter Information**

Name of Collector

Photo Type

Notes (<150 char)

Attach a photo of the high water mark

**2. Select Location**

Specify the location for this entry by clicking/tapping the map or by using one of the following options.

## High Water Mark Location Collection Tool

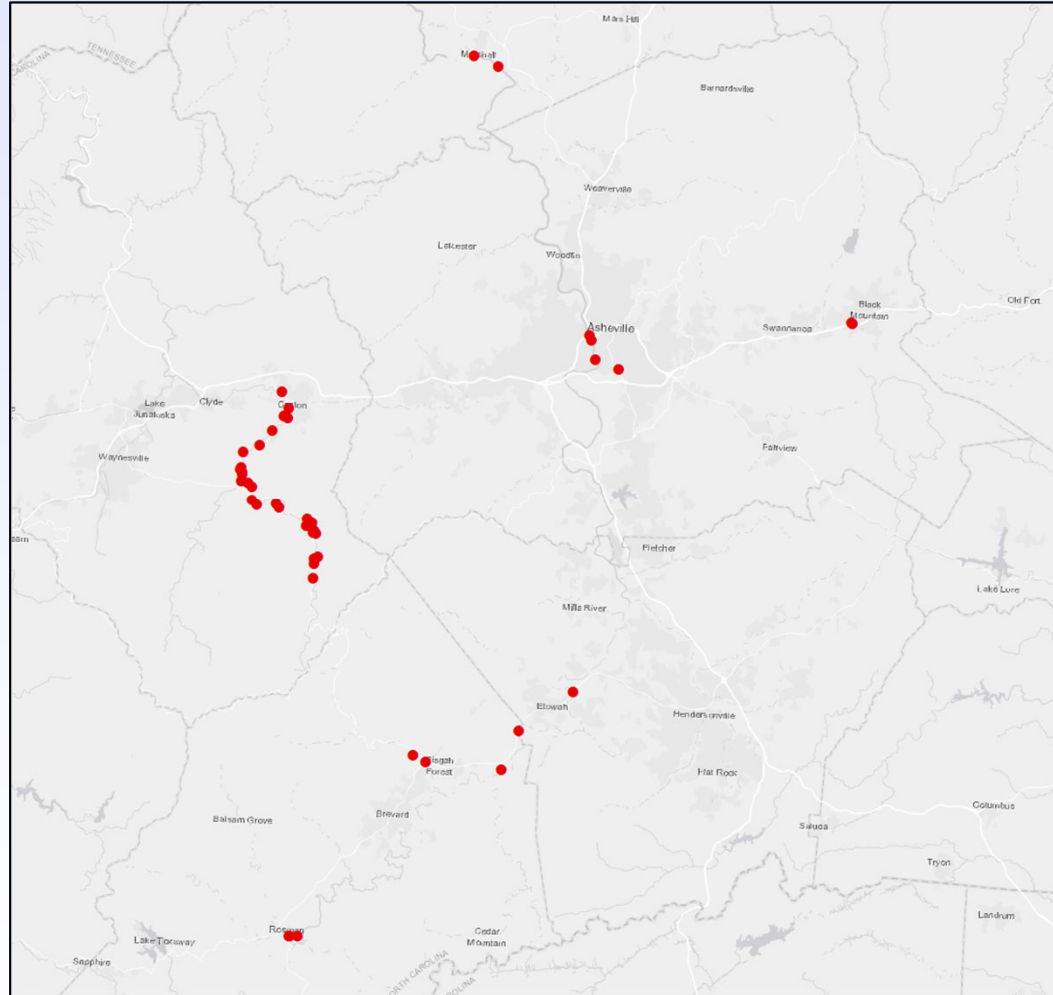
The high water mark collection tool can be accessed using the link below:

[https://ncgs.state.nc.us/pages/Other\\_Programs.htm](https://ncgs.state.nc.us/pages/Other_Programs.htm)





# High Water Marks Collected in Western North Carolina (August 2021)





# High Water Marks Collected in Western North Carolina (August 2021)





# National Geodetic Survey (NGS) Conversion and Transformation Tool (NCAT)

The screenshot shows the NGS Coordinate Conversion and Transformation Tool (NCAT) interface. The header includes the NGS logo and the title "NGS Coordinate Conversion and Transformation Tool (NCAT)" with "National Geodetic Survey" below it. A navigation bar contains links: "NGS Home", "About NGS", "Data & Imagery", "Tools", "Surveys", "Science & Education", and a search box. Below the navigation bar are tabs: "Single Point Conversion", "Multipoint Conversion", "Web services", "Downloads", and "About Conversion Tool".

The main content area is titled "Convert/Transform from:" and includes several options:

- ☒ Horizontal
- ☐ Horizontal+height
- ☐ XYZ

Below these is "Select the type of horizontal coordinate:" with options:

- ☒ Geodetic lat-long
- ☐ SPC
- ☐ UTM
- ☐ USNG

On the left is a map of the United States with a blue location pin in the central region. Below the map is a "Submit" button.

Input fields for coordinates are provided:

- Enter lat-lon in decimal degrees:**  
Lat: 39.2240867222  
Lon: -98.5421515000
- or degrees-minutes-seconds:**  
Lat: N 39-13-26.71220  
Lon: W 098-32-31.74540

Below the input fields is a note: "Don't see a reference frame in the list? Click here to learn more." and a "SPC zone" dropdown set to "Auto Pick (default zone)".

At the bottom, there are two dropdowns for "Input reference frame (historically called 'horizontal datum')" and "Output reference frame (historically called 'horizontal datum')", both set to "NAD83(2011)".

At the bottom left, there is a link "Export Results to" with icons for PDF, Excel, CSV, and a code editor.



# Questions?

---



Gary Thompson, PLS  
NC Emergency Management  
Risk Management/Geodetic Survey  
4105 Reedy Creek Road  
Raleigh, NC 27607

Main office: 919-733-3836  
Direct line: 919-948-7844

[gary.thompson@ncdps.gov](mailto:gary.thompson@ncdps.gov)



**North Carolina Emergency Management**







FEMA



# Electronic Letter of Map Amendment (eLOMA)

## Overview

The Federal Emergency Management Agency (FEMA) has designed a web-based tool for licensed land surveyors and professional engineers (referred to as Licensed Professionals or LPs) and other FEMA permitted Certified Professional (CPs) to submit selected Letter of Map Amendment (LOMA) requests, known as an electronic Letter of Map Amendment (eLOMA). A LOMA is an official amendment to an effective Flood Insurance Rate Map (FIRM), typically issued to remove a property and/or structure from a Special Flood Hazard Area (SFHA). The eLOMA tool is designed to replace the traditional lengthy LOMA process by allowing LPs and CPs to expedite LOMA requests that meet eLOMA criteria for their clients.

## Benefits

The eLOMA tool provides the following key benefits for LPs and CPs:

- **Quick and Easy.** Provided all required information is submitted and meets eLOMA criteria, receive and email or print a FEMA determination within minutes of submitting an application, opposed to a lengthy manual process that can take up to 60 days. The expedited process allows LPs and CPs to serve home or property owners in a timely manner in determining mandatory flood insurance purchase requirements.
- **Accepts a majority of LOMA requests.** Submit LOMA requests, including requests for single or multiple residential lots or structures that are not considered to be within a coastal zone or modified by fill to raise the elevation of the structure.
- **Online and One Central Location.** Check the status of an application, communicate required actions with FEMA point of contacts, and register and renew eLOMA license information all within the tool.
- **Tracking Features.** Track all submitted applications and view saved eLOMA data for a period of 3 years.
- **No Cost.** There is no fee to use the eLOMA tool or receive an eLOMA determination.

Visit the eLOMA Tool at:  
<https://hazards.fema.gov>

## Contact Us

For inquiries on flood hazard mapping and floodplain management related topics, contact the FEMA Map Information eXchange (FMIX):

Toll free at 1-877-FEMA MAP (1-877-336-2627), or email [FEMAMapSpecialist@riskmapcdfs.com](mailto:FEMAMapSpecialist@riskmapcdfs.com)  
Hours of Operation: Monday through Friday, 8:00 am - 6:30 pm ET

Live chat available 9:00am to 5:00pm ET on the FMIX page at [http://www.floodmaps.fema.gov/fhm/fmx\\_main.html](http://www.floodmaps.fema.gov/fhm/fmx_main.html)

For IT system related inquiries, contact the Mapping Information Platform (MIP) Help Desk at: [miphelp@riskmapcdfs.com](mailto:miphelp@riskmapcdfs.com)

**RiskMAP**  
Increasing Resilience Together



## How eLOMA Differs from Online Letter of Map Change (LOMC) & the Traditional LOMA Paper Form Process

An eLOMA determination document serves the same function as a standard LOMA that was completed via the Online LOMC tool ([www.fema.gov/Online-LOMC](http://www.fema.gov/Online-LOMC)) or the MT-EZ or MT-1 paper forms submitted by mail. The Online LOMC tool is available to any applicant, including home or property owners who wish to submit a LOMC request online. All LOMC requests may be processed through Online LOMC, including amendment and revision requests. A LOMA determination via Online LOMC or the MT-EZ or MT-1 paper form may take up to 60 days to process, compared to a potentially instant eLOMA determination.

The eLOMA tool allows for less mailing and printing of supporting data forms and expedites the electronic transfer and tracking of data.

## eLOMA Determination Process

Users have the option to create a new or resume a saved application. After submitting all required data and documentation, including appropriate certified elevation information, eLOMA will determine if the submitted Lowest Adjacent Grade (LAG) or Low Lot Elevation (LLE) of the structure or property is found to be above the 1-percent-annual chance Base Flood Elevation (BFE), thus waiving the federal insurance requirement.

If the application has not been selected for audit and is approved, the user will instantly receive a generated final determination that is quick and easy to print or email to a client. If the application is selected for an audit, instructions will be communicated to the user to submit additional documentation within the eLOMA tool to assist in the application's review process. eLOMA users may also check the status of their application by logging into the tool and viewing their workbench to monitor status and complete required action. If the FEMA auditor rejects the application, the auditor will transfer the application and submitted data to the standard LOMA process without the user having to submit through another process.

Incorrect eLOMA determinations can be rescinded by FEMA and be superseded by a standard LOMA. Incorrect determinations may have a negative impact

on the user's access to eLOMA and submitting applications in the tool.

## Determine if eLOMA is Right for You

Determine if your request meets eLOMA criteria by answering the following pre-qualifying questions:

- Has fill been placed, or will fill be placed, to raise the elevation for the subject of the request?
- Is the request for a proposed structure, a proposed portion of property, or a proposed legally recorded parcel of land?
- Is the subject of the request located on an alluvial fan or coastal flood hazard area (V Zone)?
- Is there a LOMA application currently being processed by FEMA for the subject of the request?

If you answered "No" to each question, your request qualifies for an eLOMA determination.

The eLOMA tool does not accept: Conditional Letters of Map Amendment (**CLOMA**), Conditional Letters of Map Revision Based on Fill (**CLOMR-F**), Letters of Map Revision (**LOMR**), Letters of Map Revision Based on Fill (**LOMR-F**), or requests located within alluvial fan or Flood Zone V areas.

## Account Registration and Renewal

If you are a LP or FEMA approved CP, create an eLOMA account with your license and contact information within the eLOMA tool. Users may update their account, including providing new or updated license information or resetting their password.

## Additional User Resources

Visit the eLOMA webpage and tutorial at ([https://hazards.fema.gov/femaportal/resources/what\\_is\\_eloma.htm](https://hazards.fema.gov/femaportal/resources/what_is_eloma.htm)) to learn more about the tool's features and submission process.

If you need further assistance on understanding Elevation Certificates, BFE calculations, or other related flood hazard mapping and floodplain management related topics, contact a Map Specialist from the FEMA Map Information eXchange (FMIX) at [https://floodmaps.fema.gov/fhm/fmx\\_main.html](https://floodmaps.fema.gov/fhm/fmx_main.html).

**RiskMAP**  
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## **eLOMA: A Collaborative Tool for Licensed Professionals, Communities and FEMA**

David Mummert, FEMA eLOMA Coordinator  
[DMummert@mbakerintl.com](mailto:DMummert@mbakerintl.com)

eLOMA is an interactive online MT-1 determination tool, which is available on the Mapping Information Platform (MIP) ([www.hazards.fema.gov](http://www.hazards.fema.gov)). This time saving, user-friendly web-based application provides licensed land surveyors and professional engineers (Licensed Professionals or LPs) with a system to submit Letter of Map Amendment (LOMA) requests to FEMA. This tool is designed to make a determination based on the information submitted by the LP and allow them to generate a determination from FEMA in a fraction of the time that is required for the standard LOMA process.

Approximately 75% of the LOMA applications FEMA receives annually meet the eLOMA criteria and could be submitted using the eLOMA tool. An eLOMA determination document serves the same functions as a standard LOMA determination. The main purpose of eLOMA is to reduce the level of effort to process LOMAs and provide a faster method of generating LOMA determinations. The eLOMA process has significantly reduced the determination time of up to 60 days (standard LOMA processing) when an audit is not required. Even when an audit is required the audit is processed within 5 business days of FEMA receiving all of the required supporting data.

The tool has been updated to make the eLOMA process even easier to use. The audit selection criteria have been revised so that fewer eLOMA submittals are selected to be audited. Also, more help links have been added to the eLOMA tool to provide more information about the requirements for the data entry fields.

Once an eLOMA LP has demonstrated that they have a comprehensive understanding of the eLOMA application process they can be promoted to eLOMA Super User status. Typically, in order to be promoted to the Super User level an LP has to submit three consecutive eLOMAs that have complete supporting data and that require zero corrections, and they also need to use the eLOMA tool on a regular basis. Once an LP reaches the Super User level their audit frequency is reduced dramatically. Super Users are not subjected to many of the automatic audit triggers that default users are and even when Super Users are audited the turnaround time for those audits is typically shorter than it is for default users.

In order to begin using eLOMA, a surveyor or engineer sets up an account through the MIP using individual license certification information. Once the LP is registered on the MIP they can log into eLOMA and start submitting MT-1 applications. For more information on eLOMA, please select the 'Learn about eLOMA' link on the MIP homepage.

If you have additional questions regarding the eLOMA tool, please contact the FEMA Mapping and Insurance eXchange (FMIX) at 1-877-336-2627 or [FMIX@fema.dhs.gov](mailto:FMIX@fema.dhs.gov).







## **APPLICATION FORMS FOR CONDITIONAL AND FINAL LETTERS OF MAP AMENDMENT AND LETTERS OF MAP REVISION BASED ON FILL**

### **eLOMA**

A fast alternative to using the MT-1 application is eLOMA. eLOMA is a web-based application that provides licensed land surveyors and professional engineers a system to submit simple LOMA requests to FEMA. Many LOMA requests can be submitted to FEMA using eLOMA. You can find additional information about eLOMA, including the types of LOMA requests that qualify for the eLOMA process, at <https://hazards.fema.gov>.

### **Online LOMC**

For requests that cannot be processed by eLOMA, FEMA has developed the Online LOMC tool to allow applicants to submit their requests electronically. This tool is a convenient way for applicants to upload all information and supporting documentation and check the status of their request online. Users can submit requests through this tool instead of filing the paper form via mail. You can find additional information about FEMA's Online LOMC Tool at <https://hazards.fema.gov/onlinelomc/ext/Help/loadInstructions>.

## **General Background Information**

In 1968, the U.S. Congress passed the National Flood Insurance Act, which created the National Flood Insurance Program (NFIP). The NFIP was designed to reduce future flood losses through local floodplain management and to provide protection for property owners against potential losses through an insurance mechanism that allows a premium to be paid for the protection of those most in need. The creation of the NFIP represented a major shift in Federal strategy from previous structural flood-control and disaster relief programs.

As part of the agreement for making flood insurance available to a community, the NFIP requires the community to adopt floodplain management ordinances that meet certain minimum requirements intended to reduce future flood losses. The community official or agency responsible for floodplain management in a community may be able to provide information that would be useful to a requester. This official or agency usually is responsible for engineering, public works, flood control, or planning in the community as well.

## **Use of Application Forms**

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) implemented the use of application forms for requesting revisions or amendments to NFIP maps for two reasons. First, because the forms provide a step-by-step process for requesters to follow and are comprehensive, requesters are assured of providing all of the necessary information to support their requests without having to go through an iterative process of providing additional information in a piecemeal fashion, which can result in a time-consuming and cost-intensive process. Second, use of the forms ensures that the requesters' submissions are complete and more logically structured, and generally allows DHS-FEMA to complete its review in a shorter timeframe.

The application forms included in this package were designed to assist requesters (community officials, individual property owners, and others) in gathering the information DHS-FEMA needs to determine whether property (parcels of land or structures) is likely to be flooded during the flood event that has a 1-percent-annual-chance of being equaled or exceeded in any given year (base flood). Lands that are at risk of being inundated by the base flood are called Special Flood Hazard Areas (SFHAs).

The forms in this package shall be used to request Letters of Map Amendment (LOMAs), Conditional Letters of Map Amendment (CLOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), and Conditional Letters of Map Revision Based on Fill (CLOMR-Fs), as defined below. Please note that not all of the forms apply to every request. Only those forms that apply to the request should be submitted.



<b>LOMA</b>	A letter from DHS-FEMA stating that an <b>existing</b> structure or parcel of land that has not been elevated by fill ( <b>natural grade</b> ) would not be inundated by the base flood.
<b>CLOMA</b>	A letter from DHS-FEMA stating that a <b>proposed</b> structure that is not to be elevated by fill ( <b>natural grade</b> ) would not be inundated by the base flood if built as proposed.
<b>LOMR-F</b>	A letter from DHS-FEMA stating that an <b>existing</b> structure or parcel of land that has been <b>elevated by fill</b> would not be inundated by the base flood.
<b>CLOMR-F</b>	A letter from DHS-FEMA stating that a parcel of land or <b>proposed</b> structure that will be <b>elevated by fill</b> would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

If the request is being made for a LOMA to be issued on a single residential property, the MT-EZ form, entitled "Application Form for Single Lot or Structure, Amendments to National Flood Insurance Program Maps," may be used instead of the forms in this package. Forms for this purpose may be downloaded from our website at <https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-ez>. This form is available in both an English and Spanish version.

The forms in this package and the form entitled "Application Form for Single Lot or Structure, Amendments to National Flood Insurance Program Maps," **shall not be used** in the following instances:

- Requests involving changes in Base Flood Elevations (BFEs);
- Requests involving changes in regulatory floodway boundary delineations;
- Requests for properties in alluvial fan areas;
- Requests involving property and/or structures that have been elevated by fill placed within the regulatory floodway, channelization projects, bridge/culvert replacement projects, or other flood control improvements; or
- Requests involving changes in coastal high hazard areas (V zones).

For such requests, the community must submit the request to DHS-FEMA in accordance with Title 44, Chapter I, Code of Federal Regulations (CFR), Part 65 of the NFIP regulations, which is available online at <https://www.govinfo.gov/app/details/CFR-2011-title44-vol1/CFR-2011-title44-vol1-part65>, using the separately published MT-2 application forms package entitled "Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision." Forms for this purpose may be downloaded from our website at <https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2>.

Please note that the forms in this package may be used for property that has been inadvertently included in a V zone or the regulatory floodway. However, if the property is to be removed from a V zone, it must not be located seaward of the landward toe of the primary frontal dune.

For additional assistance in completing these forms, you may consult the LOMA Tutorial, available on DHS-FEMA's Internet site at: <https://www.fema.gov/flood-maps/tutorials/letter-map-amendment>.

## Data Submission Requirements

In accordance with the NFIP regulations, DHS-FEMA will use the information provided by these application forms to make a determination on whether a property (parcel(s) of land or a structure(s)) is located within a designated SFHA. In certain instances, additional data that are not referenced on these forms may be required. A DHS-FEMA representative will notify the requester of any additional requirements.

***DHS-FEMA encourages the submission of the required data in digital format (e.g., scanned documents on a CD). This may help expedite the processing of your request.***



## Applicable Regulations

The regulations pertaining to LOMAs, CLOMAs, LOMR-Fs, and CLOMR-Fs are presented in Title 44, Chapter I, CFR, Parts 65 and 70, which is available online at [https://www.fema.gov/pdf/floodplain/nfip\\_sg\\_appendix\\_e.pdf](https://www.fema.gov/pdf/floodplain/nfip_sg_appendix_e.pdf). The purpose of Part 70 is to provide an administrative procedure whereby DHS-FEMA will review information submitted by an owner or lessee of property who believes that their property has been inadvertently included in a designated SFHA. Part 70 provides information about the technical difficulty of accurately delineating the SFHA boundaries on a NFIP map for a community. Part 70 procedures shall not apply if the topography has been altered to raise the original ground to or above the BFE since the effective date of the first NFIP map [i.e., a Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map] showing the property to be within the SFHA. Requests involving changes in topography (such as the placement of fill) are handled under the procedures described in Part 65.

## Fee Requirements

Title 44, Chapter I, CFR, Part 72 of the NFIP regulations, which is available online at <https://www.govinfo.gov/app/details/CFR-2000-title44-vol1/CFR-2000-title44-vol1-part72>, presents information regarding the fee collection procedure initiated by DHS-FEMA to allow for the recovery of costs associated with the review of requests for CLOMAs, CLOMR-Fs, and LOMR-Fs via a review and processing fee. There is no review and processing fee for requests for single/multiple, lot/structure LOMAs.

Revised fee schedules are published periodically, but no more than once annually, as a notice in the *Federal Register*. For the most up-to-date fee schedule, please contact the DHS-FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-FEMA MAP (1-877-336-2627) or consult the DHS-FEMA Internet site at <https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees>.

Payment must be submitted in the form of a check or money order, made payable in U.S. funds to the **National Flood Insurance Program**, or by credit card payment. In addition, the requester must complete the Payment Information Form. The payment should be mailed **together** with the application and supporting data to the address listed in the Address for Submitting Requests section of these instructions.

## Basis of Determination

If no fill has been placed, DHS-FEMA's determination as to whether the SFHA designation may be removed from the structure(s) on a property will be based on a comparison of the BFE with the elevation of the Lowest Adjacent Grade to the structure (lowest ground touching the structure) including any attached decks or garage. If fill has been placed, DHS-FEMA's determination will be based on a comparison of the BFE with the elevation of the lowest adjacent grade to the structure (lowest ground touching the structure) including any attached decks or garage and a completed Community Acknowledgment Form (see instructions for the Community Acknowledgment Form [Form 3] for more information).

For DHS-FEMA to remove the SFHA designation from a legally defined property or portion of property that does not have a structure on it, the elevation of the lowest ground on the property must be at or above the BFE.

Please note the following special considerations that may affect DHS-FEMA's determination:

- In areas of shallow/sheet flooding (Zone AO), the elevation of the Lowest Adjacent Grade (including deck posts) of the structure(s) must be above the surrounding grade by an amount equal to or greater than the depth shown on the NFIP map. In addition, adequate drainage paths are required to guide floodwaters around and away from the structure(s); the structure(s) should be on an elevated pad within the Zone AO area. With your application package, in addition to elevation information regarding the structure(s), provide a map showing the topographic data of the property and the immediate surrounding area, and the location of any structure(s) existing on the property (certified by a registered professional engineer or licensed land surveyor) to demonstrate that the above criteria have been met.
- If the lowest floor of a building has been elevated on posts, piers, or pilings above the BFE and any portion of the structure (i.e., posts, pilings, or piers) is still below the BFE, the building will not be removed from the SFHA.



## Response Timeframe

In accordance with the procedures of Title 44, Chapter I, CFR, Part 72, which is available online at <https://www.govinfo.gov/app/details/CFR-2000-title44-vol1/CFR-2000-title44-vol1-part72>, DHS-FEMA will notify the requester of the determination in writing within 60 days of the date of receipt of all required data. Information about the status of active Letter of Map Change (LOMC) requests is available from DHS-FEMA's Mapping Information Platform (MIP) at <https://hazards.fema.gov>. The MIP allows requesters to search Open LOMCs by entering their Project (Case) Number and Project Type to find out the status of their request. From the MIP Home Page requesters should click on Tools & Links, Public Reports and select Public Reports from the Report Category dropdown.

## Effect on Insurance Purchase Requirements

Although DHS-FEMA may issue a LOMA or LOMR-F removing a structure(s) from the SFHA, it is the lending institution's prerogative to require flood insurance, as a condition of a loan, if it deems such action appropriate. Historically, about 25% of all flood claims occur in areas outside of the SFHA.

If the lending institution agrees to waive the flood insurance purchase requirement for a structure, the property owner is eligible for a pro-rata refund of the premium paid for the current policy year, provided that no claim is pending or has been paid on the policy in question during the same policy year. To initiate processing of the refund, the property owner should provide the LOMA or LOMR-F and evidence of the waiver of the flood insurance requirement from the lending institution to the insurance agent or broker who sold the policy.

## Conditional Determinations

To qualify for a CLOMA or CLOMR-F, the proposed project must meet the same criteria as those required for a LOMA or LOMR-F. After construction is completed or fill is placed, certified as-built information must be submitted to DHS-FEMA for a LOMA or LOMR-F to be issued. The NFIP regulations do not require that a CLOMA or CLOMR-F be requested and issued for a proposed project. Check with local community officials to see if they are required.

Property owners and developers should note that a CLOMA or CLOMR-F does not remove the mandatory purchase of flood insurance requirements, it merely provides comment on the proposed plan and does not revise or amend the NFIP map. Once the project has been completed another application will have to be submitted with the as built conditions to receive a LOMA or a LOMR-F which in turn removes the federal requirements for mandatory purchase of flood insurance. It also does not relieve Federal agencies of the need to comply in carrying out their responsibilities for providing federally undertaken, financed, or assisted construction and improvements or in their regulating and licensing activities, in accordance with the provisions of Executive Order 11988 (<https://www.archives.gov/federal-register/codification/executive-order/11988.html>).

## Endangered Species Act Compliance

CLOMR-F applicants are responsible for documenting to FEMA that Endangered Species Act (ESA) compliance has been achieved prior to FEMA's review of a CLOMR-F application. ESA compliance may be documented by submitting to FEMA a copy of an Incidental Take Permit, an Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS), or an official letter from NMFS or USFWS concurring that the project has "No Effect" on proposed or listed species or designated critical habitat. The applicant may begin by contacting a NMFS or USFWS office, State wildlife agency office, or independent biologist to identify whether threatened or endangered species exist on the subject property and whether the project associated with the CLOMR-F request would adversely affect species or designated critical habitat. These entities are also available to discuss questions pertaining to listed species and ESA compliance. If potential adverse impacts could occur, then NMFS or USFWS may require changes to the proposed activity and/or mitigation.

For CLOMA, LOMA, and LOMR-F requests involving floodplain activities that have occurred already, private individuals and local and state jurisdictions are required to comply with the ESA independently of FEMA's process. These requests do not provide the same opportunity as CLOMR-Fs for FEMA to comment on the project because



CLOMAs and LOMAs do not involve a physical modification to the floodplain and because LOMR-Fs are issued only after the physical action has been undertaken in the floodplain.

**Additional information about the ESA and these requirements is available on** <https://www.fema.gov/flood-maps/change-your-flood-zone/esa> **or by requesting a copy from the DHS-FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-FEMA MAP (1-877-336-2627).** Although FEMA's staff is not available to assist with this process, NMFS and the USFWS both have staff available around the country to answer questions about threatened and endangered species and ESA compliance.

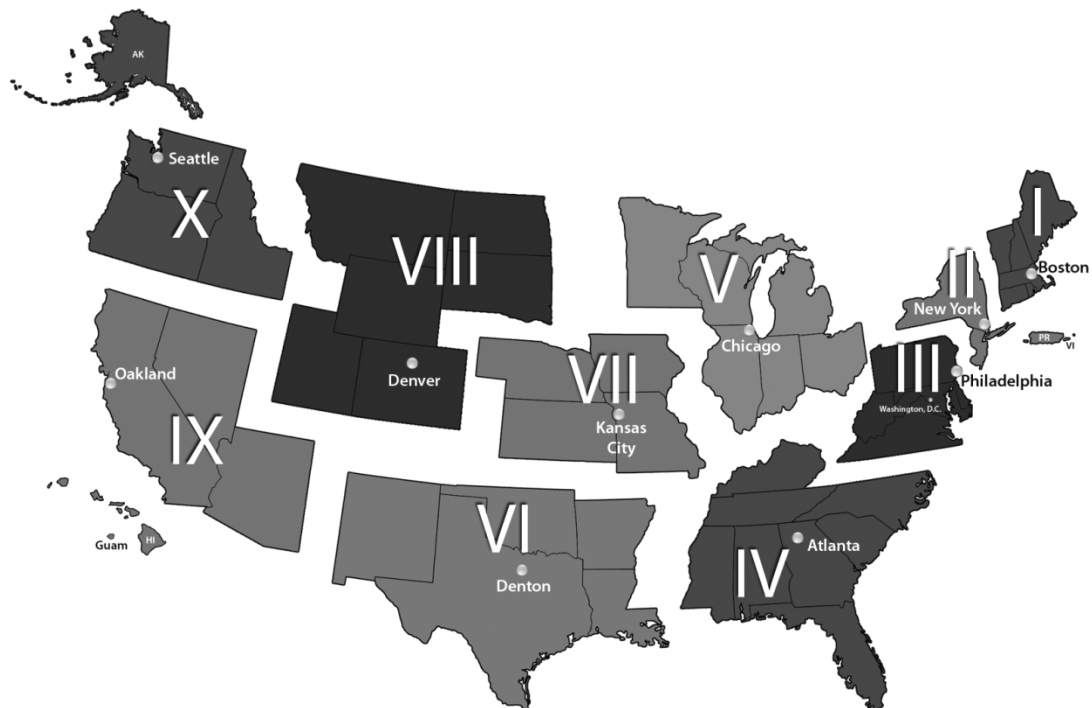
### Address for Submitting Requests

DHS-FEMA encourages electronic submissions through the Online LOMC tool at <https://hazards.fema.gov>. This tool is a convenient way for applicants to upload all required information and supporting documentation and check the status of their request online. Users can submit requests through this tool instead of filing the paper form via mail.

However, for requests submitted via mail, DHS-FEMA encourages the submission of all required data in digital format (e.g., scanned documents on a CD). Please submit all application forms and data to support a request for a flood zone determination, including any applicable fees to the address listed below. **Incomplete submissions will result in processing delays.**

**LOMC CLEARINGHOUSE  
3601 EISENHOWER AVENUE, SUITE 500  
ALEXANDRIA, VA 22304-6426**

## FEMA REGIONS





# INSTRUCTIONS FOR COMPLETING THE PROPERTY INFORMATION FORM (FORM 1)

## General Instructions

The Property Information Form (Form 1) may be completed by the property owner, or on behalf of the property owner by authorized persons including but not limited to; the property owner's agent, licensed land surveyor, or registered professional engineer to support a request for a Letter of Map Amendment (LOMA), Conditional Letter of Map Amendment (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional Letter of Map Revision Based on Fill (CLOMR-F) for existing or proposed, single or multiple lots/structures.

Before completing this form, the requester must obtain the following documents from the County/Parish Clerk, Recorder, or Register of Deeds for the community:

- A copy of the Deed for the property, showing the recordation information (e.g., Book/Volume and Page numbers or Document/Instrument number) containing the recorder's seal and recordation date, accompanied by a tax assessor's or other suitable map showing the surveyed location of the property.
- OR**
- A copy of the Plat Map for the property, showing the recordation information (e.g., Book/Volume and Page numbers or Document/Instrument number) and containing the recorder's seal and recordation date.

The requester also must obtain a photocopy of the effective FIRM panel (including the Title Block) that shows the area in which the property is located. The FIRM should be available at the community map repository or from the community official or agency responsible for floodplain management. However, digital copies of the FIRM Index and FIRM panels may be available on the Map Service Center (MSC). Interested parties may visit the MSC website at <https://msc.fema.gov/portal> or contact the DHS-FEMA Mapping and Insurance Xchange by calling 1-877-FEMA MAP (1-877-336-2627). A FIRMette, which can also be printed free of charge from the MSC website, may be submitted in lieu of a photocopy of the FIRM. Requesters without Internet access should contact the DHS-FEMA Mapping and Insurance eXchange by calling 1-877-FEMA MAP (1-877-336-2627).

Requesters should note that for multiple property (structure or lot) requests, this form should only be completed once to describe the entire project. One form for each lot is not necessary.

## Specific Instructions

### Basis of Request

Select the type of MT-1 Letter of Map Change (LOMC) being requested, by checking only one box. Next to each type of LOMC a brief definition has been provided to assist the requester in making an informed selection.

### Fill Placement

**Fill** is defined as material from any source (including the subject property) placed that raises the ground (natural grade) to or above the Base (1%-annual-chance) Flood Elevation (BFE). The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing (natural grade) elevation, which is at or above the BFE. **Fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in a Special Flood Hazard Area is considered natural grade. The Special Flood Hazard Area (SFHA) is the area that would be inundated by the base flood.** Assistance to ascertain if fill has been placed on your property may be available from the community official or agency responsible for floodplain management. You may consult with the community map repository to obtain previous editions of the NFIP map, archived topographic data, or permit drawings related to construction on the site. If the structure footprint is located on ground higher than the surrounding area, fill may have been placed. Additional sources for assistance would include the developer or engineer/designer of the subdivision, previous owners of the site, persons who have owned or resided on adjacent parcels, and large-scale aerial photographs (check the tax assessor's office). In addition, digital copies of historic NFIP maps may be available on DHS-FEMA's Map Service Center (MSC), for a nominal fee. To place orders from the MSC, interested parties may visit the MSC website at <https://msc.fema.gov/portal>. For additional information



regarding historic maps, interested parties may contact the DHS-FEMA Mapping and Insurance eXchange toll free, at 1-877-FEMA MAP (1-877-336-2627).

Regardless of the type of LOMC being requested, DHS-FEMA must require the requester to clearly state, to the best of his or her knowledge, whether fill was or was not placed on his or her property. The requester must select either "yes" or "no." If fill was placed on the property, the requester must provide the month and year fill was placed.

In addition, for proposed projects, DHS-FEMA requires the requester to clearly state whether fill will be placed on his or her property. If fill will be placed, the requester must provide the month and year fill will be placed. In addition, the applicant must then provide documentation to show that ESA compliance has been achieved. Additional information about these requirements is available on Page 4 of this instruction packet.

### **Number 1 - Street Address**

Enter the street address (911 type) for the structure or property being reviewed (subject property). For requests involving multiple lots, structures, or units, attach a separate piece of paper including all street addresses when space is insufficient.

### **Number 2 - Legal Description**

Describe the property by referring to the Deed or Plat Map. The description may consist of a lot number and subdivision name, a parcel number, a tract number, or any other information provided in the Deed or Plat to identify the property (e.g., Lot 2, Block 1, Floodville Estates). It is not necessary to reproduce a lengthy description of the property as it appears in the Deed.

### **Number 3 - Subject of Determination**

DHS-FEMA makes determinations on parcels of land or structures. The requester should select structure, portion of a parcel, or a parcel of land. If the request is for a structure on a property, the date of construction must be provided in this section. Date of construction information may usually be obtained from real estate settlement documents, the property developer, or the local government office where real estate and/or land development transactions are recorded. If there is more than one structure on a property, attach a separate piece of paper with the dates of construction. If the request is for a portion of a parcel, a certified metes and bounds description and map of the area to be removed, certified by a licensed land surveyor or registered professional engineer, are **required**. The metes and bounds description must cover the specific area to be removed, and it must be tied to an identifiable starting point. If the description is for a legally recorded lot or parcel, the metes and bounds description should commence or begin at the lot or parcel corner. Metes and bounds descriptions must not intersect or coincide with the footprint of an existing structure. Please see the example below for the preferred format of metes and bounds descriptions.

BEGINNING at the northeast lot corner; thence S16°42'22"E, 100.00 feet; thence S33°14'40"W, 145.92 feet; thence S89°13'29"W, 156.01 feet; thence N16°42'22"W, 223.14 feet; thence 210.49 feet along a curve to the left having a radius of 542.00 feet to the POINT OF BEGINNING

DHS - FEMA encourages the submission of metes and bounds descriptions in digital format on CD. This may help expedite the processing of your request.

### **Number 4 - Number of Structures or Properties**

DHS-FEMA makes determinations on single or multiple, lots (parcels of land) or structures. Select the choice that best describes your request.

### **Required Data**

All requests must include the following data:



- Property description documentation must be enclosed for every request and will consist of either the Plat Map or Deed (containing the recorder's stamp and recordation date) accompanied by a tax assessor's map or other suitable map showing the surveyed location of the property. The recordation data (e.g., Book, Volume, Page, Reel, Document Number, and Date) must be evident on the copies of these documents so that DHS-FEMA may use the legal description of the property. In addition, DHS-FEMA must be able to identify the property exactly. If the property is not recorded on a Plat Map, a copy of a tax assessor's map or other suitable map must be submitted to aid DHS-FEMA in locating the property. The map should include at least one street intersection that is shown on the FIRM panel.
- A photocopy of the effective FIRM panel, annotated to show where the property is located, must be submitted for every request. If your community has a separate Flood Boundary and Floodway Map (FBFM), please include a copy. The panel number and effective date of the FIRM must appear on the copy submitted. The actual map or a photographic copy must be used.
- The Elevation Form (Form 2) must be included for all requests, **except** requests for determinations in which the FIRM already shows the property to be CLEARLY outside the SFHA. For cases in which the determination for the property or structure is uncertain, elevation data must be submitted to provide a definitive determination. This form must be completed by a licensed land surveyor or registered professional engineer. If an NFIP Elevation Certificate has been completed for a structure, it may be submitted in lieu of this form. The Elevation Certificate must be certified by a licensed land surveyor or registered professional engineer.
- The Community Acknowledgment Form (Form 3) must be included for all LOMR-F or CLOMR-F, or for LOMA requests in which the property has been inadvertently included within the NFIP regulatory floodway. For LOMR-F and CLOMR-F requests only Section A needs to be completed. For LOMA requests in which the property has been inadvertently included within the regulatory floodway, only Section B needs to be completed (see INSTRUCTIONS FOR COMPLETING OPTIONAL FORMS of these instructions for additional information on the certification requirements of this form).
- Documented ESA compliance must be submitted for CLOMR-Fs only. Appropriate documentation includes a copy of an Incidental Take Permit, an Incidental Take Statement, a "not likely to adversely affect" determination from NMFS or USFWS, or an official letter from NMFS or USFWS concurring that the project has "No Effect" on proposed or listed species or designated critical habitat. Additional information about these requirements is available on Page 4 of this instruction packet.

## Review and Processing Fee

The appropriate review and processing fee must be submitted for requests involving proposed projects and for requests involving the placement of fill (e.g., CLOMA, LOMR-F, or CLOMR-F). The Payment Information Form should be included with the processing fee. No fee is required to obtain a determination based on existing conditions (i.e., LOMA) as long as no fill has been placed. For the current fee schedule visit DHS-FEMA's Flood Map-Related Fees Internet site: <https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees>.

## Signature

The requester must provide his or her name, mailing address, and telephone number. The requester must also sign and date, where indicated, to certify the accuracy of the information provided. A Licensed Land Surveyor, Registered Professional Engineer, or other designated agent may sign this form for the requester if they are submitting on their behalf. Providing an email address is optional, however, providing one will make it easier for DHS-FEMA to contact you if necessary and may facilitate the processing of your request.



# INSTRUCTIONS FOR COMPLETING THE ELEVATION FORM (FORM 2)

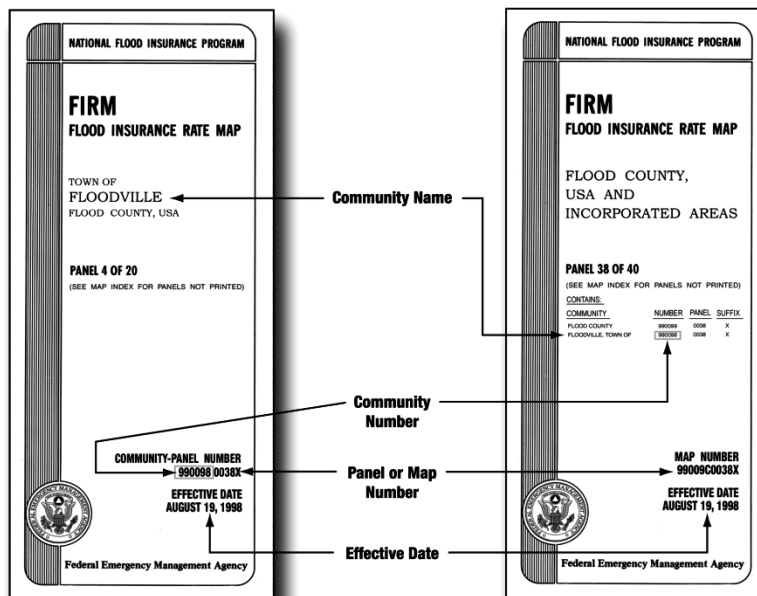
## General Instructions

The Elevation Form (Form 2) must be completed by a licensed land surveyor or registered professional engineer (authorized by law to certify the information requested). If the request is to make a determination on the structure, and an NFIP Elevation Certificate has already been completed for this property, it may be submitted in lieu of this form. If the request is to make a determination on the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2. If the request is to have the SFHA designation determined for the entire legally recorded property, but the only elevation provided is the Lowest Adjacent Grade to Structure, the determination will be issued for the structure.

For a licensed land surveyor or registered professional engineer to complete this form, it will be necessary to obtain the effective Flood Insurance Rate Map (FIRM) panel, effective Flood Boundary and Floodway Map (FBFM) panel (if printed), and Flood Insurance Study (FIS) report that cover the area in which the property is located. These can be obtained from the community map repository or may be available from the Map Service Center (MSC). Interested parties may visit the MSC website at <https://msc.fema.gov/portal> or contact the DHS-FEMA Mapping and Insurance eXchange by calling 1-877-FEMA MAP (1-877-336-2627). Surveyors and engineers who do not have Internet access should contact the DHS-FEMA Mapping and Insurance eXchange by calling 1-877-FEMA MAP (1-877-336-2627).

## Number 1 - Community Number

Provide the six-digit NFIP community number as it appears in the Title Block of the FIRM panel. In addition, include the name of the property (i.e., legal description) and/or the property's address.



For additional information on reading FIRM panels you may consult the tutorial "How to Read a FIRM" on DHS-FEMA's Internet site: <https://www.fema.gov/sites/default/files/2020-07/how-to-read-flood-insurance-rate-map-tutorial.txt>.

\*Please note that, in some communities, the only NFIP maps available may be Flood Hazard Boundary Maps, instead of FIRMs.

## Number 2 - Conditionals

Identify whether the elevations being provided are based on existing or proposed conditions.



### Number 3 - Type of Construction

If the request involves or will involve a structure, provide the type of construction.

**Crawl Space** – The bottom floor is below the first floor, is enclosed by solid and partial perimeter walls, and may be above ground level (grade) on one or more sides. Spaces below ground level on all sides must meet the requirements of FEMA Technical Bulletin 11-01. Spaces with a bottom floor elevation more than 2.0 feet below the Lowest Adjacent Exterior Grade (LAG) elevation will be classified as a basement.

**Slab on Grade** – The bottom floor is at or above ground level (grade) on at least one side.

**Basement/Enclosure** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides. See Crawl Space above.

**Other** – All other structure types not listed above including, but not limited to split levels, structures on piers, mobile homes, etc. Please be as detailed as possible.

### Number 4 - Elevation Datum

Provide the elevation datum (e.g., NGVD 29, NAVD 88, or other specified) for which the property elevations shown on the form are referenced. If the datum being referenced is different than the datum used to produce the effective FIS, please provide the datum conversion. Please note that mean sea level datum (MSL) is used within the Commonwealth of Puerto Rico and local tidal datum (LTD) is used within the U.S. Virgin Islands.

### Number 5 - Geographic Coordinate Data

The surveyor or engineer must provide the latitude and longitude of the property in decimal degrees to the 5th decimal place (00.00000), and indicate the appropriate horizontal datum, WGS84, NAD83, or NAD27.

### Number 6 - Subsidence or Uplift

Land subsidence is the lowering of the ground as a result of water, oil, gas extraction, as well as other phenomena such as soil compaction, decomposition of organic material, and tectonic movement. Periodically, the National Geodetic Survey re-levels some benchmarks to determine new elevations above the National Geodetic Vertical Datum of 1929 (NGVD 29) or above the North American Vertical Datum of 1988 (NAVD 88); however, not all benchmarks are re-leveled each time.

Check “yes” if the area of the property is in an area of subsidence or uplift, and provide the date of the current re-leveling; check “no” if the area of the property is not in an area of subsidence or uplift. In areas experiencing ground subsidence (e.g., Harris County, Texas, and Incorporated Areas); the most recently adjusted Elevation Reference Mark (ERM) must be used for accurate ground and structure elevations. Please consult the effective Flood Insurance Study (FIS) for your community or local floodplain administrator for the most current ERM data.

In general, the effects of subsidence can be accounted for by determining grade and structure elevations using benchmark elevations with the same re-level date as the benchmarks used to develop the Base (1%-annual-chance) Flood Elevations (BFEs) on the FIRM. Please be aware that benchmark re-level dates can be different for different flooding sources. No adjustment is necessary to the BFEs on the FIRM.

### Elevation Table

A row in the elevation table must be completed for each property (parcels of land or structures) involved in this request (subject property).

**Address** – Provide the street address (911 type) for subject property.

**Lot/Block Number** – Provide the property’s lot and/or block number if available. In the absence of a lot or block number, the registered professional engineer or licensed land surveyor must include an identifier that clearly states for what the elevations are being referenced (e.g., residential structure, commercial building, unit 1, etc.).



**Lowest Lot Elevation** – For requests involving property, or a portion thereof, provide the lowest lot elevation to the nearest tenth (0.1) of a foot or meter. If the FIRM shows BFEs in meters, the accuracy of the lowest lot elevation must be to the nearest tenth of a meter. If the BFE varies across the property, please provide a certified site plan showing the range of elevations across the property.

**Lowest Adjacent Grade (LAG) to the Structure** – For requests involving a structure, provide the LAG elevation (the elevation of the lowest ground touching the structure including attached patios, stairs, deck supports or garages), to the nearest tenth (0.1) of a foot or meter. If the FIRM shows BFEs in meters, the accuracy of the LAG elevation must be to the nearest tenth of a meter.

**Base Flood Elevation** – Provide the BFE affecting the property. FEMA will verify the BFE during the review process. BFEs can be obtained by locating the property on the effective FIRM for the community in which the property is located. Upon locating the property on the FIRM, the engineer or surveyor should determine the type of flooding and in which flood zone the property is located. The summary below will provide direction for how to determine the BFE as a result of the flooding type and flood zone determination.

**Base Flood Elevation Source** – Provide the source used in determining the BFE (e.g., FIRM, profile, floodway data table, Community Determined, or other source). When submitting a BFE that is either community determined or from an alternate source, please include in the request, sufficient data that supports the BFE.

- **Riverine Flooding Systems (Zones AE or A1-A30)** – Consult the FIS report for the community in which the property is located. Next, locate the flood profile for the flooding source by name. Estimate the property's location along the flood profile and interpolate the BFE using the 100-yr. flood profile line.
- **Lacustrine (Stillwater) Flooding Systems** – Consult the FIS report for the community in which the property is located. Next, locate the Summary of Stillwater Elevations table. Locate the flooding source, by name, and use the BFE listed in the table. The flooding source's BFE is normally shown to the nearest one-tenth of a foot. If the flooding source is not listed in the "Summary of Stillwater Elevations" table, use the BFE as shown on the FIRM.
- **Coastal Flooding Systems (Zones AE or A1-A30 and VE or V1-V30)** – Obtain and use the whole foot BFE from the effective FIRM Panel. **(Any structure/parcel of land located seaward of the landward toe of the primary frontal dune may not be removed from a Zone VE or V1-V30.)**
- **Zone A Flooding** – If the property is located in a Zone A, an area of approximate flooding with no BFEs determined, a BFE will need to be determined by the engineer or surveyor. First, the engineer or surveyor should determine if a Federal, State, or local government agency has developed a BFE. Such agencies include the U.S. Army Corps of Engineers, the U.S. Geological Survey, the State's Department of Natural Resources, Department of Environmental Quality, or Department of Transportation; or the local Planning and Zoning Department. If one has been developed, all supporting data and calculations used to develop the BFE must be submitted, or a letter directly from the government agency must be submitted. If a BFE has not previously been developed, the engineer or surveyor should consult DHS-FEMA 265, *Managing Floodplain Development in Approximate Zone A Areas: A Guide for Obtaining and Developing Base (100-year) Flood Elevations*, available online at [https://www.fema.gov/sites/default/files/documents/fema\\_approx-zone-a-guide.pdf](https://www.fema.gov/sites/default/files/documents/fema_approx-zone-a-guide.pdf). This publication is an excellent resource, which details the appropriate methods for determining BFEs in SFHAs designated flood zone A. To obtain additional information about developing BFEs, contact the DHS-FEMA Map Information eXchange at 1-877-FEMA MAP (1-877-336-2627). If the property is greater than 50 lots or 5 acres, whichever is the lesser, the engineer or surveyor must determine a BFE as a provision of Part 60.3(b)(3), which is available online at <https://www.govinfo.gov/content/pkg/CFR-2012-title44-vol1/pdf/CFR-2012-title44-vol1-sec60-3.pdf>.
- **Shallow Flooding (Zone AH)** – If the property is located in flood zone AH, locate the Summary of Stillwater Elevations table in the FIS report. Identify the flooding source, by name, and use the BFE listed in the table. If no Summary of Stillwater Elevations table exists, use the BFE shown on the FIRM. If different elevations appear within the same SFHA, the BFE is obtained by linear interpolation between two adjacent BFE lines.



- **Shallow/Sheet Flooding (Zone AO)** – For a property located in Zone AO, the characteristics of the Zone AO area shown on the NFIP map will determine the appropriate methodology to be used to develop the BFE for the property. If the flooding is conveyed by the street, provide the highest top of curb or crown of street elevation (whichever is higher) along the property line and add this to the depth of flooding. The lowest adjacent grade elevation must be above the curb or street elevation by an amount equal to or greater than the depth of flooding shown on the NFIP map. If the entire property is inundated by the SFHA and the flow is not conveyed by the street, add the depth of flooding to the average surrounding grade. If the property is partially inundated by the SFHA and the street does not convey the flow, add the depth of flooding to the lowest lot elevation. Along with the information required for one of the above-mentioned methods, provide sufficient certified topographic information, including flow paths, to show that the structure is located on high ground relative to the depth indicated on the NFIP map.

If the request involves multiple properties (parcels of land or structures), elevations must be provided for each property. If the number of properties for which DHS-FEMA is to make a determination exceeds the number of rows on the Elevation Table, additional photocopies of the table may be attached to the back of the Elevation Form.

### **Certification (by a licensed land surveyor, registered professional engineer, or architect)**

The certifier must provide his or her name, license number and expiration date, his or her company name, telephone number and, if applicable, his or her fax number and email address. The certifier's seal, if available, may be provided here. The certifier must sign and date the Elevation Form, where indicated, to certify the accuracy of the information provided. Not all states authorize architects and engineers to certify elevation information. Consult the state board of registration for more information.



## INSTRUCTIONS FOR COMPLETING OPTIONAL FORMS

### General

While Forms 1 and 2 must be completed for all requests, Form 3 must only be completed when applicable. Instructions for completing this form are provided below.

### Community Acknowledgment Form (Form 3)

The Community Acknowledgment Form (Form 3) must be completed for all requests involving the placement of fill, existing or proposed, or requests for land or structures that are inadvertently included in the NFIP regulatory floodway. The form must be completed and signed by the community official responsible for floodplain management in the community. The community name and the subject property address shown in Items 1 and 2 of the Property Information Form must appear in the spaces provided. Space has been provided within each section for the community official to provide comments on the project (e.g., Section A - The project is reasonably safe from flooding and satisfies Parts 60.3 and 65.5 of the NFIP regulations. Section B - Removal of the project from the regulatory floodway will not result in an increase in Base Flood Elevations.). If additional space is required by the community official to provide the community's comments on a project, additional sheets may be attached to the back of this form.

### Section A – Requests Involving the Placement of Fill

#### Instructions for Communities:

As a participant in the NFIP under 44 CFR 60.3(a)(2), you are required to ensure, prior to issuing a floodplain development permit, that an applicant is in compliance with local and NFIP regulations and has obtained all necessary Federal and State permits related to development. For CLOMR-F requests, applicants must document ESA compliance to FEMA prior to issuance of the CLOMR-F determination. For LOMR-F requests, ESA compliance is required independently of FEMA's process. The community must ensure that appropriate ESA permits are obtained per requirement under Section 60.3(a)(2) of FEMA's regulations. Additional information about these requirements is available on Page 4 of this instruction packet. Another common Federal permit requirement may include wetland permits under Section 404 of the Clean Water Act of 1972. If you need a wetlands permit or are not sure if one is required, contact your local U.S. Army Corps of Engineers District Office. Necessary State permits vary depending on the State.

#### Instructions for Applicants:

You are responsible for obtaining all necessary Federal, State, and local permits as a condition of obtaining a LOMR-F or CLOMR-F. Your community is required to verify that you have obtained these necessary permits prior to issuing a floodplain development permit or signing the Community Acknowledgment Form (MT-1 Form 3). In addition, for CLOMR-F requests, you must document to FEMA that ESA compliance has been achieved prior to issuance of the CLOMR-F determination. For LOMR-F requests, ESA compliance is required independently of FEMA's process. Your community must ensure that appropriate ESA permits are obtained per requirement under Section 60.3(a)(2) of FEMA's regulations. Additional information about these requirements is available on Page 4 of this instruction packet. Another common Federal permit requirement may include wetland permits under Section 404 of the Clean Water Act of 1972. If you need a wetlands permit or are not sure if one is required, contact your local U.S. Army Corps of Engineers District Office. Necessary State permits vary depending on the State.

To assist communities in determining if a property or structure, existing or proposed, is reasonably safe from flooding, DHS-FEMA has published Technical Bulletin 10-01. This bulletin outlines safe building practices, which when followed, may reduce the risk of flood damage to a property or structure. Community Officials interested in obtaining copies of this bulletin should visit our Internet site at [https://www.fema.gov/sites/default/files/2020-07/fema\\_tb10\\_ensuring\\_structures.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_tb10_ensuring_structures.pdf). Community Officials that do not have Internet access should contact the FMIX toll free at 1-877-FEMA MAP (1-877-336-2627).



All inquiries regarding these, or other NFIP regulations, should contact the FMIX for assistance.

### **Section B – Property Located within the Regulatory Floodway**

Required for all requests that are inadvertently included in the regulatory floodway. The regulatory floodway is the area of the Special Flood Hazard Area that must remain unobstructed in order to prevent unacceptable increases in Base Flood Elevations. This form must be signed by a community official, responsible for floodplain management, to acknowledge the community's acceptance of a revision to the regulatory floodway within the community.





# Guidance for Flood Risk Analysis and Mapping

MT-1 Technical Guidance

November 2021



**FEMA**



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Requirements for the Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) Program are specified separately by statute, regulation or FEMA policy (primarily the Standards for Flood Risk Analysis and Mapping). This document provides guidance to support the requirements and recommends approaches for effective and efficient implementation. Alternate approaches that comply with all requirements are acceptable.

For more information, please visit the FEMA Guidelines and Standards for Flood Risk Analysis and Mapping webpage (<https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards>). Copies of the Standards for Flood Risk Analysis and Mapping policy, related guidance, technical references and other information about the guidelines and standards development process are all available here. You can also search directly by document title at [www.fema.gov/multimedia-library](http://www.fema.gov/multimedia-library).



## Table of Revisions

The following summary of changes details revisions to this document subsequent to its most recent version in December 2020.

Affected Section or Subsection	Date	Description
Sections 2.2, 2.4, 3.1, 3.3, 3.4, 3.5, 4.0 and 4.1	November 2021	Incorporated additional detail regarding the limitations of the MT-1 process, corrected typographical errors, and added additional special processing situations.



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# 1. Introduction

The purpose of this document is to explain how the Department of Homeland Security, Federal Emergency Management Agency (FEMA) makes determinations or provides comments regarding the flood hazard zone for a lot, a portion of a lot, or an existing or proposed structure. The lot or structure is considered the subject of the determination (subject).

The regulations governing the processing of these determinations and comments are presented in Title 44, Chapter 1 of the Code of Federal Regulations (CFR), Parts 65 and 70, available online [through the Federal Government's e-CFR site](#).

Many terms associated with the MT-1 process have specific definitions related to the National Flood Insurance Program (NFIP) and the MT-1 application process. These key terms can be found in the Glossary (Section 6.0).

## 2. Overview of the MT-1 Process

Through the MT-1 process, a property owner or authorized representative may request a property-specific determination or comment regarding the flood hazard designation for as-built or proposed development. MT-1 determinations amend the community's effective Flood Insurance Rate Map (FIRM) by clarifying whether the subject is within the Special Flood Hazard Area (SFHA). MT-1 comments provide feedback on whether proposed development, if completed exactly as proposed, would be within the effective SFHA upon completion of the project. During the review, FEMA considers the horizontal location of the subject on its community's effective FIRM and allows for detailed property elevation data to be submitted and compared to the calculated Base Flood Elevation (BFE). All requests are processed on a first come first served basis upon receipt of all data required for the review.

### 2.1. Determining Eligibility for the MT-1 Process

The MT-1 process can only be completed using a community's effective FIRM and Flood Insurance Study (FIS) report (see FEMA Policy 204-078-1 Standard ID 218, [https://www.fema.gov/sites/default/files/documents/fema\\_flood-risk-analysis-and-mapping-policy\\_rev11.pdf](https://www.fema.gov/sites/default/files/documents/fema_flood-risk-analysis-and-mapping-policy_rev11.pdf)), and it does not result in physical changes to an effective FIRM. If the subject of a request has either caused or been affected by significant SFHA or BFE changes, the Letter of Map Revision (MT-2) process may need to be completed first to allow due process and for the changes to be officially incorporated into the effective FIRM. Application forms for the MT-2 process can be found on the FEMA website at <https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2>.

The MT-1 process shall not be used for requests involving:

- Changes to BFEs or SFHA boundaries including:



- Creation of ponds or basins, including the creation of interconnected ponds that significantly modify the mapped drainage as shown on the effective FIRM.
- Relocation or elimination of a channel or other drainage/watercourse as shown on the effective FIRM.
- Elimination of a mapped SFHA, or portion thereof, that results in a disconnected SFHA with no apparent conveyance for the drainage as shown on the effective FIRM.
- Appeals to flood information shown on either a preliminary FIRM or the current effective FIRM. Appeals should be submitted through the local community who will review the request and, if acceptable, will forward the request to the FEMA regional office.
- Changes to the boundary delineations for a regulatory floodway or any development in the regulatory floodway that may cause a change (increase or decrease) to the BFE or boundaries of the regulatory floodway, including compensatory storage, excavation, new ponds, drainage improvements and the placement of any fill material.
  - The review or acceptance of a No-Rise or No-Impact Certification is outside of the scope of the MT-1 process.
  - As per 44 CFR 65.3, any physical change that may cause an increase or decrease in a BFE.
  - Requests of this type must be reviewed under the MT-2 process.
- Channelization projects, bridge/culvert replacement projects, other flood control improvements, or any manmade changes intended to provide flood protection.
- Changes to a Coastal High Hazard Area (CHHA), such as attempting to change an SFHA designation from Zone V to Zone A.
- Fill placement in a CHHA.
- Property and/or structures in alluvial fan flood hazard areas.
- New technical data or mapping errors that warrant a revision to the effective FIRM and FIS report.
- Review of any Conditional Letter of Map Revision based on Fill (CLOMR-F) or LOMR-F for an existing or proposed landfill site.

An MT-1 applicant should work closely with their local community, specifically the designated floodplain administrator or manager, to determine whether the MT-1 process is appropriate for review of specific projects. An MT-1 request is not a permit and should not be used to attempt to bypass the local permitting process and all other necessary federal, state and local reviews and approvals.



## 2.2. Types of MT-1 Requests

Two types of MT-1 requests may result in a Letter of Map Change (LOMC) *determination* document; two may result in a *comment* document.

### 2.2.1. DETERMINATIONS

- Letter of Map Amendment (LOMA): a request for a determination from FEMA for a lot or existing structure that has NOT been elevated by fill (natural grade).
- Letter of Map Revision based on Fill (LOMR-F): a request for a determination from FEMA for a lot or existing structure that HAS been elevated by fill.

Some MT-1 determinations are not the result of specific requests but are types of unique LOMA determinations that FEMA can issue. FEMA issues a Letter of Map Revision Floodway (LOMR-FW) when the subject has been inadvertently mapped within a regulatory floodway. The subject of a LOMR-FW determination must be located on natural ground (no fill), with either the Low Lot Elevation (LLE) for a lot or portion of a lot or the Lowest Adjacent Grade (LAG) elevation for a structure at or above the BFE. A LOMR-FW response will be processed for a subject within an effective regulatory floodway if the fill was placed in an SFHA prior to the first identification of the regulatory floodway. However, if the fill was placed in a regulatory floodway designated on a preliminary FIRM after the issuance of the Letter of Final Determination, that request will be subject to special review procedures and may be determined to be a potential violation of 44 CFR 60.3(d)(3).

FEMA issues a Letter of Map Revision V Zone (LOMR-VZ) when the subject has been inadvertently mapped within a CHHA (V zone). The subject of a LOMR-VZ must be located on natural ground (no fill), with either the LLE (for a lot or portion of a lot) or the LAG elevation for a structure at or above the BFE.

### 2.2.2. COMMENTS

- Conditional Letter of Map Amendment (CLOMA): a request for a conditional determination (comment) from FEMA for a proposed structure that will NOT be elevated by fill (natural grade). Requests require both a proposed LAG and a certified location for the proposed structure. Note: Requests for FEMA's comment on existing land will be processed as an as-built determination (LOMA) for either the entire recorded property or a portion of the legally recorded property if a metes and bounds description and map are submitted (see Sections 3.4 and 4.8 for more details on requests based on a metes and bounds description and map).
- Conditional Letter of Map Revision based on Fill (CLOMR-F): a request for a conditional determination (comment) from FEMA for a lot or proposed structure that WILL be elevated by fill.
- In addition to ensuring that existing projects are compliant with NFIP regulations, a compliance review is also completed for all proposed projects. If the submitted data indicate that the proposed project will not be compliant with the minimum requirements set forth in 44 CFR 60.3,



the applicant may be required to revise the project plans prior to FEMA issuing a CLOMA or CLOMR-F comment document.

- Conditional LOMC comments issued by FEMA are not permits and should not be considered approval that all local requirements have been met, such as the higher floodplain management standards that have been adopted by many communities.

Conditional LOMCs are subject to the same standards as LOMCs for as-built conditions (LOMAs or LOMR-Fs) except:

- Because Conditional LOMCs are based on proposed construction, as-built information is not required.
- The Conditional comment documents that are issued do not amend the effective NFIP map.
- CLOMR-Fs must demonstrate to FEMA their compliance with the Endangered Species Act.(Refer to Section 3.3)

Please see FEMA Policy 204-078-1 SID 215 at

[https://www.fema.gov/sites/default/files/documents/fema\\_flood-risk-analysis-and-mapping-policy\\_rev11.pdf](https://www.fema.gov/sites/default/files/documents/fema_flood-risk-analysis-and-mapping-policy_rev11.pdf).

### 2.2.3. REQUESTS FOR SINGLE VS. MULTIPLE SUBJECTS

MT-1 requests may be made for single or multiple structures, lots or portions of property. Only submittals for coincident properties will be treated as one case. If they are not coincident, each property will be processed as a separate case and will be subject to the necessary data requirements, including any applicable review fee. To be considered coincident, properties must be adjacent to one another, contained within the same deed or plat map, and affected by the same flooding source. Requests for property or a portion of property affecting more than one existing or proposed lot or parcel of land will be treated as a multiple-lot case and subject to any applicable multiple-lot review fee.

Table 1 contains additional details defining what is considered a single or a multi-lot request.

**Table 1: Single Lot or Multi-lot Request**

If the subject of the determination is to evaluate:	Fee
Single lot (in its entirety) with multiple structures	Single Lot Fee
Single metes and bounds area with multiple structures on a single lot	Single Lot Fee
Multiple structures on a single lot	Multiple Lot Fee



If the subject of the determination is to evaluate:	Fee
Multiple metes and bounds areas on a single lot	Multiple Lot Fee
Single metes and bounds area intersecting or encompassing multiple lots (existing or proposed lots)	Multiple Lot Fee

## 2.3. How to Apply

MT-1 requests may be initiated either by submitting an online request or by mailing the appropriate application form(s) and supporting documentation.

### 2.3.1. APPLICATIONS AND FORMS

- The MT-1 Application, which may be used for all types of MT-1 requests, can be found online at <https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1> and includes the following:
  - Form 1 – Property Information Form.
  - Form 2 – Elevation Form.
  - Form 3 – Community Acknowledgment Form.
  - Form 4 – Payment Information Form.
- The MT-EZ Application, found online at <https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-ez>, may be used for a single residential lot or structure. It cannot be used for conditional requests, requests submitted by developers, requests involving multiple structures or lots, property located within the regulatory floodway, or requests involving the placement of fill. It includes the following:
  - Section A – Property Information Form.
  - Section B – Elevation Information Form.

### 2.3.2. ONLINE REQUESTS

- The Online LOMC tool, available at [hazards.fema.gov/femaportal/onlinelomc/signin](https://hazards.fema.gov/femaportal/onlinelomc/signin), generates the equivalent of a Property Information Form. All other forms (MT-1 or MT-EZ, as appropriate) and required data must be uploaded with the application.



- The electronic LOMA (eLOMA) tool was designed specifically to allow registered Licensed or Certified Professionals to generate a determination. More information about eLOMA is available on FEMA's Mapping Information Platform at [hazards.fema.gov](https://hazards.fema.gov).

## **2.4. Determination and Comment Outcomes**

An MT-1 review will result in one of the following outcomes: removal, non-removal, or out as shown. Additionally, some requests may result in an Informational or No Change Response Letter that explains why the review could not be completed.

### **Removal**

- For determination documents, a removal outcome indicates that the SFHA designation has been removed from the subject of the determination. Removal determination documents normally do not list the calculated BFE used for the determination.
- For comment documents, a removal outcome indicates that if the as-built development is completed as described before the effective FIRM is revised, the subject of the determination will not be within the SFHA.

### **Non-Removal**

- For determination documents, a non-removal outcome indicates that the subject of the determination remains within the SFHA.
- For comment documents, a non-removal outcome indicates that if the as-built development is completed as described before the effective FIRM is revised, the subject of the determination will remain within the SFHA.

### **Out as Shown**

- For determination documents, an out-as-shown outcome indicates that the subject of the determination is not mapped within the SFHA on the effective FIRM.
- Out-as-shown comment documents are not normally issued for a conditional out-as-shown request (CLOMA-OAS). Rather, the requester is usually asked to provide a metes and bounds description and map for the property, or a portion of the property, containing the area of the proposed structure(s). The request is then processed as a LOMA. .

### **Informational Response Letters**

- Due to the nature of the request, it must be processed as a Conditional Letter of Map Revision (CLOMR) or a Letter of Map Revision (LOMR).
- The subject of the determination is in Zone D, an area of possible but undetermined flood hazards.



- The community has not signed the required Community Acknowledgement Form, a requirement for a CLOMR-F, LOMR-F, or LOMR-FW.
- The subject of the determination is within a CHHA designated Zone V, with no established BFE.
- The subject of the determination is in a CHHA and in an area subject to erosion, or it is in violation of a CHHA regulation.
- A LOMR-FW, LOMR-F or CLOMR-F cannot be processed because the community does not participate in the NFIP.
- The request is for a CLOMR-F or LOMR-F for the area of a proposed or existing landfill site. Landfill sites normally have large amounts of fill, no insurable buildings, and are subject to multiple other federal, state and local review and permitting.
- No SFHAs have been identified for the area of the request or the FIRM panel is not printed because the area of the panel is one flood zone.

#### **No Change Response Letters**

- An existing determination for the subject is still valid.
- The subject is currently included as valid on a revalidation letter for the community.

#### **2.4.1. SPECIAL WORDING IN MT-1 DETERMINATION AND COMMENT DOCUMENTS**

Standard wording options known as “Additional Considerations” can be added to a determination or comment document. These options do not in any way make or modify a determination or comment in the Outcome section of the document. The wording options are included to clarify special situations pertaining to the community, to cite the data used in the determination, or to provide additional information on specific conditions pertaining to the property or a portion of the property.

In addition to providing any standard wording that may apply to a request, the Additional Consideration section may be used when the legal property description is continued or when the determination document table is continued:

- *Legal Property Description (Continued)* is used when the legal property description is too long to fit on Page 1. This is normally required for metes and bounds requests, which can have lengthy descriptions. The legal property description is continued on the following page(s) of the document.
- *Determination table (Continued)* is used when there is more than one subject of determination for the request. The determination table is continued on the following page(s) of the document.



### 3. MT-1 Supporting Data Requirements

Specific application forms are required to initiate an MT-1 request, and additional data must be submitted to complete the application. While the items listed in this section fulfill the requirements for most MT-1 requests, other data may be required to provide clarity before the review can be completed. Extensions for additional time to submit the required data are not normally approved and applications are processed on a first come first served basis from the time all of the required data are received. More information regarding the application forms and the data required for an MT-1 request can be found on the web at [www.fema.gov/change-flood-zone-designation-online-letter-map-change](http://www.fema.gov/change-flood-zone-designation-online-letter-map-change).

Please note that an exhaustive review of each MT-1 request is not performed until all required data items have been received for review. Because of this, additional data may be required after the initial data items have been reviewed. Subsequent data requests may be related to new information that is provided, or when additional clarity is needed regarding the data received in response to an additional data request.

#### 3.1. General Data Requirements

One set of data is required for all MT-1 requests. In general, the required data provide five essential pieces of information:

1. Requester information, with a signed/dated request.
  - MT-1 Property Information Form (Form 1).
  - MT-EZ Property Information Form (Section A).
  - Completed Online LOMC or eLOMA request (signature not needed).
2. Recorded legal document that includes a description of the property.
  - Recorded property deed; all pages must be submitted.
  - Recorded master condominium deed for requests involving condominiums.
  - Recorded plat map.
  - Must include a recordation date and legible recording information, such as Book/Volume and page numbers and/or Document/Instrument number.
  - Usually obtained from the County/Parish Clerk or Recorder/Register of Deeds office for the community.
3. Subject(s) of the determination (structure, lot, or portion of property).
  - Provided on Property Information Form.



- Entered into the Online LOMC or eLOMA portals.

Note: If a request is submitted for an entire legally recorded property or a portion of property, but the request includes only the elevations for a structure, a determination/comment will be evaluated for only the structure.

4. Map and address information sufficient to accurately and efficiently verify the location of the property and any structure(s) on the property.

- Tax Assessor's Map.
- Certified plat of survey or other suitable structure location map.
- Certified survey of structure location for proposed structures.
- Must show at least one street intersection that is also shown on the FIRM.
- Must have a north arrow and scale for reference.

5. Certified elevation information

- Needed for most determinations/comments.
  - Please note that if a change is made to elevations previously submitted to FEMA, all changes must be accompanied by a clear explanation for the change(s) and must be certified by a licensed professional eligible to collect and certify elevation information within their state.
6. All forms must be completed in their entirety. No portion of a form shall be left incomplete and adding "see attached" is normally not acceptable. For instance, a brief legal description and address are required on the Property Information Form and a continuation can be used where necessary, but do not leave any question or portion of a form blank or only containing "see attached."

### **3.2. Elevation Data Requirements**

All MT-1 requests require elevation information for the subject EXCEPT requests where the subject is clearly shown entirely outside of the SFHA on the effective FIRM. All elevation information submitted to support an MT-1 request must be certified by a licensed professional eligible to collect and certify elevation information within their state, usually a Professional Engineer or Licensed Land Surveyor. If there is any uncertainty regarding eligibility, the state licensing board should be contacted for verification.

In lieu of field surveyed elevation data, it may be possible to make use of available Light Detection and Ranging (LiDAR) data. Please see Section 5.0 for additional details for the use of LiDAR data.



Elevation data requirements may include the following items:

- Elevation Form (Form 2, MT-1 Application)
- MT-EZ Application Form (Section B)
  - Can only be used for an existing single residential lot or structure.
- Elevation Certificate
  - Can only be used for a single structure, existing or proposed.
- Certified Topographic Survey Map
  - May be required when the elevation data on a form does not provide enough detail to complete the review.
- Certified Grading Plan
  - Normally required when fill is being placed on a property in the vicinity of the floodway or in the vicinity of a CHHA.

The following list includes additional considerations related to elevation data requirements:

- Elevation data must be provided to an accuracy of one-tenth of a foot.
- With the exception of Puerto Rico, all elevation information should be submitted in feet; for Puerto Rico, the elevation information should be submitted in meters.
- Elevation information must specify a vertical datum; if the datum is neither the National Geodetic Vertical Datum of 1929 (NGVD 29) nor the North American Vertical Datum of 1988 (NAVD 88), a conversion to NGVD 29 or NAVD 88 must be provided.
- A United States Geological Survey (USGS) quadrangle map does not provide enough detail to be acceptable as elevation information for MT-1 processing; it may not be accepted in lieu of surveyed and certified elevation information.
- Please note that if a change is made to elevations previously submitted to FEMA, all changes must be accompanied by a clear explanation for the change(s) and must be certified by a licensed professional eligible to collect and certify elevation information within their state.

### **3.3. Compliance Data Requirements**

MT-1 reviews are completed with the understanding that the subject of the determination or comment adheres to the federal minimum requirements listed in Title 44 of the CFR.



One of these requirements is that the low floor of any new construction or substantial improvement to a residential structure shown within the SFHA must have the lowest floor (including basement) elevated to or above the BFE. Non-residential structures being built or substantially improved must have the lowest floor elevated to or above the BFE OR be floodproofed to or above the BFE. For additional information please see 44 CFR 60.3(c)(2) and 60.3(c)(3).

In addition to ensuring that existing projects are compliant with NFIP regulations, a compliance review is also completed for all proposed projects. If the submitted data indicate that the proposed project will not be compliant with the minimum requirements set forth in 44 CFR 60.3, the applicant may be required to revise the project plans prior to FEMA issuing a CLOMA or CLOMR-F comment document.

A LOMR-F, CLOMR-F or LOMR-FW will not be issued if the requester does not provide a fully completed, signed and dated Community Acknowledgement Form. This form is completed by the local community official responsible for floodplain management, usually known as the floodplain administrator. A LOMR-F, CLOMR-F or LOMR-FW cannot be processed in a non-participating community because no one within the community is authorized to sign the Community Acknowledgement Form.

Many states and local communities incorporate higher standards as part of their floodplain management regulations. These standards provide additional protection from local flood hazards or protect from floods greater than the base flood used to map the SFHAs on the effective FIRM. FEMA encourages these higher standards, which provide additional protection for property and lives, so if a property is in or near an SFHA, it is recommended that the property owner consult the local community before considering any new development or a substantial improvement to an existing structure.

To demonstrate compliance with NFIP requirements, the following forms or data may be required before a review can be completed:

- Community Acknowledgement Form (Form 3; MT-1 Application)
  - Completion of a Community Acknowledgement Form by the community official responsible for floodplain management (or designee) is done at the discretion of the local community. An MT-1 applicant should work closely with their local community to determine whether the MT-1 process is appropriate for review of specific projects. An MT-1 request is not a permit and should not be used to attempt to bypass the local permitting process and all other necessary federal, state and local reviews and approvals. For any needed technical assistance, community officials should contact their NFIP State Coordinator and/or the FEMA regional office.
  - Part A must be completed for conditional or as-built requests based on fill; it confirms that the fill placement meets or will meet (for proposed fill) all related development requirements.



- Part B must be completed when the subject encroaches on the regulatory floodway on the effective FIRM; it confirms that no fill has been or will be placed within the regulatory floodway and that all related development requirements have been met.
- A community's comments must not retract or modify the standard wording included on the form.
- For requests involving existing fill, the form must be dated after the date of fill placement.
- When fill has been or will be placed on part of a property shown within the effective regulatory floodway, both sections of the form must be completed.
- **Endangered Species Act (ESA) Compliance Documentation**
  - Applicants must provide documentation which demonstrates that ESA compliance has been achieved prior to the review of any CLOMR-F request. For CLOMA, LOMA, and LOMR-F requests involving floodplain activities that have occurred already, private individuals and local and state jurisdictions must comply with the ESA requirement independently of FEMA's process.
  - Additional information about ESA and meeting the CLOMR-F requirements can be found in the guidance document titled, "Documentation of Endangered Species Act Compliance for Conditional Letters of Map Change," available online at [https://www.fema.gov/sites/default/files/2020-02/ESA\\_Guidance\\_May\\_2016.pdf](https://www.fema.gov/sites/default/files/2020-02/ESA_Guidance_May_2016.pdf).
- **State Approval Letter**
  - Although uncommon, a letter from the state is sometimes required before FEMA will issue an MT-1 determination.
  - When such a letter is needed, the case usually involves a subject within the regulatory floodway on the effective FIRM.

### **3.4. Other Data Requirements**

#### **Application Fee and Payment Information Form**

- Fees are required to process CLOMA, CLOMR-F, and LOMR-F requests.
  - Checks or money orders should be addressed to the National Flood Insurance Program.
  - The current fee schedule for MT-1 requests is available online at [www.fema.gov/flood-map-related-fees](http://www.fema.gov/flood-map-related-fees).



- FEMA will not reimburse an applicant for costs associated with obtaining the data necessary for reviewing a request.
- Fees may not be waived for resubmissions of completed requests unless the new request is received within 90 days of the date of the determination document or comment document, or the new request is for a redetermination or reissuance based on a change to the effective FIRM.
- Fees are reassessed for resubmissions if requested data are not received within 90 days of the date of the request in the original MT-1 case (see FEMA Policy 204-078-1 SID 217 at [https://www.fema.gov/sites/default/files/documents/fema\\_flood-risk-analysis-and-mapping-policy\\_rev11.pdf](https://www.fema.gov/sites/default/files/documents/fema_flood-risk-analysis-and-mapping-policy_rev11.pdf)).
- Fees are reassessed for resubmissions if the subject of the request has changed. This may include, but is not limited to additional fill being placed; metes and bounds changes for a portion of property; changing from property to a portion of property; changing from property to a structure request, etc.

<b>If the subject of the determination is to evaluate:</b>	<b>Fee</b>
Single lot (in its entirety) with multiple structures	Single Lot Fee
Single metes and bounds area with multiple structures on a single lot	Single Lot Fee
Multiple structures on a single lot	Multiple Lot Fee
Multiple metes and bounds areas on a single lot	Multiple Lot Fee
Single metes and bounds area intersecting or encompassing multiple lots (existing or proposed lots)	Multiple Lot Fee

### **Flood Elevation Supporting Data**

- Data may be requested when the subject is in a Zone A SFHA, which does not have established BFEs. An applicant is required to research whether a 1-percent-annual-chance flood elevation is already available for their property by contacting federal, state, or local agencies, and to submit whatever data can be located.
  - If the data does not exist, the applicant may submit a letter to this effect, and the best available data will be used to calculate a 1-percent-annual-chance flood elevation for the subject during the MT-1 review.



- If the subject is larger than 5 acres or includes more than 50 lots, the applicant must provide certified 1-percent-annual-chance flood elevations and supporting back-up data.
- More details on the requirements for Zone A areas can be found in Section 4.6.

#### **Certified Metes and Bounds Description and Map**

- Required when the subject is a portion of a legally defined property; displays and describes the area submitted for review.
- Both the description and the map must be certified by a licensed professional eligible to collect and certify survey information.
- More detail on metes and bounds requests is available in Section 4.8.

#### **Site Survey Showing Property Boundary and Structure Location(s)**

- Required when multiple structures are located on a property.
- Must show the property boundary and the location of each structure on the property.
- Each structure must be labeled with a unique identifier, such as residence, garage, shed, building 1, building 2, etc.
- Must be certified by a licensed professional eligible to collect and certify survey information.

#### **Condominium Building Processing Details**

Condominium buildings have several special MT-1 processing requirements:

- A recorded master condominium deed is required. A recorded deed for an individual condominium unit is not acceptable.
- If a building is deeded as a condominium, a determination/comment will not be processed for individual condominium units, only for the entire building (inclusive of all units). Therefore, a LAG is required for the entire building, not just for an individual unit.

### **3.5. Common Issues with Submitted Data**

The following issues (not an exhaustive list) are some of the more common problems found with the data submitted for MT-1 applications:

- Not all of the necessary forms/documents are submitted.
- Forms are not fully completed or are not signed/dated/certified. For instance, if an item is not completed or at least partially completed, and there is only a phrase like “see attached” in the



field, the form will be returned to be completed appropriately. If necessary, a continuation sheet can be used, but do not leave any question or portion of a form blank or only containing a phrase like "see attached."

- Confusion about definitions used by the NFIP, especially concerning:
  - Lowest Adjacent Grade (LAG).
  - Lowest Lot Elevation (LLE).
  - Lowest Floor Elevation (LFE).
  - Fill.
- Submitted elevations for an as-built request are not based on finished conditions.
- Recordation data on the deed or plat is missing or illegible.
- The plat, tax map or other submitted mapping is insufficient to definitively identify the subject or accurately locate the parcel on the FIRM.
- The effective (current) FIRM panel is not used when locating the property on the FIRM/FIRMette.
- Issues with portion of property requests as described by metes and bounds:
  - Required map and accompanying description not submitted or do not match.
  - Required map and accompanying description not certified.
  - Commencement point is not a legally defined/recorded point.
  - Bearings and distances are not shown on the accompanying map.
  - Metes and bounds area contains portions of existing or proposed buildings and/or existing or proposed drainage.
  - Metes and bounds area is not an enclosed portion of property.
  - Metes and bounds removal will create a disconnect in the SFHA.
  - Metes and bounds is submitted with the intent of removing only the SFHA shown on the FIRM.
  - Metes and bounds is submitted as an exception (an area intended to remain in the SFHA).
  - Metes and bounds area attempts to redefine the SFHA boundary.



- Metes and bounds area is not for a buildable portion of property.
  - A buffer in the vertical elevation between the LLE for the metes and bounds area and the corresponding BFE is recommended to avoid having to revise the metes and bounds portion of property or receiving a non-removal.
  - For a portion of property with a range of BFEs, multiple LLEs may need to be surveyed for comparison to multiple BFEs. This is usually a requirement for large areas or a flooding source with rapidly changing BFEs.
  - Metes and bounds description is not submitted in digital format.
- The request is not within the scope of the MT-1 LOMC process. See Section 2.1

**Table 2: Required Forms and Minimum Data Required by Letter**

<b>Forms<sup>1</sup></b>	<b>CLOMA</b>	<b>CLOMR-F</b>	<b>LOMA</b>	<b>LOMR-F</b>	<b>LOMR-FW<sup>2</sup></b>	<b>LOMR-VZ<sup>3</sup></b>
Property Information Form	Required	Required	Required	Required	Required	Required
Elevation Data <sup>4</sup>	Required <sup>4</sup>	Required <sup>4</sup>	Required <sup>4</sup>	Required <sup>4</sup>	Required <sup>4</sup>	Required <sup>4</sup>
Elevation Form (continuation) <sup>5</sup>	Some requests	Some requests	Some requests	Some requests	Some requests	Some requests
Community Acknowledgement Form Part A – Fill	Not Required	Required	Not Required	Required	Not Required	Not Required
Community Acknowledgement Form Part B - Floodway	Not Required	Not Required	Some requests	Some requests	Required	Not Required
Payment Information Form and Fee <sup>6</sup>	Required <sup>6</sup>	Required <sup>6</sup>	Not Required	Required <sup>6</sup>	Not Required	Not Required
<b>Additional Data</b>	<b>CLOMA</b>	<b>CLOMR-F</b>	<b>LOMA</b>	<b>LOMR-F</b>	<b>LOMR-FW<sup>4</sup></b>	<b>LOMR-VZ<sup>5</sup></b>
Recorded Deed OR Recorded Plat	Not Required	Not Required	Required	Required	Required	Required
Tax Map <sup>7</sup>	Required	Required	Required	Required	Required	Required
Annotated FIRM	Required	Required	Required	Required	Required	Required

1 The forms listed in this table are referenced to the MT-1 application forms package. Online submittals and submittals eligible to use the MT-EZ forms need similar information.

2 The LOMR-FW letter type is not a standard request type, but it has specific data requirements.

3 The LOMR-VZ letter type is not a standard request type, but it has specific data requirements.

4 Either the Elevation Form, MT-EZ Section B, OR the Elevation Certificate is required unless the subject is clearly and entirely outside of the SFHA. Each Elevation Certificate can only be used for one proposed or existing structure.

5 The Elevation Form with continuation pages can be used for multiple properties or multiple structures.

6 For a specific fee amount, see [www.fema.gov/flood-map-related-fees](http://www.fema.gov/flood-map-related-fees).

7 A tax map or other suitable map is needed to accurately show the location of the property.



ESA Compliance	Not Required	Required	Not Required	Not Required	Not Required	Not Required
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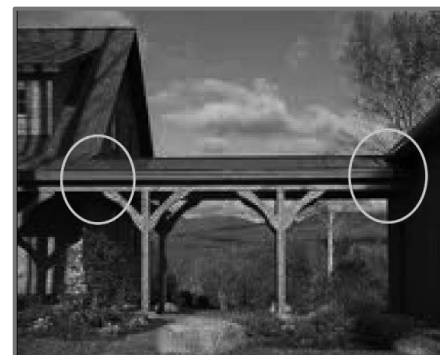
## 4. Basis of MT-1 Determinations and Comments

MT-1 determinations are based on a comparison of the effective flood hazard data to both the horizontal location and vertical elevation of the subject(s). Review procedures vary based on the type of flood hazard that affects the subject. There may also be variations based on specific characteristics of the subject.

When a structure encroaches on the SFHA, the determination or comment is based on a comparison of the effective (regulatory) BFE or 1-percent-annual-chance water-surface elevation to the elevation of the LAG to the structure. When a BFE is available in the FIS report, back-up hydrologic and hydraulic modeling is not researched to attempt to verify the BFE determined from the FIRM or other FIS information. Additionally, new modeling submitted for a flooding source with a BFE available in the effective FIS report will not be reviewed as a part of the MT-1 review process. These requests are more appropriate as an MT-2 CLOMR or LOMR submittal.

The LAG is defined as the elevation of the lowest point of ground touching a structure; it must include:

- Structural supports for a building, such as piers, posts or columns.
- An attached garage.
- Supports for an attached deck.
- The bottom of a loading dock (see Section 4.10).
- Attached stairs including exterior basement stairs (see Section 4.10).
- The bottom of window wells (see Section 4.10).
- Any accessory or additional building attached by a breezeway, pedestrian bridge, covered entryway, etc. In the picture, the LAG should be inclusive of both buildings due to the breezeway attaching both buildings.



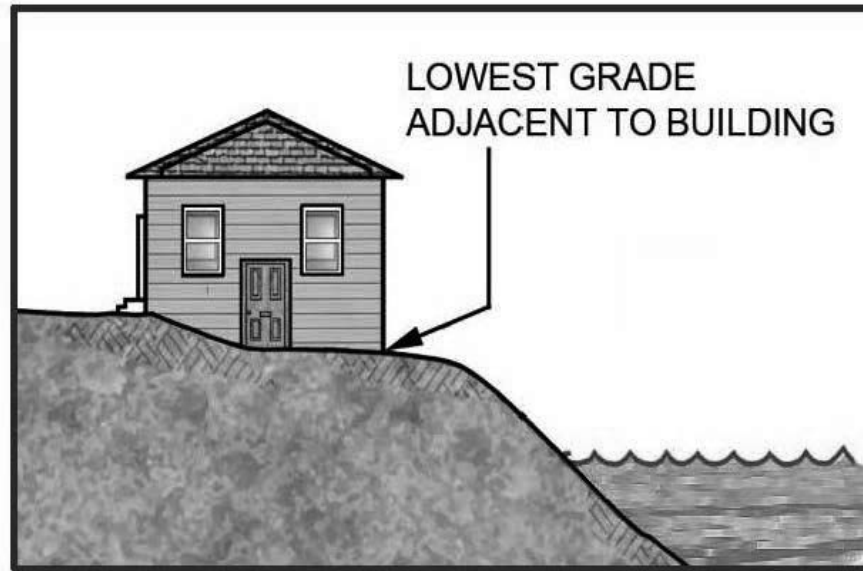
The LAG must be certified by a licensed professional eligible to certify vertical elevation data and must be provided on the appropriate application form. All elevations must have a vertical datum specified and, if applicable, the elevations must have a conversion to either NAVD 88 or NGVD 29. If the LAG for a structure is at or above the corresponding BFE, the structure may be eligible to have the SFHA designation removed.

The Elevation Certificate instructions provide additional information, as well as figures on where the LAG should be taken for various structure types. The Elevation Certificate can be found at



[www.fema.gov/media-library/assets/documents/160?id=1383](http://www.fema.gov/media-library/assets/documents/160?id=1383). Additional information on the appropriate location to take a LAG is also available in Section 4.10, Intervening High Ground Considerations.

Figure 1 and Figure 2 show examples of an appropriate LAG for a structure.



**Figure 1: LAG - Lowest Ground Touching a Structure**

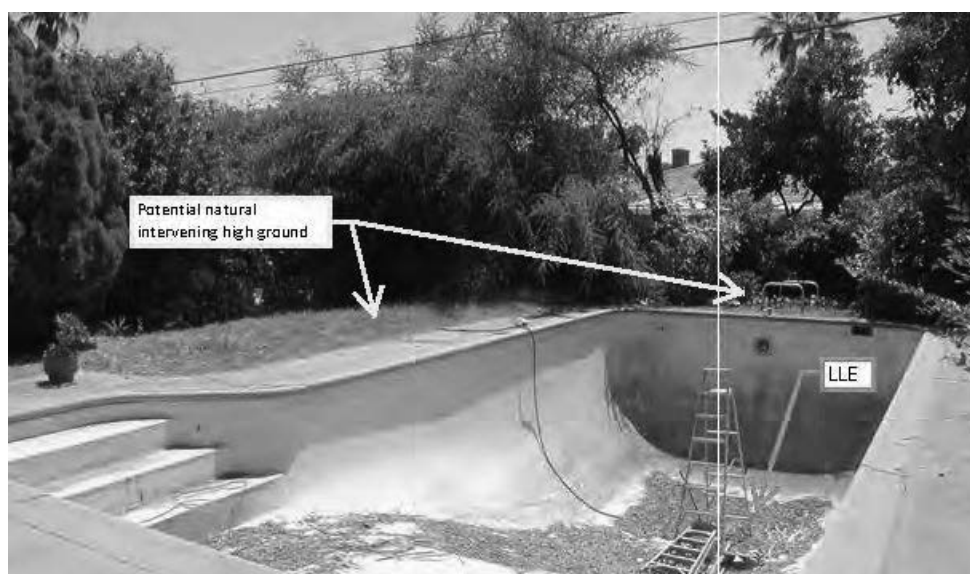




**Figure 2: LAG - Structure with Attached Deck**

When a **lot (property)** encroaches on the SFHA, the determination or comment is based on a comparison of the effective BFE or 1-percent-annual-chance water-surface elevation to the **lowest lot elevation (LLE)**.

For an entire property, the LLE is defined as the lowest ground elevation on the legally recorded property (recorded deed or plat). To remove an entire property from the SFHA, the LLE must be at or above the corresponding BFE, and the property to be removed shall not include any watercourse or drainage, including either permanent or intermittent water. If a property includes a watercourse, it may be possible to remove a portion of the property by defining the area of the property that is at or above the BFE and that excludes the area(s) of water (see Figure 4 and Figure 5).

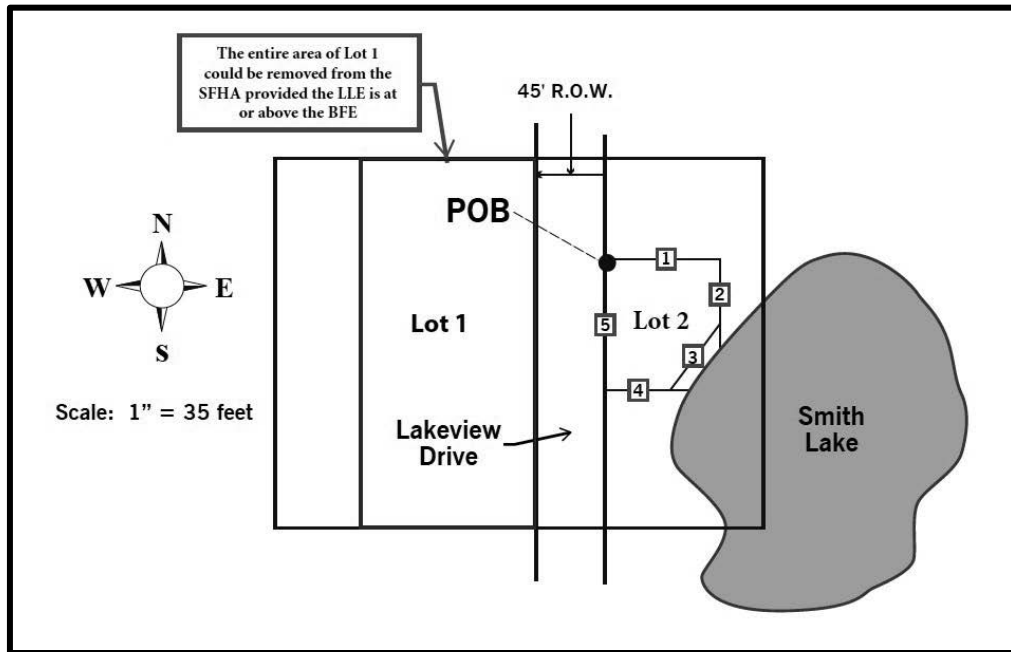


**Figure 3: LLE - Property with In-Ground Swimming Pool**

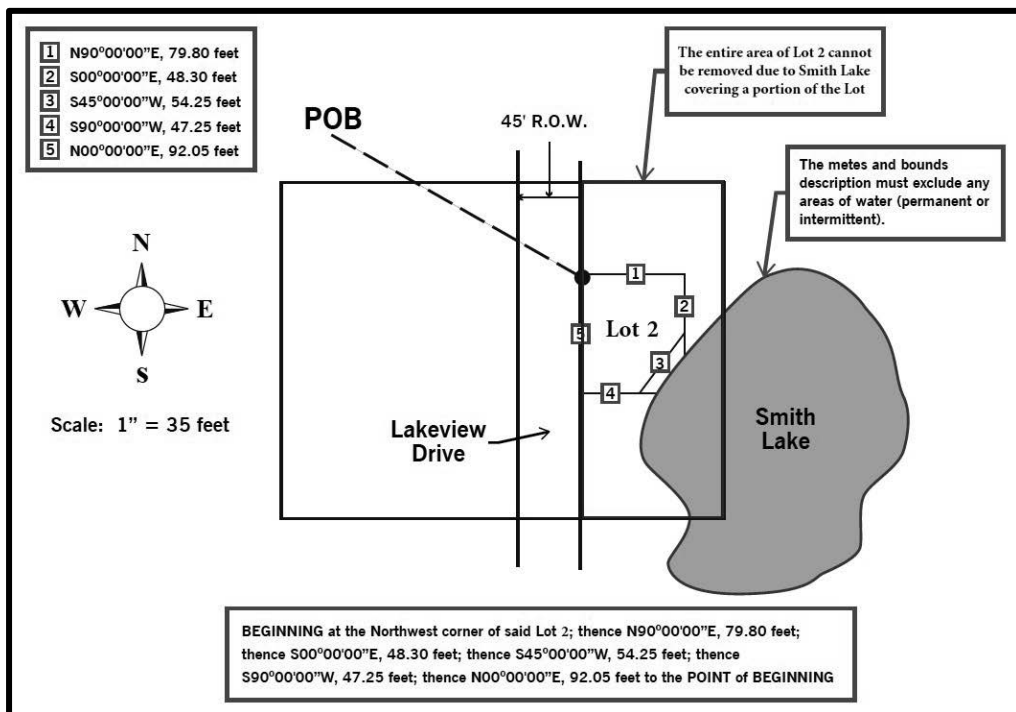
The LLE may need to include the bottom of an in-ground swimming pool. In some situations, natural intervening high ground may protect this LLE (bottom of the pool) by providing protection from the adjacent BFE. See Section 4.10 for more information on the use of natural intervening high ground believed to provide protection of a LAG or LLE that is below the adjacent BFE.



The LLE must be provided on the Elevation Form and certified by a licensed professional eligible to certify vertical elevation data. If the LLE is at or above the corresponding BFE, the property may be eligible to have the SFHA designation removed.



**Figure 4: Entire Property - Lot 1 - No Watercourse**



**Figure 5: Portion of Property - Lot 2 - With Watercourse**



When a **portion of property** encroaches on the SFHA, the determination or comment is based on a comparison of the effective BFE or 1-percent-annual-chance water-surface elevation to the **LLE within the described portion of property**.

To have a portion of a property reviewed for removal from the SFHA, the application data must include both a written description and a map, certified by a licensed professional, defining the portion of property to be considered for removal from the SFHA. The description defining the portion of property is known as a metes and bounds description. It must describe a closed area and be referenced to a legally defined point.

The LLE for the metes and bounds area (portion of property) must be provided on the Elevation Form and certified by a licensed professional eligible to certify vertical elevation data. If the LLE is at or above the corresponding BFE, the portion of property may be eligible for removal from the SFHA.

Some requests may require the submittal of multiple LLEs for a metes and bounds area. This usually applies to a metes and bounds area that is large enough for the BFE to change across the property, or to an area where the BFE of the flooding source changes rapidly due to the steep gradient of the stream profile. For most MT-1 requests, the BFE is calculated to the tenth of a foot (100.0 feet, 100.1 feet, etc.), so the BFE may not need to change very much for the submitted LLE to be below the upstream BFE. By submitting multiple LLEs throughout the metes and bounds area and along the flooding source, the corresponding BFE at that location can be used for comparison to determine if the portion of property is eligible for removal from the SFHA using a range of BFEs.

More information on the data needed for review of a portion of property (metes and bounds request) is in Section 4.8.

### **MT-1 Determinations and Comments vs. Community Compliance Reviews**

The structure elevations used to complete an MT-1 review are not the same structure elevations that are used to determine whether a building is compliant with minimum NFIP regulations.

Compliance reviews may compare the elevation of the top of a structure's bottom floor to the BFE or 1-percent-annual-chance flood elevation; MT-1 reviews compare the lowest adjacent grade elevation to the BFE or 1-percent-annual-chance flood elevation. The SFHA designation cannot be removed from a compliant structure built within the SFHA if the LAG to the structure is lower than the BFE (1-percent-annual-chance flood elevation). In comparing the LAG of a structure to the adjacent BFE, the MT-1 review simply determines whether a structure is located appropriately within the SFHA and whether flood insurance is required for a structure with a federally insured mortgage.

### **MT-1 Determinations and Comments vs. Actuarial Flood Insurance Rating**

MT-1 reviews compare the LAG elevation to the BFE (1-percent-annual-chance flood elevation). Actuarial flood insurance rates are based on multiple rating variables. In comparing the LAG of a structure to the adjacent BFE, the MT-1 review simply determines whether a



structure is located appropriately within the SFHA and whether flood insurance is required for a structure with a federally insured mortgage.

#### 4.1. Locating the Subject on the Effective FIRM

During an MT-1 review, the subject must be accurately located on the effective FIRM in order to answer the following questions:

- Is the subject within the SFHA, or is there a clear separation between the subject and the SFHA boundaries, demonstrating the subject is outside of the mapped SFHA?
- If the subject is within the SFHA, what is the flooding source and type of flood hazard affecting the property?

After determining the flooding source and type of flood hazard for subject(s) within SFHAs that have BFEs developed, a subject-specific BFE must be calculated using the FIRM and FIS report. For Zone A areas that do not have established BFEs, the best available data will be used to calculate a 1-percent-annual-chance water-surface elevation for the subject(s).

If a subject is in more than one flood zone, as mapped on the effective FIRM, the more hazardous zone is used in making a determination. For example, if the subject is in both Zone AE and Zone VE, Zone VE will be used in the determination because it represents the higher hazard. Similarly, if the subject is affected by both a Zone AE (EL 10 Feet) and a Zone AH (EL 9 Feet), Zone AE (EL 10 Feet) will be used in the determination because the higher BFE makes this the higher hazard. Additionally, if a Zone AO and Zone AE affect a subject, the zone with the higher BFE will be used as this normally represents the higher hazard. An exception would be a Zone AO defining an alluvial fan flood hazard area because the MT-1 process cannot be used to issue a determination or comment for a subject in an alluvial fan flood hazard area. A subject in both Zone D and a mapped SFHA will normally use the BFE from the mapped SFHA. Similarly, a subject in both Zone A (approximate) and in an SFHA with BFEs established will use the SFHA with a BFE established.

This procedure for subjects in more than one flood zone is consistent with the NFIP procedures for flood insurance rating.

#### 4.2. Riverine SFHA Methodology

This section covers the specific methodology used to review properties affected by riverine flood hazards. Within a riverine SFHA, the 1-percent-annual-chance flood elevation will be calculated at the **most upstream point** where the subject of the determination intersects the SFHA on the effective FIRM.

##### Using the FIS Report to Determine a BFE

To make a definitive determination for a subject, an accurate BFE must be determined using the FIRM along with additional resources within the FIS report. The appropriate resources to use will



depend on the hydraulic model type (1-D or 2-D) used to generate the mapping output. These resources may include a Floodway Data Table, a Stream Profile, a Summary of Stillwater Elevations Table, and where a 2-D model was used, an FIS grid insert. The level of detail used to map the SFHA will determine whether any of these products exist, and a quick review of the FIS report table of contents will confirm whether any of them are available. Table 3 shows the most common data in the FIS report that may be available for use in determining a specific BFE for the subject.

**Table 3: Data Used to Determine a Riverine BFE**

Type of Hazard	Zone	Data Element	Location - Description
Riverine	AE or A1-A30	Floodway Data Table (FWDT)	FIS report - The FWDT is produced for riverine flooding sources with a regulatory floodway. At each mapped cross section, the BFE is listed to the tenth of a foot (Figure 6).
Riverine	AE or A1-A30	Stream Profile	FIS report - Stream Profiles produced for detailed study streams can be used to obtain a BFE for any point along the stream and are more accurate than the whole-foot BFEs shown on the FIRM. BFEs along the stream profile may only be applicable on or in the immediate vicinity of the profile baseline used to generate the stream profile. Where a 2-D model was used, and evaluation lines are shown on the FIRM, the user should reference the mapped evaluation lines and BFE lines to determine the applicable BFE. BFEs generated based on a 2-D model are contoured from the water-surface elevation grid output from the model, and therefore, they are the best representation of the water surface across the floodplain width.

### Floodway Data Table

The FWDT lists specific information for each mapped cross section or evaluation line shown on the FIRM (BC, BD, and BE are cross sections shown in Figure 8). The elevations listed at each cross section are accurate to the tenth of a foot and represent some of the best riverine elevation data within the FIS report. However, the following limitations relate to obtaining and using FWDT elevation information:

- An FWDT is usually only available for streams with a regulatory floodway, meaning that FWDTs are not available for all riverine flooding sources studied by detailed methodology (with BFEs).
- The elevations listed at each cross section or evaluation line are normally applicable only if a subject of determination is located directly on a mapped cross section or evaluation line. If a subject is upstream or downstream of a cross section or evaluation line, additional information should be used to obtain the specific BFE applicable to the subject. In areas where a 1-D



hydraulic analysis was used to generate results (and cross sections are displayed on the FIRM) the stream profile should be used to determine the applicable BFE. Where a 2-D hydraulic analysis was used to generate results (and evaluation lines are displayed on the FIRM), the mapped evaluation lines and BFE lines should be used to determine the applicable BFE.

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	920	34	219	4.4	22.0	14.2 <sup>2</sup>	15.2	1.0
B	2,560	38	188	4.6	22.0	18.0 <sup>2</sup>	18.1	0.1
C	3,560	34	187	4.7	22.0	20.0 <sup>2</sup>	20.1	0.1
D	4,280	38	169	2.5	22.0	20.1 <sup>2</sup>	20.2	0.1
E	4,390	38	169	2.5	22.1	20.1 <sup>2</sup>	20.2	0.1
F	4,830	26	102	4.2	22.3	20.6 <sup>2</sup>	20.7	0.1
G	5,270	26	109	3.9	22.6	21.5 <sup>2</sup>	21.7	0.2
H	5,360	26	109	3.9	22.7	21.5 <sup>2</sup>	21.7	0.2
I	5,530	36	167	2.6	22.8	22.0 <sup>2</sup>	23.0	1.0

<sup>1</sup>Feet above mouth  
<sup>2</sup>Computed without consideration of backwater effects

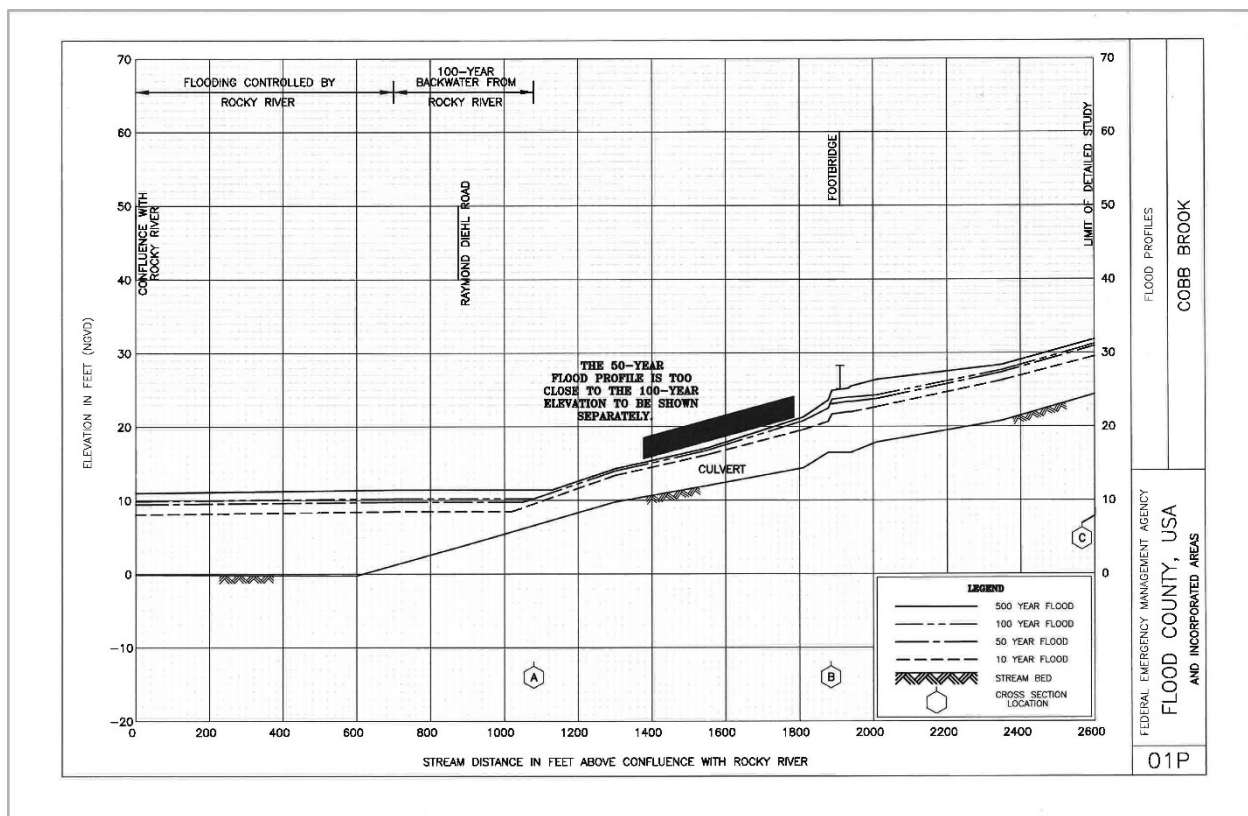
TABLE 6	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	FLOOD COUNTY, STATE AND INCORPORATED AREAS	FLOODING SOURCE: ROARING RIVER

**Figure 6: Example of Floodway Data Table from FIS Report**

### Flood Profile

As the name indicates, a Stream Profile (Figure 7) provides a graph showing the flood elevations in profile view along a riverine flooding source. The FIS report profiles contain information for at least the base (1-percent-annual-chance or 100-year) flood. Many, but not all profiles, also contain a stream profile for the 10-percent (10-year), 2-percent (50-year), and 0.2-percent (500-year) flood elevations.





**Figure 7: Example of Stream Profile from FIS Report**

The stream profile is the product used to determine an accurate BFE at any point along a riverine flooding source when a 1-D hydraulic analysis was used to produce the regulatory stream profile. Where a 2-D hydraulic analysis was used, the stream profile should only be used when the subject location falls in the immediate vicinity of the profile baseline. In all other cases, either evaluation lines and BFE lines on the FIRM should be used, or an FIS Grid Insert (where available). Procedures for determining BFEs from these sources are described in subsections below. Several steps are followed to obtain a BFE using the stream profile:

**Step 1** - The location of the subject on the FIRM is used to measure from the upstream edge of the subject to a feature shown on both the FIRM and the profile. The measurement is usually taken along the centerline of the flooding source. The known point can be a cross section, road crossing, dam, etc. In Figure 8, the measurement is taken from Cross Section BD to the subject.

**Step 2** - Using the measured distance, the same horizontal distance is located downstream of Cross Section BD on the stream profile. Each profile has a horizontal scale shown at the bottom of the profile. It is critical to use the correct scale when making this measurement on the profile.

**Step 3** - Once the subject is accurately located on the stream profile, the BFE can be determined using the profile line for the 1-percent-annual-chance flood elevation. Using the vertical scale shown on the profile (normally 5, 10, or 20 feet per inch), read the BFE for the property from the



profile. Again, use of the correct vertical scale is critical in obtaining an accurate BFE at the subject. Also, it is important to make note of the correct vertical datum from the FIRM and profile for comparison of the BFE to elevations for the subject (LAG, LLE, etc.). In this example, the vertical datum is NAVD 88.



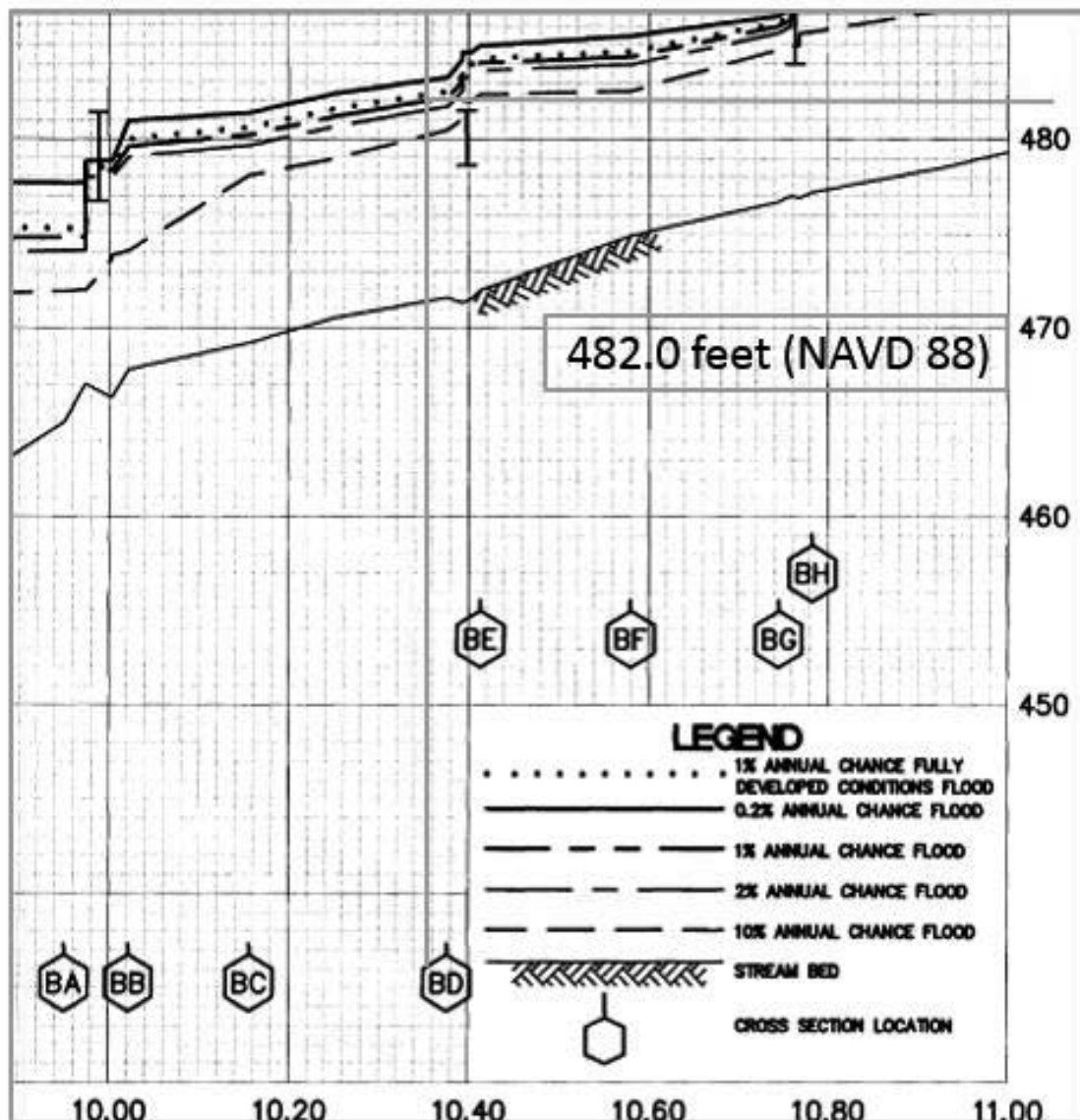
**Figure 8: Measuring to Subject from a Cross Section (Not to Scale)**

Example of Using a Stream Profile to Obtain a BFE (Figures 8 and 9):

1. The FIRM scale for this example is 1" = 500 feet (not to scale in Figure 8), and the measurement shown in Figure 7 is 106 feet from Cross Section BD to the subject.
2. The horizontal scale of the profile (Figure 9) is 1" = 0.2 miles or 1,056 feet per inch.  $106' / 1,056' = 0.10" = 1$  horizontal block, which each represent one tenth of an inch.

At the subject location, 106 feet downstream of Cross Section BD, the BFE read from the profile at the 1-percent profile line is 482.0 feet (NAVD 88).





**Figure 9: Portion of Stream Profile Used to Obtain BFE**

### BFE Lines and Evaluation Lines

If a subject location is within an SFHA with BFEs shown on the FIRM, but there is no stream profile for the flooding source in the FIS report, the FIRM may need to be used to interpolate between two BFEs. For mapped products based on a 1-D hydraulic analyses, interpolating between BFEs will generate a less detailed BFE for the subject. If necessary, the following steps are followed when calculating a BFE using only the FIRM:

- Select the closest upstream and downstream BFEs to the subject from the FIRM.
- Select the upstream point of the flooding affecting the subject along the flooding source.



- Assuming a constant slope in the flow between the two BFEs, make a mathematical calculation for the BFE at the subject using the following formula:

$$X = E_1 + ((E_2 - E_1) * (D_2 / D_1))$$

Where:

X = the BFE at the upstream edge of the subject.

E1 = the whole-foot BFE downstream of the subject.

E2 = the whole-foot BFE upstream of the subject.

D1 = Distance between E1 and E2, measured along the flooding source.

D2 = Distance from subject to E1 (downstream BFE), measured along the flooding source.

Using numbers where  $E_1=100.0'$ ;  $E_2=105.0'$ ;  $D_1=500.0'$ ; and  $D_2=100.0'$  the calculated BFE is:

$$X = 100.0 + ((105.0 - 100.0) * (100.0 / 500.0)) = 100.0 + (5.0 * 0.2) = 100.0 + 1.0 = \mathbf{101.0 \text{ feet.}}$$

For 2D models, the profile baseline should not be used as the distances D1 and D2. Instead, the distances should be measured along the shortest straight line between the nearest BFEs, as show in the figure below. Point A is 62 feet upstream of BFE 2,278 and 110 feet downstream of BFE 2,282. The elevation of Point A is determined by:

$$\text{BFE} = E_1 + (E_2 - E_1) * (\text{DS Distance}) / (\text{Total Distance}) \text{ Or}$$

$$\text{BFE} = 2,278 + (2,282 - 2,278) * 62 / (62 + 110) = 2,279.4 \text{ feet}$$





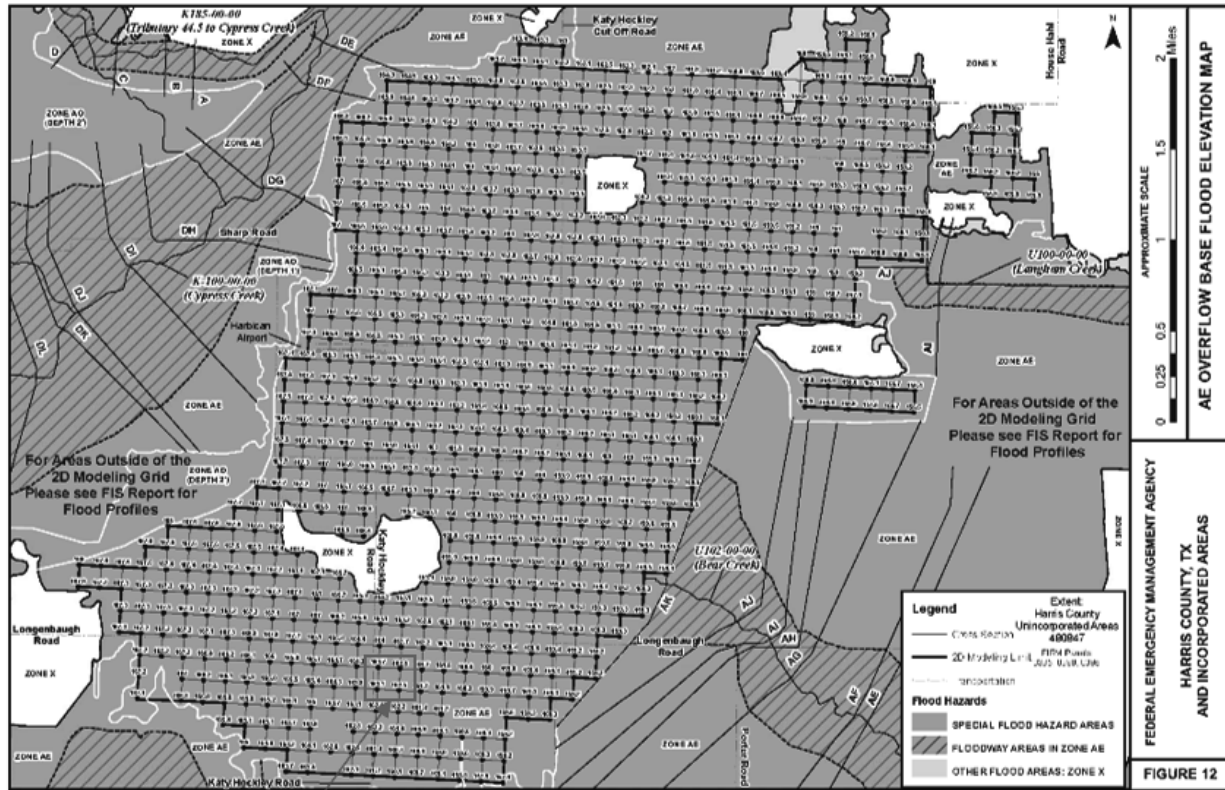
**Figure 10: Measuring a Subject between BFEs in overbank areas when the floodplain is derived from 2-D models.**

### FIS Grid Inserts

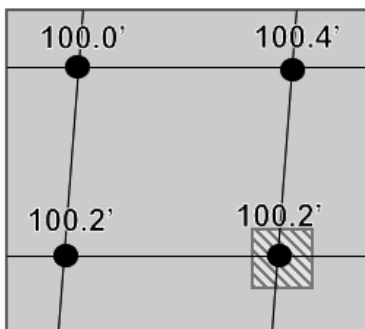
If a subject location is within an SFHA with BFEs shown on the FIRM, but there is not sufficient detail available on the FIRM panel to interpolate an elevation from the mapped BFEs, an FIS Grid Insert should be available in the FIS report. Figure 11 below shows an example of an FIS Grid Insert. The display will show a modeled BFE at all nodes or cells within an area mapped using a 2-D hydraulic analysis. Depending on the hydraulic model used, the grid display may be rectangular (as in the example in Figure 11 or irregular).

To determine the appropriate BFE from an FIS Grid Insert, the user should first determine where the subject falls relative to the BFEs at each node or cell. If a subject location falls directly on a node or cell, that BFE should be used. If a subject falls on a direct line between two reported nodes or cells, those two values should be used to determine an average BFE. Finally, if a subject location falls between several nodes, a composite average should be determined. Examples of these three situations are illustrated on Figure 11.



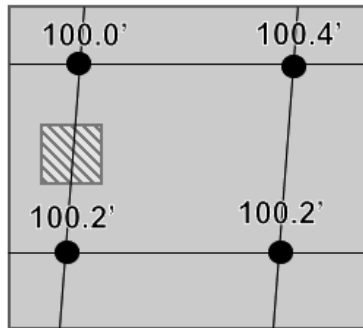


**Ex. 1: Subject on a reported BFE**



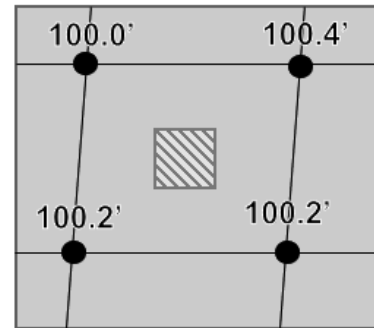
$$\text{BFE} = 100.2'$$

**Ex. 2: Subject on line between reported BFEs**



$$\begin{aligned}\text{BFE} &= (100.0 + 100.2')/2 \\ \text{BFE} &= 100.1'\end{aligned}$$

**Ex. 3: Subject between multiple reported BFEs**



$$\begin{aligned}\text{BFE} &= (100.0 + 100.2' + 100.2' + 100.4')/4 \\ \text{BFE} &= 100.2'\end{aligned}$$

**Figure 11: Example of FIS Grid Insert and Calculations to Determine a BFE**

For some requests, a BFE is determined at multiple locations along the flooding source to ensure a correct determination. If the review determines that multiple BFE locations are required, additional elevation information for the subject may be needed to compare to the location of each BFE. The most common reason for obtaining multiple BFE calculations is that the subject results in a non-removal when the highest BFE affecting the subject is compared to the lowest elevation of the



subject. By using multiple points for comparison to the BFE, the outcome of the determination may change. This situation most frequently occurs for the following situations:

- A rapidly changing BFE (steep profile).
- A large property parallel to the flow of the flooding source.
- A large portion of property parallel to the flow of the flooding source.
- A large building parallel to the flow of the flooding source.

### 4.3. Lacustrine and Ponding Area SFHA Methodology

This section covers the methodology used to review properties affected by flooding effects from lakes (lacustrine) and Zone AH SFHAs.

Lacustrine and ponding area SFHAs are normally labeled on the FIRM as Zone AH (EL XX Feet) or Zone AE (EL XX Feet), where XX represents the static BFE for that SFHA. When the whole-foot number from the FIRM does not provide a definitive determination, the FIS report is researched to determine if a Summary of Stillwater Elevations table contains a more detailed BFE. The name of the flooding source shown on the FIRM is used to locate the correct elevation in the table. If a Summary of Stillwater Elevations table does not exist, or if the flooding source is not listed in the table, then the whole-foot BFE from the FIRM is used. Figure 12 shows an example of a Summary of Stillwater Elevations table.

**Table 4: Data Used to Determine a Lacustrine or Ponding Area BFE**

Type of Hazard	Zone	Data Element	Location - Description
Lacustrine	AE or A1-A30	Summary of Stillwater Elevations Table	FIS report - A Summary of Stillwater Elevations table contains elevations at different flood frequencies for an SFHA with a static elevation. While the FIRM normally shows a whole-foot elevation, such as Zone AE (EL 10 Feet), the table normally has elevations to a tenth of a foot (Figure 12).
Lacustrine	AE or A1-A30	FIRM	FIRM - Use the elevation from the FIRM only when no FWDT, Profile, or Summary of Stillwater Elevations table is available.
Ponding Area	Zone AH	Summary of Stillwater Elevations Table	FIS report - A Summary of Stillwater Elevations table contains elevations at different flood frequencies for an SFHA with a static elevation. While the FIRM normally shows a whole-foot elevation, such as Zone AH (EL 10 Feet), the table normally has elevations to a tenth of a foot (Figure 12).
Ponding Area	Zone AH	FIRM	FIRM - Use the elevation from the FIRM only when no Summary of Stillwater Elevations table is available.



Wave set-up was determined to significantly contribute to the total stillwater flood levels along the Atlantic Ocean coastline. The amount of wave setup was calculated using the methodology outlined in the USACE publication Coastal Engineering Research Center, Shore Protection Manual (Reference 5). The 100-year stillwater elevations for Transects 1 to 3 along the Atlantic Ocean presented in Table 2, "Summary of Stillwater Elevations," include wave setup.

The storm-surge elevations for the 10-, 50-, 100-, and 500-year floods have been determined for the Atlantic Ocean, Jesco Lake, Silver Lakes, South Lake, and Stone Lake and are shown in Table 2, "Summary of Stillwater Elevations." The analyses reported herein reflect the stillwater elevations due to tidal and wind setup effects and include the contributions from wave action effects.

**TABLE 2 - SUMMARY OF STILLWATER ELEVATIONS**

FLOODING SOURCE AND LOCATION	ELEVATION (feet NGVD)			
	10-YEAR	50-YEAR	100-YEAR	500-YEAR
ATLANTIC OCEAN Entire open coast shoreline within Flood County	6.7	8.7	10.0 <sup>1</sup>	12.6
JESCO LAKE Entire shoreline within Flood County	6.9	8.9	10.3	12.8
SILVER LAKES Entire shoreline within Flood County	8.6	9.6	10.4	13.5
SOUTH LAKE Entire shoreline within Flood County	6.9	8.9	10.3	12.8
STONE LAKE Entire shoreline within Flood County	7.0	9.0	10.2	12.8
RETENTION POND NO. 1 Entire shoreline within Flood County	N/A	N/A	10.0	N/A

<sup>1</sup> Includes wave set-up of 0.5 foot

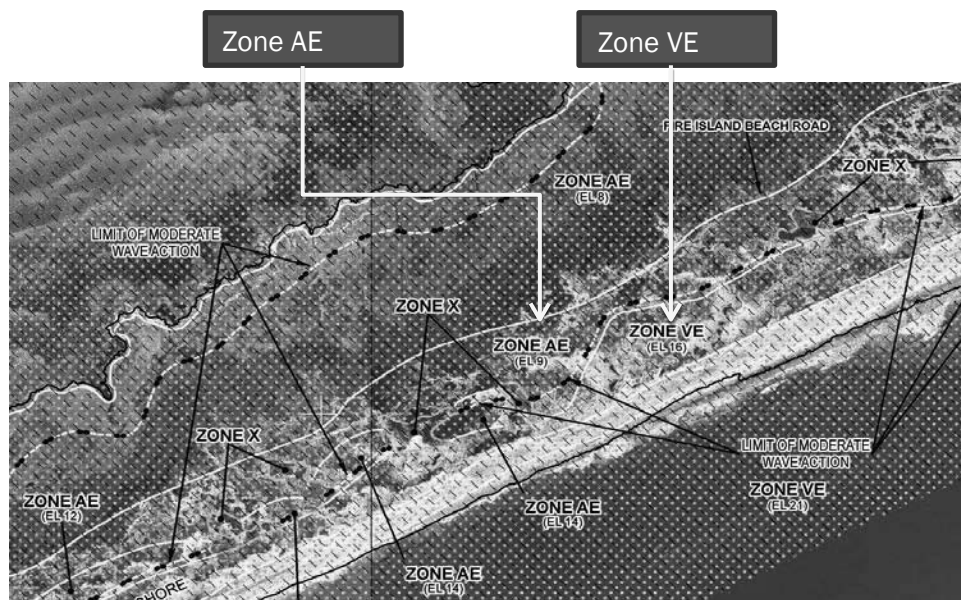
**Figure 12: Example of Summary of Stillwater Elevations Table from FIS Report**

#### 4.4. Coastal Flood Hazard Area Methodology

This section covers the basic methodology used to review properties in an SFHA affected by coastal flood hazards: both coastal high hazard areas (V zones) and coastal AE zones.

MT-1 reviews for subjects in coastal flood hazard areas consider the BFE from the FIRM when making a determination. Please see FEMA Policy 204-078-1 SID 614 at [https://www.fema.gov/sites/default/files/documents/fema\\_flood-risk-analysis-and-mapping-policy\\_rev11.pdf](https://www.fema.gov/sites/default/files/documents/fema_flood-risk-analysis-and-mapping-policy_rev11.pdf).





**Figure 13: Snapshot of FIRM with Coastal Zones Identified**

According to 44 CFR 60.3(e)(6), the placement of structural fill in a CHHA is prohibited. An MT-1 application cannot be processed for a request based on fill if the subject is in a CHHA. Also, any new construction or substantial improvement in a CHHA must be elevated on *pilings or columns*, as defined in 44 CFR 60.3(e)(4).

The flood zone determination for a building elevated on posts, piers or pilings will be made by comparing the LAG to the BFE. The LAG must consider the elevation at which the piling, column or any supporting member of the building enters the ground. If any portion of the structure, including pilings, columns, posts or piers is below the BFE, the SFHA designation may not be removed from the building.

#### **4.4.1. PRIMARY FRONTAL DUNE CONSIDERATIONS**

A Primary Frontal Dune (PFD) is defined as a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach. PFDs are subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the PFD occurs at a point where there is a distinct change from a relatively steep slope to a relatively mild slope.

No MT-1 applications for a subject of determination located seaward of the inland limit of a PFD will be processed. Determinations cannot be provided when the subject is a lot or structure either partially or entirely on a PFD. Please see FEMA Policy 204-078-1 SID 613 at [https://www.fema.gov/sites/default/files/documents/fema\\_flood-risk-analysis-and-mapping-policy\\_rev11.pdf](https://www.fema.gov/sites/default/files/documents/fema_flood-risk-analysis-and-mapping-policy_rev11.pdf).

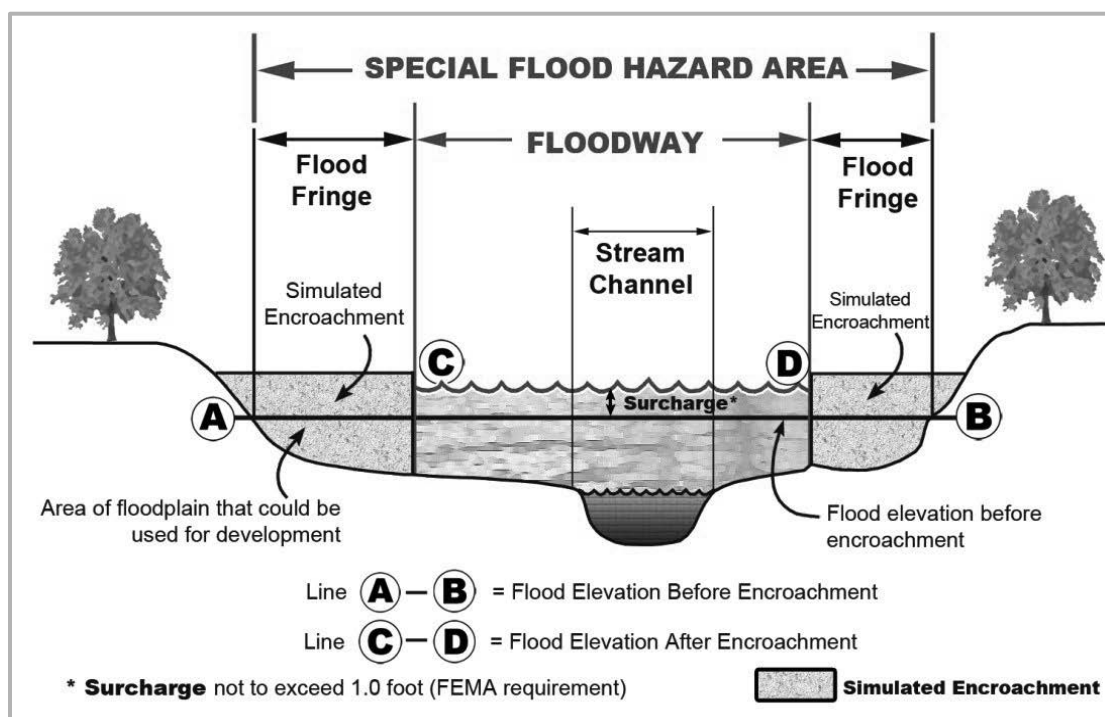


#### 4.4.2. UNNUMBERED ZONE CONSIDERATIONS

If a property is in a Zone V SFHA with no established BFEs, a determination cannot normally be issued under the MT-1 application process. The exceptions to this rule are areas that have a preliminary study with a BFE, draft data approved by FEMA with a BFE, or submitted data with a BFE from other federal agencies, such as the U.S. Army Corps of Engineers. The existing or submitted data are reviewed to determine if an appropriate BFE exists that can be compared to the submitted elevation data for the subject of determination. If an appropriate BFE is available, an MT-1 application may be processed and will be reviewed by a coastal processing Subject Matter Expert.

#### 4.5. Regulatory Floodway Considerations

The regulatory floodway is defined as the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water-surface elevation more than a designated height.



**Figure 14: Regulatory Floodway Schematic**

In practical terms, this means that any proposed development within the regulatory floodway, including fill, new construction and substantial improvements, is not allowed unless it is demonstrated through hydrologic and hydraulic analysis that the proposed development would not result in an increase in flood levels (44 CFR 60.3(d)(3)). A review of this type of analysis (No-Rise/No-Impact data) is outside of the scope of the MT-1 process and must be submitted as a conditional MT-2 request. Per 44 CFR 60.3(d)(4), if an encroachment is proposed within the area of the regulatory floodway, the community must first request a conditional revision to the FIRM and floodway. This type of request is reviewed through the MT-2 process and is known as a CLOMR.



Proposed encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway may not result in any increase in flood levels within the community during the base flood discharge. This must be demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice. However, a formal review of No Rise/No Impact Certification for proposed or existing developments within regulatory floodways is not available through the MT-1 process. No Rise/No Impact analyses must be submitted to the FEMA regional office for review.

The MT-1 process can be used to review a property or structure that is inadvertently included within the regulatory floodway. There are some limitations, but the following situations qualify for review if the community is in agreement and signs Part B of the Community Acknowledgement Form:

- A lot or portion of lot on natural ground (no fill) with the lowest property elevation at or above the BFE.
- A structure on natural ground (no fill) with the LAG at or above the BFE.
- A structure built prior to the initial identification of the regulatory floodway, with the LAG at or above the BFE.
- A small portion of the regulatory floodway, when the review determines there is no need for a more comprehensive floodway revision (MT-2 CLOMR or LOMR request).

If a subject qualifies as an inadvertent inclusion in the floodway, Part B of the Community Acknowledgement Form is required. This form must be completed, signed and dated by the community official responsible for floodplain management.

## **4.6. Zone A (Basic Engineering) Considerations**

An SFHA is the area subject to inundation by the base flood. Zone A SFHAs are usually determined using basic engineering methodologies. Because no detailed hydraulic analyses have been performed, no BFEs or flood depths are shown on the FIRM in Zone A.

MT-1 requests regarding subjects in Zone A can be reviewed, but since no BFEs are shown on the FIRM, a 1-percent-annual-chance flood elevation must be obtained by using the best available data for the area. The best available data is usually one of the following:

- A submitted hydrologic and hydraulic analysis completed for the area by a licensed professional eligible to calculate and certify hydraulic calculations.
- A calculation of the 1-percent-annual-chance flood elevation completed by another federal agency, or from an acceptable state or local agency.
- An in-house calculation of the 1-percent-annual-chance flood elevation by FEMA.



- Limited detail analysis, available with many new FEMA flood studies, that contains cross sections along the flooding source with 1-percent-annual-chance flood elevations.
- Preliminary or draft data with BFE calculations for the area. The use of draft data is acceptable, because no BFE has been established for the Zone A SFHA.

When the request meets specific criteria, FEMA will develop a 1-percent-annual-chance flood elevation for the subject of determination. There are two criteria:

- The property must not be larger than 5 acres OR include more than 50 lots. For a property of that size, calculating the 1-percent-annual-chance flood elevation should be part of the development process.
- MT-1 applicants must research the possibility that federal, state, and local agencies have already calculated a 1-percent-annual-chance flood elevation for the area.

FEMA may require local survey data such as the following to complete the calculation of the 1-percent-annual-chance flood elevation:

- A surveyed cross section or cross sections at the property.
- Culvert or bridge data for a culvert/bridge in the vicinity of the property. These data could include invert elevations, top-of-road elevations, length of the culvert or bridge opening, type and size of culvert or bridge opening, etc.
- Details for a dam in the vicinity of the property.

For more information on methods for determining a BFE within a Zone A SFHA, please review the document titled “Zone A Manual: Managing Floodplain Development in Zone A Areas,” which is available on the FEMA website at [www.fema.gov/media-library/assets/documents/7273](http://www.fema.gov/media-library/assets/documents/7273).

## **4.7. Zone AO Considerations**

A Zone AO SFHA is defined as an area subject to inundation by the base flood due to shallow flooding (usually sheet flow on sloping terrain), where average depths are between 1 and 3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.

When a property is within Zone AO, there is no single approach used to determine whether the SFHA designation can be removed. The review of requests for properties in Zone AO is case specific and must consider several characteristics of the Zone AO flooding:

- The extent of the Zone AO flooding that would inundate the property.
- The direction of the sheet flow in relation to the subject of determination.



- The nature of the Zone AO area, including whether supporting data suggests that the Zone AO flooding will be conveyed by the surrounding streets.
- The projected depth of flooding in the Zone AO area, which is normally 1, 2 or 3 feet.
- Whether the flood water in this zone has a defined velocity (MT-2).

Sufficient topographic information is required to support the removal of a subject from Zone AO. Information must include relevant flow paths and demonstrate that the subject is on high ground relative to the depth of the Zone AO flooding. For many requests, the topographic survey will need to extend beyond the property's boundary to definitively show that the subject will not be inundated by the depth of the base flood. As with all other elevation data, the topographic information must be certified by a licensed professional eligible to certify elevation information in the state.

The following three basic scenarios are considered when determining the appropriate flood elevation to compare to the LLE or LAG:

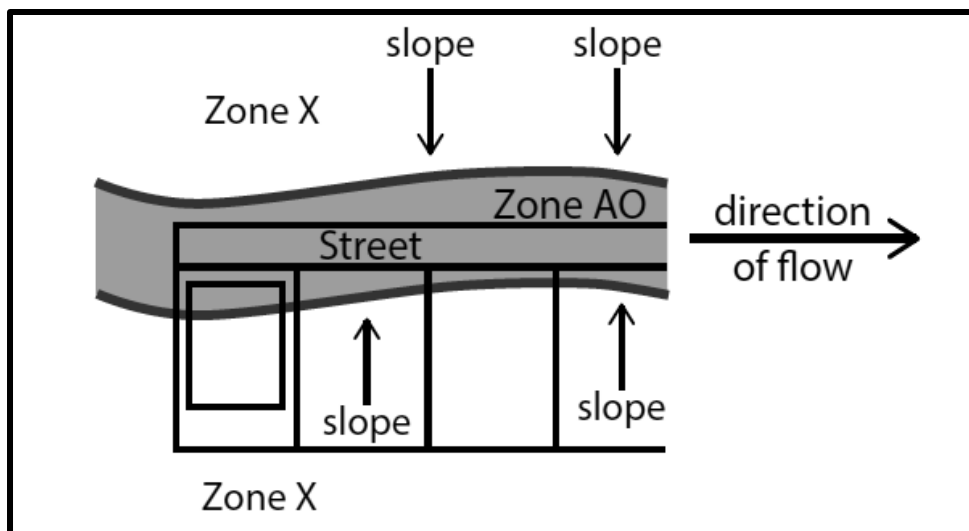
- Base flood is conveyed by the street(s).
- Base flood partially inundates the property.
- Base flood entirely inundates the property.

#### **Base Flood Conveyed by the Street(s)**

If the surrounding slopes keep the flooding conveyed primarily by the street(s), then top-of-curb or crown-of-street elevations (whichever are higher) may be used for comparison to the LLE (property) or LAG elevation (structure). Top-of-curb/crown-of-street elevations, which must be submitted for review, should include multiple locations along the street(s) conveying the Zone AO flooding. The depth of the Zone AO flooding (usually 1.0, 2.0 or 3.0 feet) is added to the highest top-of-curb/crown-of-street elevation to obtain a BFE for comparison to the LLE/LAG. If the LLE or the LAG elevation is at or above the calculated BFE, the subject may be removed from the SFHA.

Example (Figure 15): The applicable top-of-curb elevation for this scenario is 100.0 feet. The depth of flooding is 2 feet (Zone AO (2 feet)). The BFE used for the MT-1 determination is  $100.0 + 2.0 = 102.0$  feet. If the LLE or LAG elevation is equal to or greater than 102.0 feet, the subject may be removed from the SFHA.





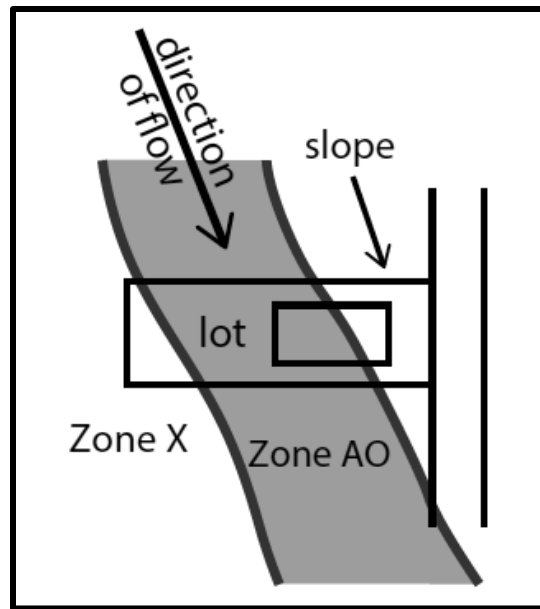
**Figure 15: Zone AO SFHA Contained Primarily in Street**

#### Portion of Property in the SFHA

If the Zone AO flooding inundates a portion of the property, then submitted topographic information must clearly support the position that all flooding flows around and away from the subject of determination. In this scenario, the average surrounding grade within the Zone AO SFHA is compared to the elevation of the subject of determination. The depth of flooding is added to the average grade to obtain a BFE for the area. If the LLE or LAG elevation of the subject is at or above the calculated flood elevation, the subject of determination may be removed from the SFHA.

Example using average grade (Figure 16): Based on a submitted topographic survey containing 10 spot elevations for the inundated portion of the property, an average grade elevation is determined to be 100.5 feet (sum of 10 elevations/10 = 100.5 feet). At this property, the Zone AO flooding has a depth of 3.0 feet, so the BFE to use is:  $100.5 + 3.0 = 103.5$  feet. If the LLE or the LAG elevation is equal to or greater than 103.5 feet, the subject of determination may be removed from the SFHA.

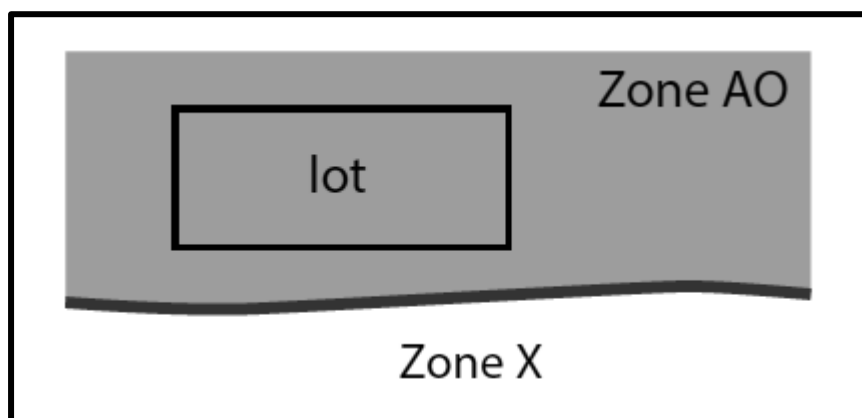




**Figure 16: Portion of Property in Zone AO SFHA**

#### Entire Property in the SFHA (see Figure 17)

If the Zone AO flooding inundates an entire property, the submitted topographic information must clearly support the position that all flooding flows around and away from the property or structure on the property. In this scenario, if it is determined that the flooding would not be confined or conveyed by the surrounding streets, the average surrounding grade is typically used for comparison to the LLE or LAG elevation. The depth of flooding is added to the average grade to obtain a BFE for the area. If the LLE or LAG elevation is at or above the calculated flood elevation, the subject of determination may be removed from the SFHA.



**Figure 17: Entire Property in Zone AO SFHA**

When the Zone AO flooding entirely inundates a property, it may be difficult to conclusively support the position that all flooding flows around and away from the property. Since unimproved land is not



insured by NFIP flood insurance policies, it makes sense to consider requesting a determination for only the proposed or existing structure(s) on a property.

Ultimately, for a subject to be removed from a Zone AO SFHA, it must be clearly demonstrated that flood water flows around and away from the subject and the subject will not be inundated by the depth of the base flood.

If the subject of determination is in a Zone AO SFHA that meets the definition of an alluvial fan, the request must be processed as an MT-2 case (CLOMR or LOMR). Alluvial fan areas are characterized by high-velocity flows, active processes of erosion, sediment transport and deposition, and unpredictable flow paths. On the FIRM, these areas are usually shown as Zone AO with a depth and a velocity. If a subject of determination is in Zone AO with a velocity shown on the FIRM, an MT-1 application may not be processed for that location.

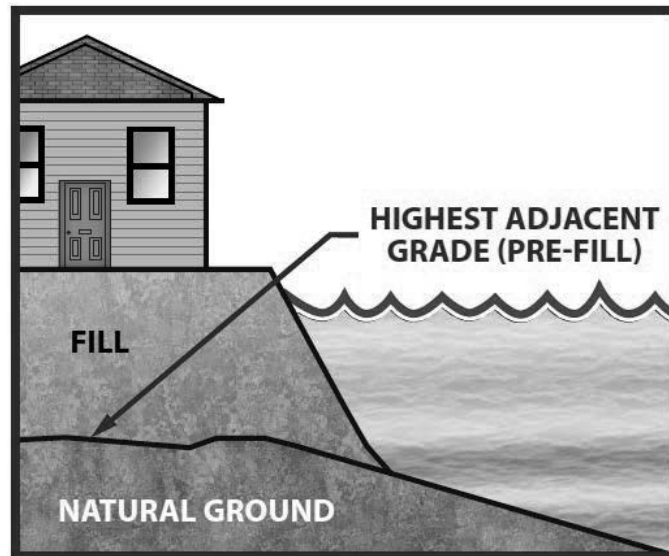
### **Zone AO and Highest Adjacent Grade Considerations**

In some circumstances, the Highest Adjacent Grade (HAG) elevation will be used in the MT-1 review to determine if the low floor elevation of a structure is adequately elevated above the depth of flooding specified for the Zone AO area. The HAG is defined as the highest natural elevation of the ground surface prior to construction that is adjacent to the foundation of a structure. The HAG may be available from the Elevation Certificate for the structure or could be determined from a certified grading plan including a pre-construction topographic survey for the property.

Per 44 CFR 60.3(c)(7), all new construction and substantial improvements of residential structures in Zone AO must elevate the lowest floor (including basement) above the HAG, at least as high as the depth specified in feet on the FIRM. Similarly, 44 CFR 60.3(c)(8) requires non-residential structures to be either elevated or completely floodproofed above the HAG, at least as high as the depth specified in feet on the FIRM.

An MT-1 determination will not be issued if this requirement is not met by new construction or after the substantial improvement of an existing structure.





**Figure 18: HAG for a Structure**

#### 4.8. Metes and Bounds Considerations (Portion of Property)

An MT-1 submittal with the intent of removing a portion of a legally recorded property from the SFHA is known as a metes and bounds request. The required data for a metes and bounds submittal must include:

- A metes and bounds description containing all bearings and distances for a single enclosed area. If the request includes multiple metes and bounds areas, a description for each enclosed area must be included.
- A metes and bounds map showing the area and containing all bearings and distances for the enclosed area.
- Certification of the metes and bounds description and the metes and bounds map. The certification must be completed by a licensed professional eligible to certify survey data.
- The applicable review fee. A multiple-lot fee will be assessed for a portion of property affecting more than one existing or proposed lot or parcel of land.

A good rule to follow when defining an area for removal from the SFHA is to provide an elevation buffer between the LLE for the metes and bounds area and the corresponding BFE. By providing a buffer, a FEMA review is less likely to result in a non-removal determination simply because of a slight difference in the calculation of the BFE. For example, if the BFE is determined to be 100.0 feet, a good rule is to define the metes and bounds area so the LLE of that area is no less than 100.5 feet, or even 101.0 feet, providing a 1-foot buffer. This can avoid portions of the defined area from being below the BFE, which could result in the need to revise the description and accompanying map.



Some requests may require multiple LLEs to be submitted for a metes and bounds area. This usually applies to a metes and bounds area that is large enough for the BFE to change across the property, or an area where the BFE of the flooding source changes rapidly due to the steep gradient of the stream profile. For most MT-1 requests, the BFE is calculated to the tenth of a foot (100.0 feet, 100.1 feet, etc.) so the BFE may not need to change very much for the submitted low-property elevation to be below the upstream BFE. By submitting multiple LLEs along the flooding source, the corresponding BFE at that location can be used for comparison, to determine if the portion of property is eligible for removal from the SFHA using a range of BFEs.

As with all elevation information submitted for an MT-1 application, the elevation(s) submitted for the metes and bounds area must be calculated to a tenth of a foot and must be certified by a licensed professional eligible to certify elevation information.

To avoid an additional data request for a revision to the metes and bounds description and accompanying map, keep in mind the following requirements for the described area:

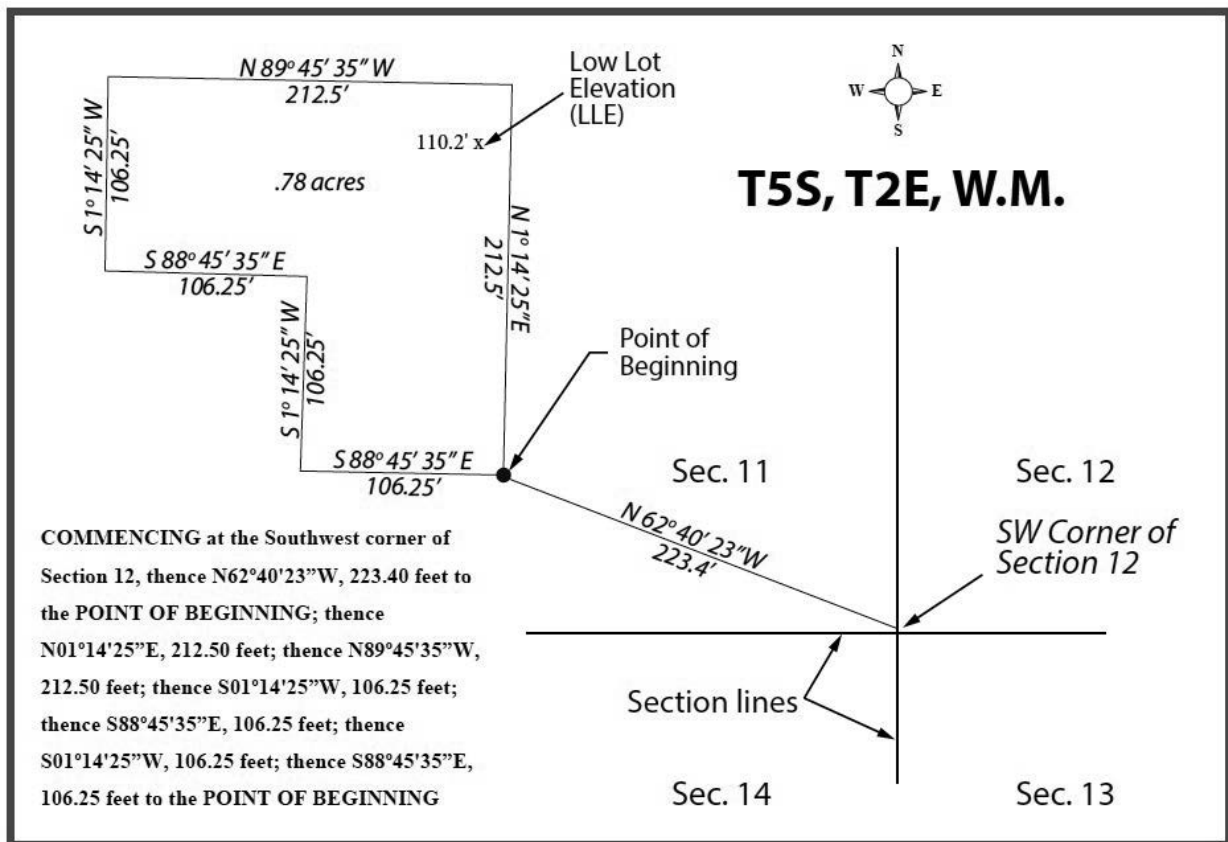
- It should be for the buildable portion of a property.
- It should not be submitted with the intent of removing only the SFHA area shown on the FIRM or with the intent of redefining the SFHA boundary shown on the FIRM.
- It cannot define an area for removal that will create a disconnected SFHA.
- It cannot cut through any portion of a proposed or existing structure. It must include or exclude the entire footprint of the structure, including any attachments.
- It must define an enclosed portion of property.
- It cannot include any portions of water or waterways used to convey water. Any ditch, stream channel, pond, lake, drainage easement or other waterway must be excluded from the metes and bounds area being submitted for removal from the SFHA.
- It cannot define an area of exception (an area to remain within the SFHA).
- It must have a legally identified point of commencement.
- The required map and accompanying description were not submitted or do not match.
- The required map and accompanying description were not certified.
- Bearings and distances are not shown on the accompanying map.
- It should have a buffer in the vertical elevation between the LLE for the metes and bounds area and the corresponding BFE.



- Multiple LLEs may need to be surveyed for comparison to multiple BFEs. This is usually a requirement for large areas or a flooding source with rapidly changing BFEs.
- Metes and bounds description is not submitted in digital format.

The following paragraph shows an example of an appropriate metes and bounds description for a portion of a property to be removed from the SFHA, and Figure 19 shows an appropriate metes and bounds map.

BEGINNING at the northeast corner of Lot 1, as described on the previously referenced and recorded Deed; thence S16°42'22"E, 100.00 feet; thence S33°14'40"W, 145.92 feet; thence S89°13'29"W, 156.01 feet; thence N16°42'22"W, 223.14 feet; thence 210.49 feet along a curve to the left having a radius of 542.00 feet to the POINT OF BEGINNING.



**Figure 19: Example of a Metes and Bounds Description and Map**

#### 4.9. Amend-In Considerations

MT-1 removal determinations are based on detailed elevation information demonstrating that the subject of determination is at or above the BFE. Similarly, submitted elevation information may confirm that a subject adjacent to but outside of the SFHA is actually below the corresponding BFE and would be inundated by the base flood.



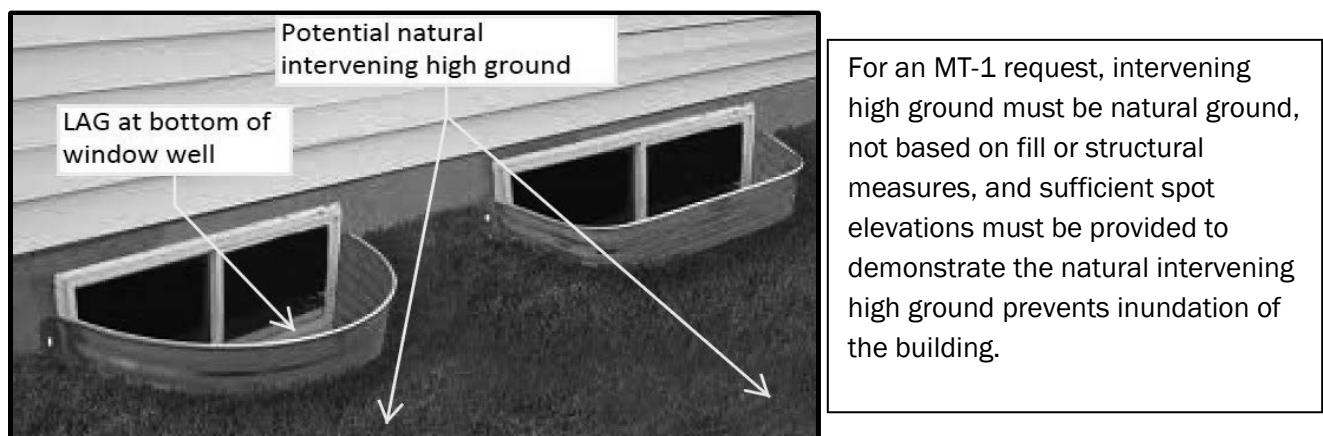
Submitted elevation information for a subject clearly shown outside of the SFHA on the effective FIRM must support an Out as Shown determination. If the elevation information does not support an Out as Shown determination, an Amend-In and Deny (non-removal) determination may be issued.

Before issuing an Amend-In and Deny determination, the potential for naturally occurring intervening high ground is explored to ensure that no high ground prevents the conveyance of the base flood from the flooding source to the subject of determination. See Section 4.10 for more information on reviewing naturally occurring intervening high ground.

#### 4.10. Intervening High Ground Considerations

Naturally occurring high ground can, in limited situations, provide protection from the base flood by preventing the conveyance of the base flood from the flooding source to the subject of determination. To determine that the intervening high ground provides protection from the base flood, several conditions must be met:

- The intervening high ground cannot be based on fill material or on any kind of manmade structure, such as a floodwall, berm, retaining wall, etc. It must be naturally occurring.
- Sufficient data must be submitted to show both the extent and elevation of the intervening high ground. This may require detailed topographic data and/or spot elevations extending beyond the subject property to clearly demonstrate the high ground is sufficient to prevent flood water from going around the high ground and inundating the subject.
- On the submitted form, the elevation for the subject must be the LLE or the LAG elevation—not the elevation of the intervening high ground. Certified comments must be added to the form explaining the presence of naturally occurring intervening high ground and referencing the data submitted in support of the intervening high ground.

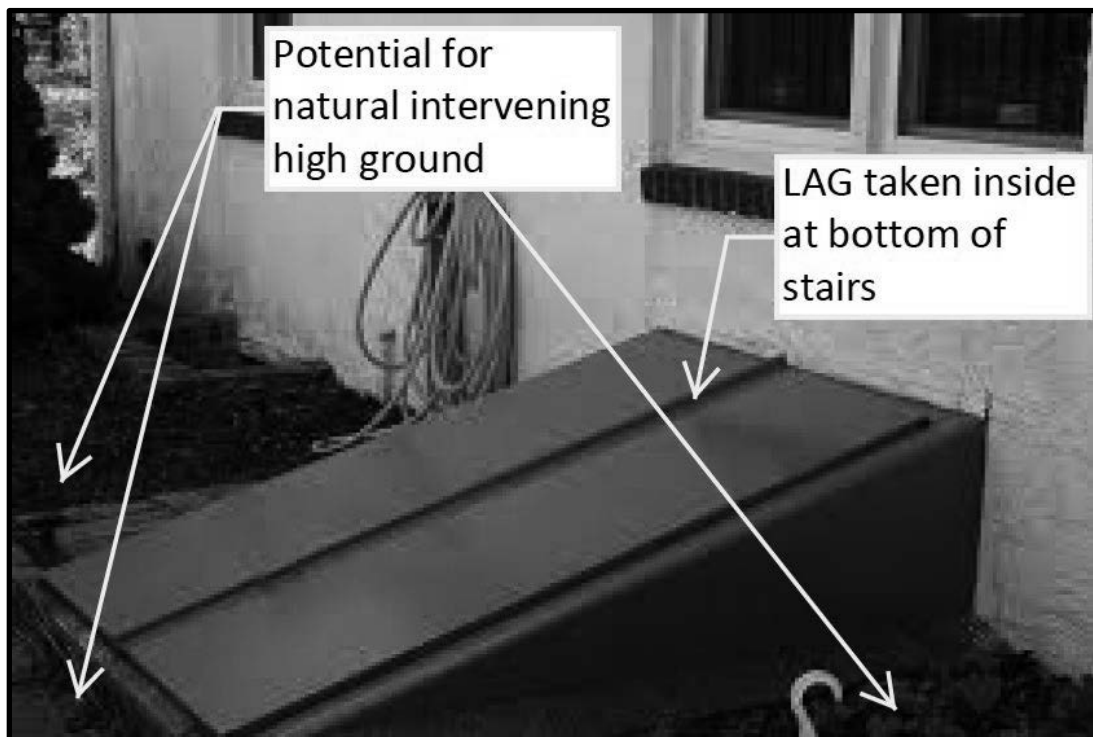


**Figure 20: Use of Intervening High Ground – Window Well**



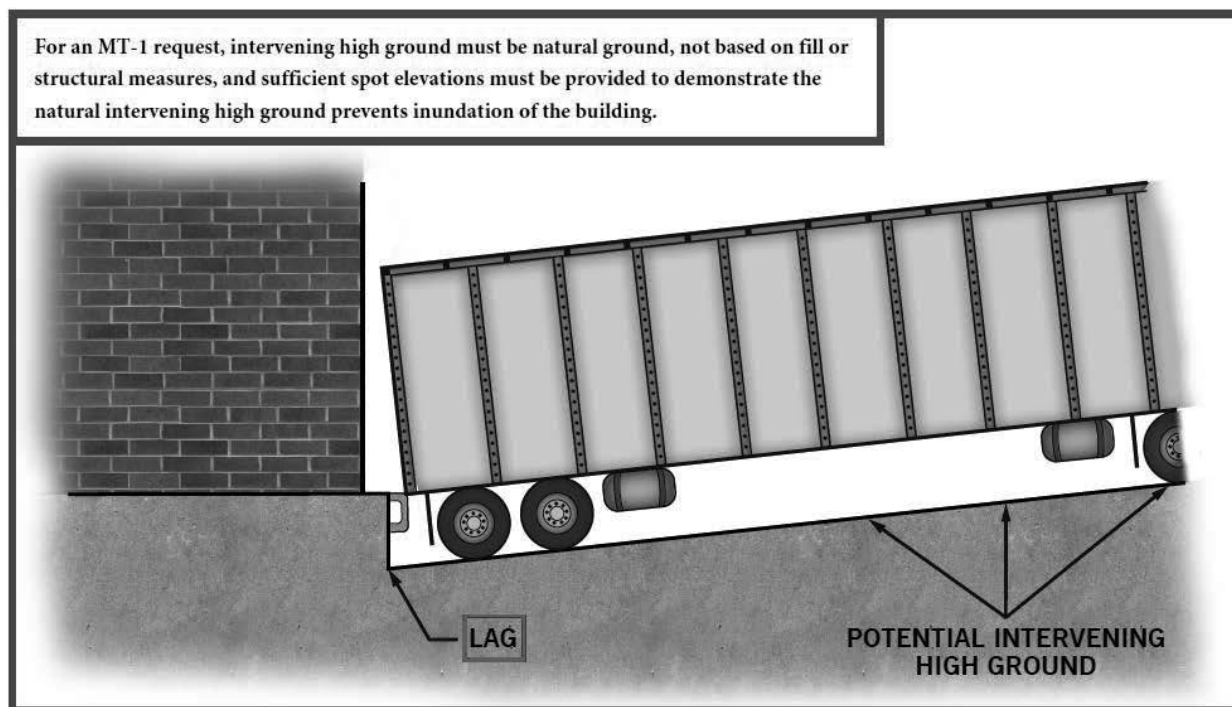


**Figure 21: Use of Intervening High Ground – Loading Dock**



**Figure 22: Use of Intervening High Ground – Covered Basement Stairs**





**Figure 23: Use of Intervening High Ground – Loading Dock**

Since the elevation submitted for a structure's LAG must sometimes be taken at the bottom of a window well, a below-grade stairwell, or a loading dock, the most common example for the use of intervening high ground is when the natural surrounding grade prevents flood water from inundating a structure by entering these types of features.

#### 4.11. Levee-Related Considerations

##### Seclusion

In areas with levee systems, when an updated levee analysis and mapping approach has not been completed, a new FIRM may show an area of seclusion. Seclusion mapping is one option when completing an updated levee analysis will cause a significant delay in the issuance of a new FIRM. Pending completion of the updated analysis and mapping, the area of seclusion can retain the flood hazard information from the current effective FIRM (if the seclusion FIRM has not yet been published) or retain the flood hazard information from the previous effective FIRM (if the seclusion FIRM has been published).

MT-1 determinations are issued within secluded areas. The determination is based on the flood hazard zones shown on the effective FIRM panels and the BFEs listed in the FIS report, even if updated flood hazard information is available in non-regulatory flood risk products. If the levee system is known to be accredited, special wording is inserted into the final document to underscore that within the area of seclusion, the effective flood hazard information has been republished from the previous effective FIRM.



More information on seclusion mapping is available in the FEMA guidance document titled “Levee Seclusion,” available online at: [https://www.fema.gov/sites/default/files/2020-02/Levee\\_Seclusion\\_Guidance\\_Nov\\_2014.pdf](https://www.fema.gov/sites/default/files/2020-02/Levee_Seclusion_Guidance_Nov_2014.pdf).

## **Zone AR**

An AR zone defines an SFHA that used to be designated as Zone B, C or X due to an accredited flood control system. Zone AR defines the area that results from the decertification of a previously accredited flood protection system that is being restored to reduce the risk of the base flood. Unlike Zone A99, Zone AR has no required construction milestones; however, the flood protection system must:

- Have been previously accredited;
- No longer be eligible for accreditation;
- Currently reduce the risk from the flood having at least a 3-percent annual chance of occurring.

Mandatory flood insurance purchase requirements and floodplain management standards apply to properties in Zone AR SFHAs.

MT-1 determinations issued in Zone AR areas are based on a comparison of the LLE or LAG for the subject to the BFE for that area of Zone AR. If a property is in a dual flood zone (e.g., AR/AE), the higher BFE will be used. That would be either the Zone AR BFE or the BFE for the previous or historic risk zone, such as Zone AE.

## **Zone A99**

A Zone A99 SFHA is defined as any area currently subject to inundation by the base flood, but which will ultimately have a reduced risk when an under-construction federal flood protection system is completed. Zone A99 SFHAs are only designated after adequate progress on the construction of a protection system, such as a dike, dam, or levee, has been demonstrated to consider it complete for insurance rating purposes. The criteria for adequate progress are defined in 44 CFR 61.12(b). Zone A99 can be used on a FIRM when the flood protection system has reached the specified statutory progress toward completion. No BFEs or depths are shown for Zone A99 SFHAs. Mandatory flood insurance purchase requirements and floodplain management standards apply.

For MT-1 purposes, a request for a subject in Zone A99 can be reviewed. However, as no BFEs are shown on the FIRM, a BFE must be obtained by using the best available data for the area. The best available data is usually one of the following:

- A historic FIRM of the area, which will be used if the data are determined to be acceptable.
- Preliminary (draft) data, when the data development has been completed sufficiently and reviewed by both FEMA and the affected community and a preliminary map has been issued.



More information on the use of preliminary (draft) data as the best available data can be found in Bulletin 1-98, ["Use of Flood Insurance Study \(FIS\) Data as Available Data."](#) on the FEMA website at [www.fema.gov/media-library/assets/documents/7401](http://www.fema.gov/media-library/assets/documents/7401).

- When available, information from a levee analysis can be used to determine if the subject is at or above the elevation of the natural valley analysis.

## **Zone D**

Zone D is used for areas where no detailed analysis of flood hazards has been conducted, and where there are possible, but undetermined, flood hazards. Zone D is not considered an SFHA, and flood insurance is not federally required in Zone D. However, if a lender believes that property damage from flooding is possible, the lender has the prerogative of requiring flood insurance as a condition of the loan. Flood insurance is available under the NFIP for structures in Zone D.

Zone D is used primarily to map the following areas, which have a possible but uncertain risk of flooding:

- Areas associated with non-accredited levee systems with the possibility for failure.
- Areas where no detailed analysis of flood hazards has been completed.

The MT-1 process cannot be used to remove the Zone D designation from a subject. The normal response to an MT-1 request for a subject within Zone D is a letter confirming the subject is within Zone D. The letter also notes that the applicant may apply through the MT-2 process to have the map physically revised and that all requests for map revisions must be submitted through the local community.

## **4.12. Below-Grade Parking Considerations**

There are special requirements for structures with a below-grade parking garage that may allow an MT-1 LOMC to be processed.

- This process applies only to buildings in SFHAs for most flood zones beginning with A (A zones) and is not recommended for Zone AO or coastal Zone AE SFHAs.
- The building must be non-residential or meet the definition of a mixed-use building. It must meet all other requirements specified in FEMA Technical Bulletin 6-93, titled "Below-Grade Parking Requirements."
- The building must be professionally designed, and all residential-use areas must be at or above the BFE.
- The below-grade parking area must only be used for parking, storage and/or building access.



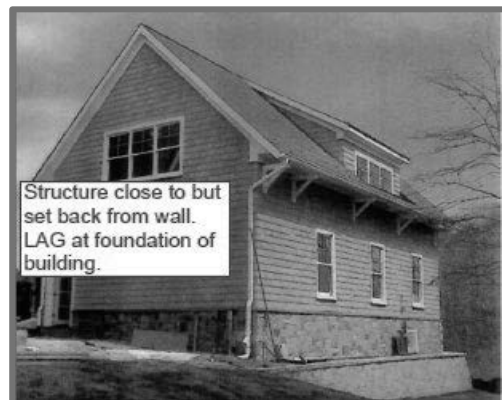
- The below-grade parking area (below the BFE) must be dry-floodproofed as specified in FEMA Technical Bulletin 3-93, titled “Non-Residential Floodproofing-Requirements and Certification.”

#### 4.13. Special Considerations for Physical Changes to Increase the LAG or to Provide Flood Protection

Fill placement to elevate a buildable property or portion of property to or above the BFE is normally limited to the period prior to the construction of any improvements (buildings). Fill placed around an existing building with the intent of modifying the LAG is not recommended and may result in a potential violation of the NFIP regulations. Additionally, physical changes with the intent of providing flood protection are normally limited to the MT-2 (LOMR or CLOMR) review process.

Some additional details on physical changes:

- If a building is set back from a retaining wall used to support fill, an MT-1 review is usually possible; the LAG is usually taken at the foundation of the building (Figure 24). However, specific designs may be subject to an additional FEMA review and could determine a more appropriate location for the LAG.
- If the foundation of a building is dependent on a retaining wall for structural support of the building (on top of the wall), then the LAG will usually be taken at the lowest point where the ground touches the retaining wall (Figure 25). This will normally result in a non-removal determination/comment.
- Retrofitting an existing structure to elevate the LAG might be possible with adequately placed fill material that is compacted and appropriately sloped. Most other modifications will not be acceptable to change the LAG, including a “sandwich” of fill supported entirely by a retaining wall or the placement of a curb along an existing foundation (Figure 26). Before a property owner starts any construction or modifications, including fill placement, the local official responsible for floodplain management (floodplain administrator or manager) must be consulted to ensure the proposed project will meet all local and state floodplain management requirements, including any local standards that are more restrictive than the federal minimum requirements. Additionally, the property owner should submit a CLOMR-F request to FEMA for review prior to starting any modification. This may avoid costly modifications that ultimately will not be acceptable for elevating the LAG of an existing building.



**Figure 24: Set Back from Wall**



**Figure 25: On Top of Wall**





**Figure 26: Not an Acceptable Retrofit Option to Modify the LAG**

## 5. Light Detection and Ranging Letter of Map Amendment

LiDAR, an acronym for Light Detection and Ranging, is a remote sensing technology that is capable of efficiently creating accurate topographic data on a large scale. FEMA accepts LOMA applications using elevations based on LiDAR data. Because this process involves a greater level of uncertainty, homeowners should be aware that the LiDAR data may not fully capture their flood risk.

For submittals using contours based on LiDAR data, FEMA will subtract one-half of the contour interval or 1 foot, whichever is greater, from the lowest contour closest to the structure or property (but not going through it), to account for the nature of this data. For structures or properties that cannot be removed with this method, certified elevations will be required. For submittals using LiDAR point data, FEMA will subtract 2 feet from the lowest point immediately adjacent to the structure (to determine the LAG) or on the property (to determine the LLE). For structures or properties where FEMA has already been provided certified elevation data (typically in the form of an Elevation Certificate or site survey), the certified data will be used in lieu of LiDAR.

FEMA has standardized Quality Level 3 data, as defined by the USGS. Quality Level 3 was selected to help ensure that the LiDAR data are accurate without being so restrictive that most existing datasets could not be used. Where more precise data are available, it can also be used for these products. In addition, the LiDAR data must be publicly available and be accessible free of charge online. The owner of the data must be a federal, state, local, or tribal government entity.

### 5.1. Exclusions

LiDAR cannot be used for several categories of submissions:

- No requests involving fill.



- No requests involving structures that are still under construction (LiDAR would need to show that the whole property or a portion of the property was removable).
- No conditional requests.
- No requests involving subjects mapped in the regulatory floodway.
- No requests involving CHHAs (Zones V, VE, or V1-V30).
- No requests involving Zones AO, AR or A99.
- No requests where the FIRM clearly shows the property/structure to be outside the SFHA.
- No requests involving the resolution of potential violations identified through the LOMC process.
- No requests involving physical changes to the flooding source/SFHA that require revision to the FIRM.
- No eLOMA requests.
- No requests to supersede LOMCs based on certified elevation data.

## **5.2. Exhibit Requirements for MT-1 Requesters**

An applicant requesting that a LOMA determination be evaluated based on LiDAR data must submit a paper map or digital PDF exhibit that displays either: (1) an overlay of the LiDAR contours or (2) an overlay of the LiDAR points, both of which must use an aerial image of the structure/property in question.

The exhibit must contain the following data:

- Scale.
- North arrow.
- Address/Assessor's Parcel Number (APN) for structure/property in question.
- Clearly identified subject of determination. At least one street intersection visible on the exhibit, as applicable.
- Name, organization and contact information for the map overlay creator.
- Aerial imagery that correctly represents the footprint of the structure.
- Date the LiDAR was collected.
- Source of the LiDAR data (federal, state, community, etc.), to include the public website address.



- LiDAR accuracy information.
- Location of the data archive or metadata file (must be available for independent verification through a publicly available website or metadata).
- Vertical Datum.

The following information is not required to be provided with the submitted paper map or digital PDF exhibit, but it would be helpful to the analyst reviewing the application:

- Latitude and longitude, in decimal degrees to 6 decimal places, at the center of the subject.
- Effective FIRM panel number and effective date.
- SFHA boundaries.
- Stream centerline.
- Date of aerial imagery.
- Date map overlay was made.

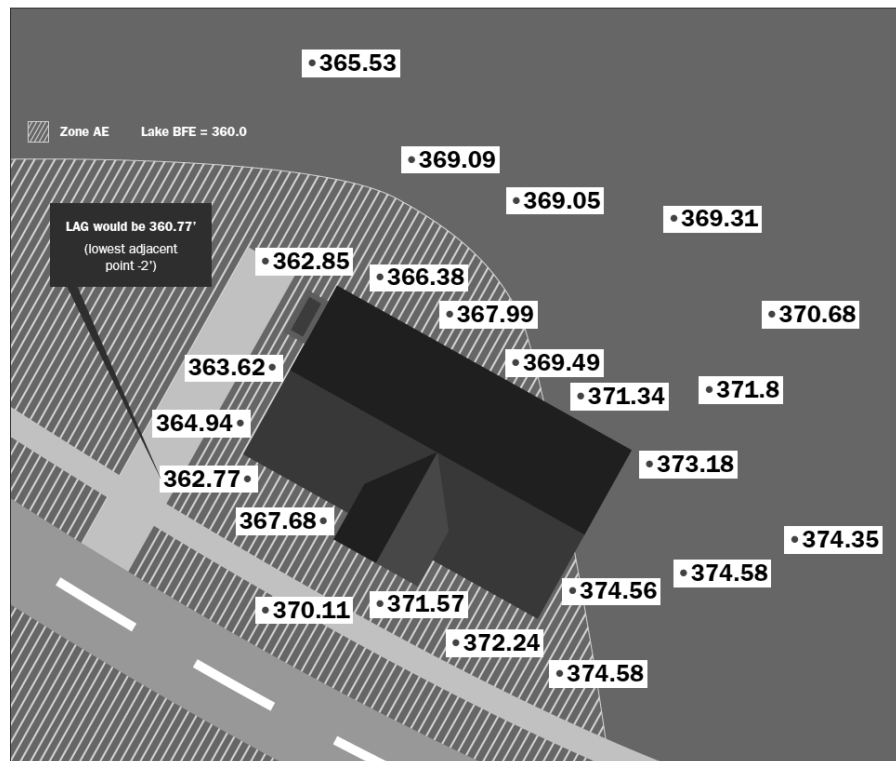
Please note that this exhibit can be created from multiple sources, including local and state government and federal agencies, that have collected LiDAR and other needed data.

Where LiDAR contours are available, the exhibit must contain the following data:

- LiDAR contours illustrated in 1- or 2-foot contour intervals, with accuracy and vertical datum information.

Where LiDAR contours are not available, in lieu of the LiDAR contours noted above, the exhibit may depict the point cloud, with elevations labeled, that would be used to determine the LAG or LLE. The point density must be sufficient, and the labeled elevations need to be uniformly spaced throughout the subject property to adequately portray changes in elevations. All other exhibit requirements noted above are also required. Figure 27 is an example of this type of exhibit.





**Figure 27: Example of Point Cloud Depiction**

In addition to the exhibit, the requester must furnish all other necessary data, including the MT-1 forms, to complete the request. Exhibits can be provided for multiple lot requests, as long as the other required elements are provided for each property. Very large requests might be better handled through multiple LOMAs or the MT-2 process; when this is suspected, FEMA will decide how best to handle the change prior to issuing a determination.

If an Elevation Certificate is provided or has been previously provided for the subject property, the Elevation Certificate will be used in lieu of the LiDAR data. For determinations that have already been issued, Elevation Certificate data will also be required in lieu of the LiDAR data.

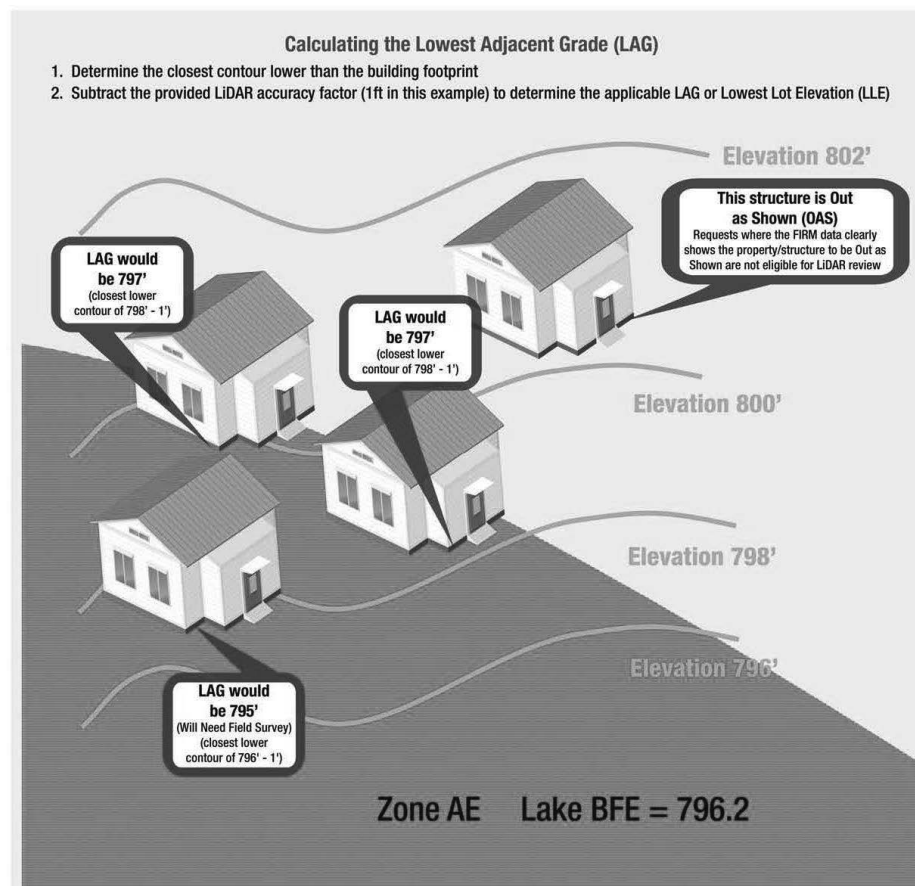
### 5.3. Processing Procedures

LiDAR-based submissions will be reviewed based on the following criteria:

- The LOMA analyst will review the submitted exhibit to determine the location of the structure/property in question and identify the elevation data to be assessed.
- Contour submittals: The analyst will identify the lowest contour immediately adjacent to the subject (but not going through it) and subtract one-half the contour interval or 1 foot, whichever is greater, from the lowest contour closest to the structure or property (see Figure 23) to determine the applicable LAG elevation or LLE. This elevation will be compared to the BFE.



- LiDAR point submittals: The analyst will identify the lowest point immediately adjacent to the structure or on the property and subtract 2 feet to determine the LAG or the LLE.
- If the comparison of the LAG or LLE to the BFE results in a removal and all other required data were submitted, a determination can be issued. The LAG/LLE, and possibly the BFE as well, will not be published with the determination. If additional data are required to process the request (i.e., submittal form, deed, plat), it will be requested to complete the determination.
- If the comparison of the LAG/LLE to the BFE results in a non-removal, certified elevations will be requested in addition to any other data needed for the request.



## 5.4. BFE Development Procedures

For properties in flood zones without published BFEs, the applicant should provide any data that are available to determine the BFE. When data are not available, FEMA will determine the BFE based on the best available data. It should be noted that these BFE determinations are often conservative, and any information that is provided may assist in determining the BFE.



## **5.5. Disclaimer**

All cases issued using LiDAR in lieu of certified elevations will include the following disclaimer:

This determination is based on LiDAR topographic data showing the elevation of the subject property. The elevation data that were used are not certified by a Licensed Land Surveyor or Professional Engineer, but they meet or exceed FEMA requirements. This determination is subject to change if more detailed data becomes available.

## **5.6. Data Request Paragraphs**

Use the paragraphs below when an applicant indicates the submittal is a LiDAR LOMA but did not submit a LiDAR exhibit.

FEMA now accepts LiDAR (Light Detection and Ranging) data in lieu of certified elevations, where applicable. A LiDAR overlay meeting FEMA specifications must be prepared. Please refer to the “Elevation Guidance” for complete LiDAR overlay requirements. Contact your community to determine LiDAR availability and for assistance in preparing the LiDAR overlay.

If the case is not eligible for a LiDAR LOMA (i.e., it is one of the ineligible case types), use the standard paragraph for requesting certified elevations.

The Elevation Information Form (Form 2) must be included for all requests except those in which the Flood Insurance Rate Map (FIRM) already shows the property and structure to be CLEARLY outside the SFHA. For cases in which the determination for the structure is uncertain, elevation data must be submitted to provide a definitive determination. This form must be completed by a licensed land surveyor or registered professional engineer. If an Elevation Certificate has been completed for a structure(s), it may be submitted in lieu of this form. The Elevation Certificate must be certified by a licensed land surveyor or registered professional engineer.

Use the paragraph below when submitted LiDAR data does not result in a removal because the elevation is below the BFE with or without the subtracted value.

Upon review of the submitted LiDAR data, more detailed elevation information is needed to proceed with your request. Please submit an Elevation Information Form (Form 2), completed by a licensed land surveyor or registered professional engineer. If an Elevation Certificate has been completed for a structure, it may be submitted in lieu of this form. The Elevation Certificate must be certified by a licensed land surveyor or registered professional engineer.

## **5.7. Revalidations**

LOMAs that are superseded by a map update will need to go through the revalidation process to determine whether they are still valid. If the LiDAR is still valid, the case can go through the normal revalidation process and possibly remain valid. Where new LiDAR has been used for the map update, the LOMA may be superseded or need to be redetermined.



## 6. Glossary

Most of the definitions listed in this section, as well as additional definitions applicable to the NFIP, can be found at 44 CFR 59.1.

**Alluvial Fan** is a sedimentary deposit located at a topographic break, such as the base of a mountain front, escarpment or valley side, that is composed of streamflow and/or debris flow sediments and has the shape of a fan, either fully or partially extended. These characteristics can be categorized by composition, morphology and location.

**Alluvial Fan Flooding** is flooding occurring on the surface of an alluvial fan or similar landform which originates at the apex and is characterized by high-velocity flows; active processes of erosion, sediment transport and deposition; and unpredictable flow paths. Alluvial fan flooding is depicted on a FIRM as Zone AO, with a flood depth **and** velocity.

**Amendment** is a change to an NFIP map that removes an area that was inadvertently included in the SFHA.

**Area of Shallow Flooding** is an area designated Zone AO, AH, AR/AO, AR/AH, or VO on a community's FIRM with a 1 percent or greater annual chance of flooding to an average depth of 1 to 3 feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

**Base Flood** is the flood having a 1-percent chance of being equaled or exceeded in any given year.

**Base Flood Elevation (BFE)** is the elevation of the flood having a 1-percent chance of being equaled or exceeded in any given year.

**Basement** means any area of the building having its floor subgrade (below ground level) on all sides.

**Coastal High Hazard Areas (CHHAs)**, identified as Zone V or VE, are SFHAs that extend from offshore to the inland limit of a primary frontal dune along an open coast, and any other area subject to high-velocity wave action from storms or seismic sources. Typically, these are the areas where the computed wave heights for the base flood are 3 feet or more. CHHAs are subject to more stringent building requirements and different flood insurance rates than other zones shown on the FIRM, because they have a higher level of risk than other areas.

**Coastal AE Zone** is the portion of the SFHA landward of a V zone (i.e., coastal areas where wave heights are computed to be less than 3 feet), mapped as Zone A or AE on the FIRM. While the wave forces in coastal A zones are not as severe as those in V zones, the capacity for wave action to damage or destroy buildings is still present.

**Comment Document** is a conditional document issued by FEMA that makes a comment on proposed fill to be placed on a lot or portion of a lot, or on the construction of proposed structure(s). The document does not make a final flood zone determination and, to remove the SFHA designation, it



must be followed by a final determination document from FEMA once construction is complete (fill placed or structure finished). While a community may use the comment document for a proposed project as part of their permitting process, the NFIP or a lender may not use it to waive the federal requirement for flood insurance.

**Date of Construction** is the date a structure was completed. For MT-1 application purposes, this is normally the date the final grading for a structure was completed. If an MT-1 application is for a structure, the date of construction must be provided on the application.

**Detailed Flood Zone or Flood Hazard Area** refers to a flood zone where BFEs have been established and are shown on the FIRM; the FIRM may be accompanied by an FIS report containing more detail.

**Development** means any manmade 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.

**Fill** is defined as material from any source (including the subject property) placed to raise the ground (natural grade) to or above the BFE. The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing (natural grade) elevation, which is at or above the BFE. Fill that is placed before the date of the first NFIP map showing the area in an SFHA is considered natural grade.

A **Flood Hazard Boundary Map** is an official map of a community, issued by the Federal Insurance Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) and related erosion areas having special hazards have been designated as Zones A, M, and/or E.

A **Flood Insurance Rate Map (FIRM)** is an official map of a county or community on which SFHAs and other applicable risk zones are delineated.

A **Flood Insurance Study (FIS) report** is a compilation and presentation of flood risk data for specific watercourses, lakes and coastal flood hazard areas within a county or community. When a flood study is completed for the NFIP, the information and maps are assembled into an FIS report. The report contains detailed flood elevation data in flood profiles and data tables, which can be critical in determining an accurate BFE for MT-1 subjects.

**Floodplain Management** is the operation of an overall program of corrective and preventive measures for reducing flood damage, including emergency preparedness plans, flood control works, and floodplain management regulations.

**Floodplain Management Regulations** include zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications. The term describes state or local regulations, in any combination, which provide standards for the purpose of flood damage prevention and reduction.



**Floodway** – see Regulatory Floodway.

**Flood Zone**, for the purposes of this document, refers to an identified SFHA as defined and mapped on a community's effective FIRM. Numerous flood zones can be labeled on a FIRM, including Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone D, Zone V, Zone VE and Zones V1- V30. More information on these flood zones can be found at [www.fema.gov/flood-zones](http://www.fema.gov/flood-zones).

**Highest Adjacent Grade (HAG)** means the highest natural elevation of the ground surface prior to construction and adjacent to the proposed walls of a structure.

**Letters of Map Change (LOMCs)** are documents issued by FEMA that revise or amend the flood hazard information shown on the FIRM without requiring the FIRM to be physically revised and republished. LOMCs include determinations/comments issued as part of the MT-1 or MT-2 processes.

**Light Detection and Ranging (LiDAR)** is a method for remotely collecting elevation information using an instrument that measures distance to a reflecting object by emitting timed pulses of laser light and measuring the time between emission and reception of reflected pulses. Additional information on LiDAR can be found through [FEMA's YouTube series](#) .

**Lowest Adjacent Grade (LAG)** is the elevation of the lowest ground touching a structure, including attached patios, stairs, window wells, loading docks, deck supports or garages. The elevation must be provided to the nearest tenth (0.1) of a foot or meter (only meters if the FIS/FIRM is in meters).

- The LAG is only necessary when the subject is a proposed or existing structure.
- The LAG is the primary elevation used to determine whether a structure can be removed from the SFHA.
- The LAG includes any attached accessory, such as a garage attached to the main residence by a breezeway or two structures attached by a utility or pedestrian bridge. If structures are attached, the LAG needs to be the lowest ground touching the entire structure joined by any structural feature (bridge, breezeway, deck, etc.).
- The LAG includes any support for any portion of the structure and must include the ground elevation at the point where any piers, posts, or columns touch the ground. Any structure having a supporting member entirely or partially within a body of water will not be removed from the SFHA.
- The LAG must include the supports for any attached deck or stairs. When completing an Elevation Certificate, this elevation must be entered as Item C2.h).

**Lowest Lot Elevation (LLE)** is the lowest elevation of a legally recorded property or the lowest elevation of a portion of a legally recorded property as defined by a metes and bounds description.



For an MT-1 application, the LLE must be accompanied by a map. The elevation must be provided to the nearest tenth (0.1) of a foot or meter (only in meters if the FIS/FIRM is in meters).

**Lowest Floor** means the lowest floor of the lowest enclosed area (including a basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor, provided that the enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of 44 CFR 60.3.

The **Mapping Information Platform (MIP)** is a digital warehouse and production tool that provides the tools for digital flood map production. FEMA mapping partners can create, validate, store, track and update digital flood data using the MIP workflow process.

**Metes and Bounds Description** is a series of bearings and distances, referenced to a defined point and describing a closed area of property. A metes and bounds description and accompanying map must be submitted for MT-1 requests requiring a determination on a portion of a legally recorded property. The description must be accompanied by a metes and bounds map showing the area. Both the description and the map must be certified by a licensed professional eligible to certify survey data, such as a Professional Engineer or Licensed Land Surveyor.

**Metes and Bounds Map** – see Metes and Bounds Description

**The National Flood Insurance Program (NFIP)** was created by the U.S. Congress in 1968 with the goal of reducing future flood losses through the adoption of local floodplain management regulations and to provide protection for property owners against potential losses through an insurance mechanism that allows a premium to be paid for the protection of those who need it most.

**Regulatory Floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water-surface elevation more than a designated height.

**Special Flood Hazard Area (SFHA)** is the land in the floodplain that is subject to inundation by the flood having a 1 percent or greater chance of occurring in any given year. The area may be designated as Zone A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, or V. For purposes of this document, the term SFHA is synonymous with the phrase “area of special flood hazard.”

**Structure**, for floodplain management purposes, means a walled and roofed building. The definition includes a gas or liquid storage tank that is principally above ground, as well as a manufactured home.

**Structure**, for insurance purposes, means:

- A building with two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site.



- A manufactured home (also known as a mobile home), which is a structure built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation).
- A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws.
- (Structure does not mean a recreational vehicle or a park trailer or other similar vehicle, except as described in the previous bullet, or a gas or liquid storage tank).

**Subject of Determination (Subject)**, for purposes of an MT-1 application, is the specific area/item for which a flood zone determination is being requested. The subject is specified by the requester and can be any of the following:

- An entire legally defined property (recorded deed or plat).
- A portion of a legally defined property, as defined by a metes and bounds description with accompanying map.
- An existing structure (construction date must be provided).
- A proposed structure (proposed date of construction must be provided).

**Pre-FIRM development** is defined as any development occurring prior to the effective date of the first FIRM for a community. This means the development occurred before the community received detailed flood hazard data and usually before the community enacted comprehensive regulations on floodplain management. Pre-FIRM development is not subject to MT-1 fees or “based on fill” requirements.

**Vertical Datum** refers to a common vertical elevation reference system. Two primary reference systems are currently used within the United States: National Geodetic Vertical Datum of 1929 (NGVD 29) and North American Vertical Datum of 1988 (NAVD 88). All elevation data submitted with an MT-1 application must be converted to the same vertical datum used for the effective FIS.

## 7. Existing Guidance and Resources

MT-1 Application Forms (June 2012) and Instructions (April 2017)

<https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1>

MT-EZ Form (June 2012) and Instructions (April 2017)

<https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-ez>

Elevation Certificate and Instructions (2019 Edition)



[https://www.fema.gov/sites/default/files/2020-07/fema\\_nfip\\_elevation-certificate-form-instructions\\_feb-2020.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_nfip_elevation-certificate-form-instructions_feb-2020.pdf)

#### Code of Federal Regulations Title 44

[https://www.ecfr.gov/cgi-bin/text-idx?SID=16b1d3053748084c6955acc3e6b24ceb&mc=true&tpl=/ecfrbrowse/Title44/44cfrv1\\_02.tpl#0](https://www.ecfr.gov/cgi-bin/text-idx?SID=16b1d3053748084c6955acc3e6b24ceb&mc=true&tpl=/ecfrbrowse/Title44/44cfrv1_02.tpl#0)

#### FEMA Policy Standards for Flood Risk Analysis and Mapping

<https://www.fema.gov/media-library/assets/documents/35313>

#### Technical Bulletins

<https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins>

#### Higher Floodplain Management Standards – Fact Sheets

<https://www.fema.gov/floodplain-management/manage-risk/local>





**FEMA**

*NATIONAL FLOOD INSURANCE PROGRAM*

# **ELEVATION CERTIFICATE**

**AND**

**INSTRUCTIONS**

**2019 EDITION**



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

## ELEVATION CERTIFICATE AND INSTRUCTIONS

### Paperwork Reduction Act Notice

Public reporting burden for this data collection is estimated to average 3.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20742, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

### Privacy Act Statement

**Authority:** Title 44 CFR § 61.7 and 61.8.

**Principal Purpose(s):** This information is being collected for the primary purpose of estimating the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

**Routine Use(s):** The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 73 Fed. Reg. 77747 (December 19, 2008); DHS/FEMA/NFIP/LOMA-1 – National Flood Insurance Program (NFIP) Letter of Map Amendment (LOMA) System of Records Notice 71 Fed. Reg. 7990 (February 15, 2006); and upon written request, written consent, by agreement, or as required by law.

**Disclosure:** The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or the applicant may be subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

### Purpose of the Elevation Certificate

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate Post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO. The Elevation Certificate is not required for Pre-FIRM buildings unless the building is being rated under the optional Post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management regulations that specify minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in FEMA Publication 467-1, Floodplain Management Bulletin: Elevation Certificate, available on FEMA's website at <https://www.fema.gov/media-library/assets/documents/3539?id=1727>.



# ELEVATION CERTIFICATE

**Important:** Follow the instructions on pages 1–9.

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:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.					Company NAIC Number:	
City		State		ZIP Code		
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)						
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)						
A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: <input type="checkbox"/> NAD 1927 <input type="checkbox"/> NAD 1983						
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.						
A7. Building Diagram Number _____						
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? <input type="checkbox"/> Yes <input type="checkbox"/> No						
A9. For a building with an attached garage:						
a) Square footage of attached garage _____ sq ft						
b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____						
c) Total net area of flood openings in A9.b _____ sq in						
d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No						
SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION						
B1. NFIP Community Name & Community Number			B2. County Name		B3. State	
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/ Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth)	
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input 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 type="checkbox"/> Other/Source: _____						
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA						



# ELEVATION CERTIFICATE

OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

## 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. In Puerto Rico only, enter meters.

Benchmark Utilized: \_\_\_\_\_ Vertical Datum: \_\_\_\_\_

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: \_\_\_\_\_

Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

- |   |       |                               |                                 |
|---|-------|-------------------------------|---------------------------------|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor)   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| b) Top of the next higher floor   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| c) Bottom of the lowest horizontal structural member (V Zones only)   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| d) Attached garage (top of slab)  | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| e) Lowest elevation of machinery or equipment servicing the building<br>(Describe type of equipment and location in Comments) | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG)  | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG)   | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support                                  | _____ | <input type="checkbox"/> feet | <input type="checkbox"/> meters |

## SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. *I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No ☐ Check here if attachments.

Certifier's Name	License Number	<b>Place Seal Here</b>
Title		
Company Name		
Address		
City	State ZIP Code	

Signature \_\_\_\_\_ Date \_\_\_\_\_ Telephone \_\_\_\_\_ Ext. \_\_\_\_\_

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

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



# ELEVATION CERTIFICATE

OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

## SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawlspace, or enclosure) is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- b) Top of bottom floor (including basement, crawlspace, or enclosure) is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the LAG.
- E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E3. Attached garage (top of slab) is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

## SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name

Address City State ZIP Code

Signature Date Telephone

Comments

☐ Check here if attachments.



# ELEVATION CERTIFICATE

OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

## SECTION G – COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

- G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3. ☐ The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate of Compliance/Occupancy Issued
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G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: \_\_\_\_\_ ☐ feet ☐ meters Datum \_\_\_\_\_

G9. BFE or (in Zone AO) depth of flooding at the building site: \_\_\_\_\_ ☐ feet ☐ meters Datum \_\_\_\_\_

G10. Community's design flood elevation: \_\_\_\_\_ ☐ feet ☐ meters Datum \_\_\_\_\_

Local Official's Name	Title
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Community Name	Telephone
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Signature	Date
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Comments (including type of equipment and location, per C2(e), if applicable)

☐ Check here if attachments.



# BUILDING PHOTOGRAPHS

See Instructions for Item A6.

OMB No. 1660-0008

Expiration Date: November 30, 2022

## ELEVATION CERTIFICATE

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.

Photo One

Photo One

Photo One Caption

Clear Photo One

Photo Two

Photo Two

Photo Two Caption

Clear Photo Two



# ELEVATION CERTIFICATE

## BUILDING PHOTOGRAPHS

Continuation Page

OMB No. 1660-0008

Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.

Photo Three

Photo Three

Photo Three Caption

Clear Photo Three

Photo Four

Photo Four

Photo Four Caption

Clear Photo Four



## Instructions for Completing the Elevation Certificate

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

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### SECTION A – PROPERTY INFORMATION

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**Items A1–A4.** This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

**Item A5.** Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, –110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", –110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 5 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. When the latitude and longitude are provided by a surveyor, check the "Yes" box in Section D and indicate the method used to determine the latitude and longitude in the Comments area of Section D. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

**Item A6.** If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least 2 photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. To the extent possible, these photographs should show the entire building including foundation. If the building has split-level or multi-level areas, provide at least 2 additional photographs showing side views of the building. In addition, when applicable, provide a photograph of the foundation showing a representative example of the flood openings or vents. All photographs must be in color and measure at least 3" × 3". Digital photographs are acceptable.

**Item A7.** Select the diagram on pages 7–9 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a–h. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

**Item A8.a.** Provide the square footage of the crawlspace or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawlspace or enclosure(s). Examples of elevated buildings constructed with crawlspace and enclosure(s) are shown in Diagrams 6–9



## Instructions for Completing the Elevation Certificate (continued)

on pages 8–9. Diagrams 2A, 2B, 4, and 9 should be used for a building constructed with a crawlspace floor that is below the exterior grade on all sides.

**Items A8.b–d.** Enter in Item A8.b the number of permanent flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. Indicate in Item A8.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the crawlspace or enclosure(s) have no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter "N/A" for not applicable in Items A8.b–c.

**Item A9.a.** Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

**Items A9.b–d.** Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. Indicate in Item A9.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the garage has no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter "N/A" for not applicable in Items A9.b–c.

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

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Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building's location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community's FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the county or new county, if necessary, in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

If the map in effect at the time of the building's construction was other than the current FIRM, and you have the past map information pertaining to the building, provide the information in the Comments area of Section D.

**Item B1.** NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the *NFIP Community Status Book*, available on FEMA's web site at <https://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book>, or call 1-800-358-9616.



## Instructions for Completing the Elevation Certificate (continued)

**Item B2.** County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter "unincorporated area." For an independent city, enter "independent city."

**Item B3.** State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

**Items B4–B5.** Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a 4-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

**Item B6.** FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

**Item B7.** FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

**Item B8.** Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1–A30, V, VE, V1–V30, AH, AO, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

**Item B9.** Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than 1 flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1–A30, AE, AH, V1–V30, VE, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Item B10.** Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

**Item B11.** Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

**Item B12.** Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. Information about CBRS areas and OPAs may be obtained on the FEMA web site at <https://www.fema.gov/national-flood-insurance-program/coastal-barrier-resources-system>.

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

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Complete Section C if the building is located in any of Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawlspaces to shoot the elevation of the crawlspace floor. If access to the crawlspace is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawlspace to the "next higher floor," and then subtract the crawlspace height from the elevation of the "next higher floor." If there is no access to the



## Instructions for Completing the Elevation Certificate (continued)

crawlspace, use the exterior grade next to the structure to measure the height of the crawlspace to the "next higher floor."

- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawlspace floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawlspace floor to the next higher floor, try to verify this by looking inside the crawlspace through any openings or vents.

In all 3 cases, use the Comments area of Section D to provide the elevation and a brief description of how the elevation was obtained.

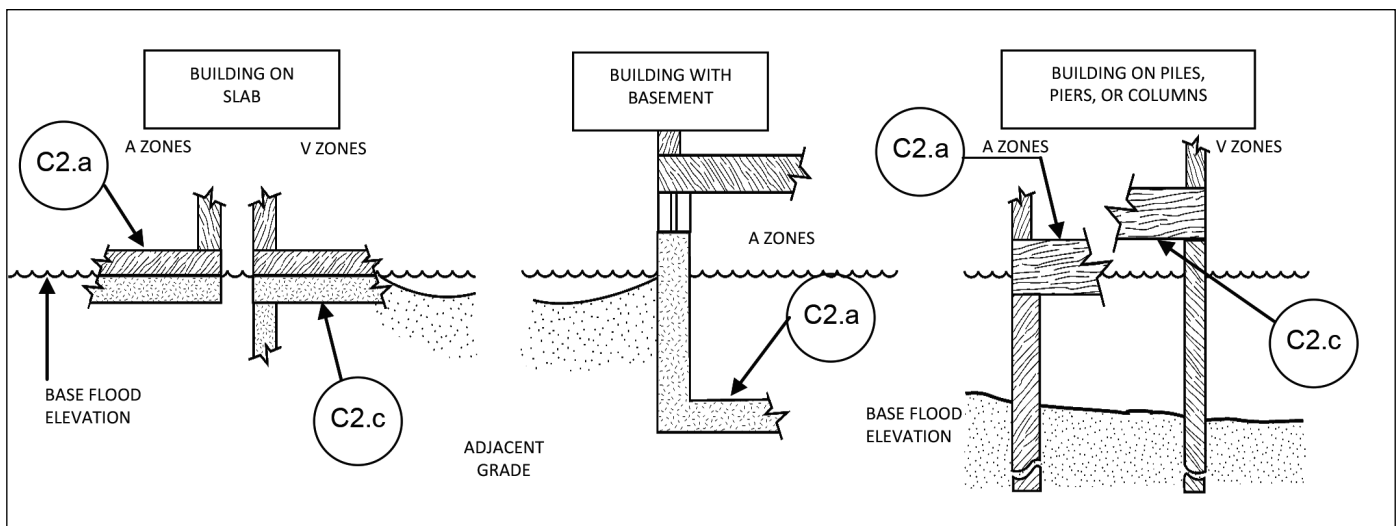
**Item C1.** Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first 2 choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a–h. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

**Item C2.** A field survey is required for Items C2.a–h. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other unique identifier assigned by the maintainer of the benchmark. For GPS survey, indicate the benchmark used for the base station, the Continuously Operating Reference Stations (CORS) sites used for an On-line Positioning User Service (OPUS) solution (also attach the OPUS report), or the name of the Real Time Network used.

Also provide the vertical datum for the benchmark elevation. All elevations for the certificate, including the elevations for Items C2.a–h, must use the same datum on which the BFE is based. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. Show the datum conversion, if applicable, in the Comments area of Section D.

For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a–h to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Items C2.a–d.** Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7) in Items C2.a–c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a–h. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawlspace, Diagrams 8 and 9, enter the elevation





## Instructions for Completing the Elevation Certificate (continued)

of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents). *If any item does not apply to the building, enter "N/A" for not applicable.*

**Item C2.e.** Enter the lowest platform elevation of at least 1 of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type and its general location, e.g., on floor inside garage or on platform affixed to exterior wall, in the Comments area of Section D or Section G, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

**Items C2.f–g.** Enter the elevation of the ground, sidewalk, or patio slab immediately next to the building. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

**Item C2.h.** Enter the lowest grade elevation at the deck support or stairs. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

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### SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

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Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D to provide datum, elevation, openings, or other relevant information not specified elsewhere on the certificate.

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### SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

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Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1–E4 is based on the "natural grade."

**Items E1.a and b.** Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

**Item E2.** For Building Diagrams 6–9 with permanent flood openings (see pages 8–9), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

**Item E3.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

**Item E4.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter "N/A" for not applicable.*



## Instructions for Completing the Elevation Certificate (continued)

**Item E5.** For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community's floodplain management ordinance.

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### SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

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Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner's representative who provided the information on the certificate.

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### SECTION G – COMMUNITY INFORMATION (OPTIONAL)

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Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1** if Section C is completed with elevation data from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/A1–A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3** if the information in Items G4–G10 has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4–G10 provide a way to document these determinations.

**Item G4.** Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

**Item G5.** Date Permit Issued. Enter the date the permit was issued for the building.

**Item G6.** Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

**Item G7.** New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

**Item G8.** As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

**Item G9.** BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

**Item G10.** Community's design flood elevation. Enter the elevation (including freeboard above the BFE) to which the community requires the lowest floor to be elevated. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.



## Building Diagrams

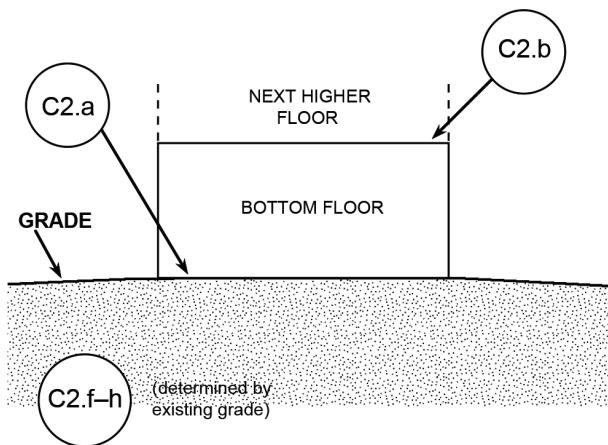
The following diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7, the square footage of crawlspace or enclosure(s) and the area of flood openings in square inches in Items A8.a–c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a–c, and the elevations in Items C2.a–h.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).

**DIAGRAM 1A**

**All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.**

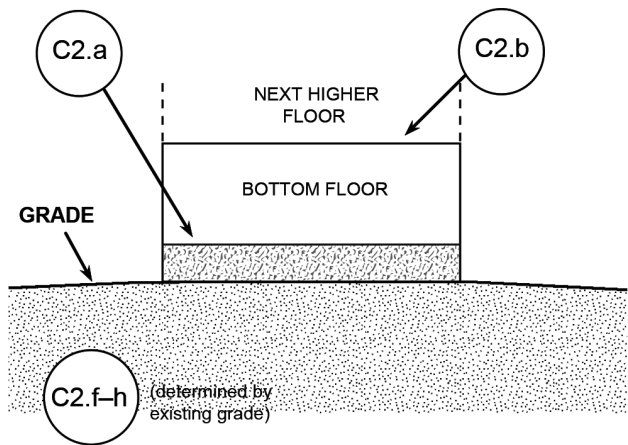
**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.\*



**DIAGRAM 1B**

**All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split-level), either detached or row type (e.g., townhouses); with or without attached garage.**

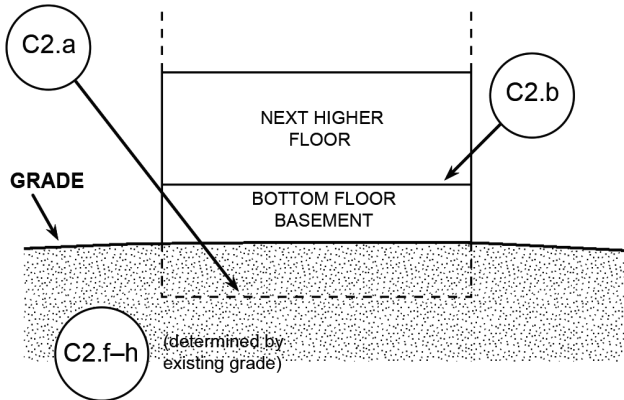
**Distinguishing Feature** – The bottom floor is at or above ground level (grade) on at least 1 side.\*



**DIAGRAM 2A**

**All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.**

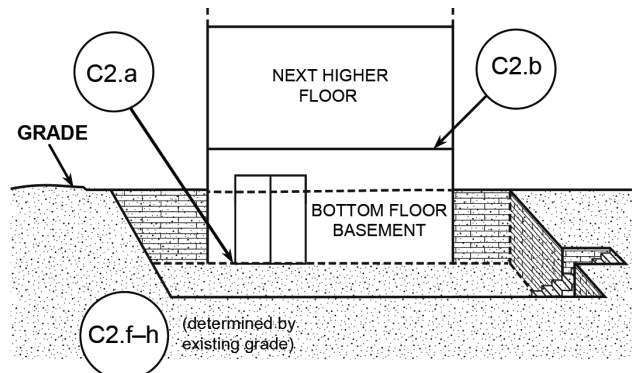
**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.\*



**DIAGRAM 2B**

**All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.**

**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides; most of the height of the walls is below ground level on all sides; and the door and area of egress are also below ground level on all sides.\*



\* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

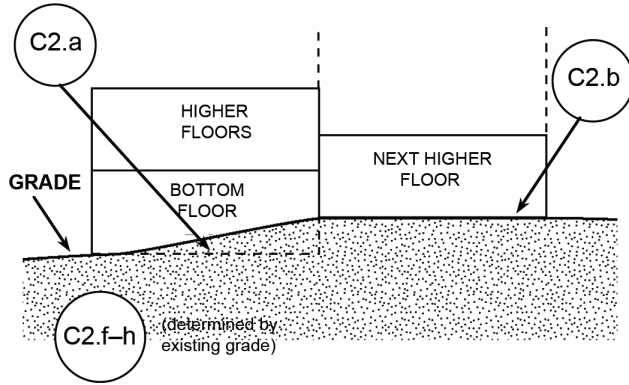


## Building Diagrams

**DIAGRAM 3**

**All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.**

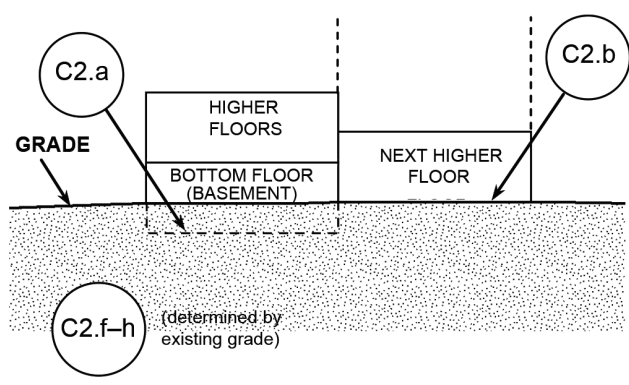
**Distinguishing Feature** – The bottom floor (excluding garage) is at or above ground level (grade) on at least 1 side.\*



**DIAGRAM 4**

**All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.**

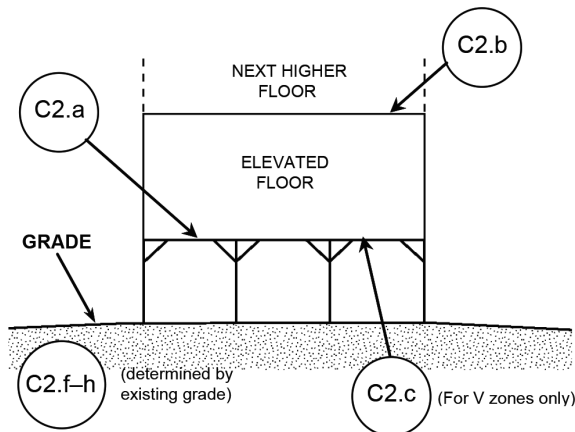
**Distinguishing Feature** – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.\*



**DIAGRAM 5**

**All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.**

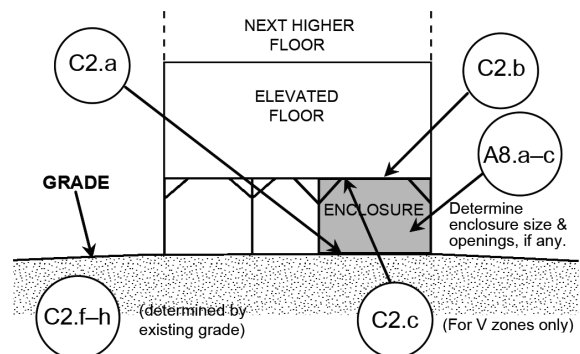
**Distinguishing Feature** – For all zones, the area below the elevated floor is open, with no obstruction to flow of floodwaters (open lattice work and/or insect screening is permissible).



**DIAGRAM 6**

**All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.**

**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



\* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

\*\* An "opening" is a permanent opening that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of 2 openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than 1 square inch for every square foot of area enclosed, excluding any bars, louvers, or other covers of the opening. Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least 2 sides of the enclosed area. If a building has more than 1 enclosed area, each area must have openings to allow floodwater to directly enter. The bottom of the openings must be no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. For more guidance on openings, see NFIP Technical Bulletin 1.

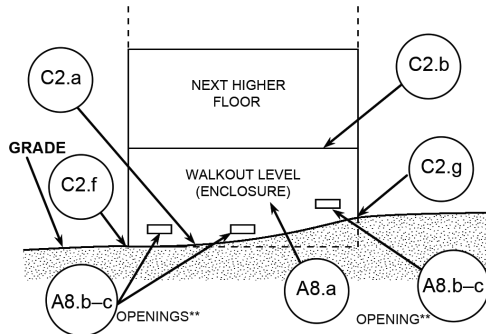


## Building Diagrams

**DIAGRAM 7**

**All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least 1 side is at or above grade. The principal use of this building is located in the elevated floors of the building.**

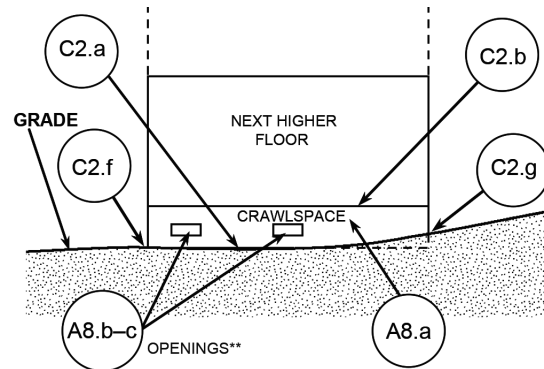
**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



**DIAGRAM 8**

**All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least 1 side, with or without an attached garage.**

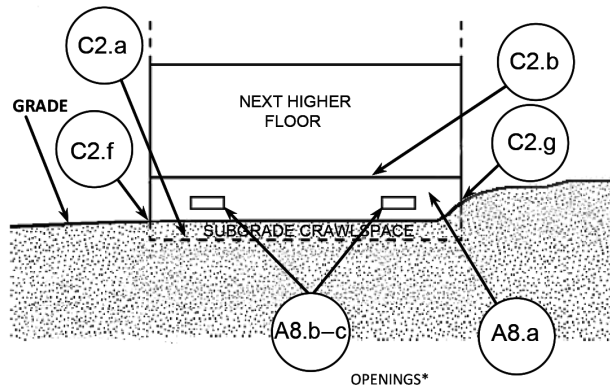
**Distinguishing Feature** – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings\*\* present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.



**DIAGRAM 9**

**All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.**

**Distinguishing Feature** – The bottom (crawlspace) floor is below ground level (grade) on all sides.\* (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, or the crawlspace floor is more than 2 feet below the grade [LAG] on all sides, use Diagram 2A or 2B.)



\* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

\*\* An "opening" is a permanent opening that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of 2 openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than 1 square inch for every square foot of area enclosed, excluding any bars, louvers, or other covers of the opening. Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least 2 sides of the enclosed area. If a building has more than 1 enclosed area, each area must have openings to allow floodwater to directly enter. The bottom of the openings must be no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. For more guidance on openings, see NFIP Technical Bulletin 1.





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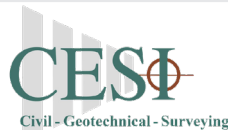
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