NSPS CERTIFIED FLOODPLAIN SURVEYORS (CFS)
NORTHEAST TRAINING AND CERTIFICATION PROGRAM
OCTOBER 31 - NOVEMBER 3, 2023

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NSPS CERTIFIED FLOODPLAIN SURVEYORS (CFS)
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Training Day 1 **October 31, 2023** **8:00 am – 5:00 pm**	**Training Day 2** **November 1, 2023** **8:00 am – 5:00 pm**	**Training Day 3** **November 2, 2023** **8:00 am – 5:00 pm**	**DAY 4** **NOV 3, 2023** **8 am – 12 pm**
NFIP Overview • FEMA and NFIP • Regulations/Terms • Definitions/Acronyms • FIS/FIRMS • Quiz **NFIP Regulations** • Overview – 44 CFR • Part 60: Land Management • Part 65: ID and Mapping of SFHA • Part 70: Map Corrections	**LOMCs** • Using a FIRM and its Components • Letters of Map Change (LOMC) ➢ Description ➢ Policies • LOMC Forms and Data Requirements • LOMC Issuance and CFS support and renewal	**Online LOMC and eLOMA** • Online LOMC requirements • eLOMA requirements **Surveying Technology** • Print on Demand: FIS and FIRM • DFIRM, LIDAR and Geodatabases **Review/Questions and Answers**	EXAM
LUNCH 12:00 – 1:00 pm	**LUNCH 12:00 – 1:00 pm**	**LUNCH 12:00 – 1:00 pm**	
NFIP Regulations – continued **Potential Violations** **NFIP Insurance** • Overview • Risk Rating 2.0 • Quiz	**Resources** • Finding State Specific Regulations and Ordinances • Resources available through FEMA and other sources BFE in Zone A's (Un-numbered A-Zones) for LOMAs	**CFS REVIEW**	
Elevation Certificates • Purposes • Section Breakdown • Building Diagrams • Common Errors • Quiz	**Common LOMC application errors** **Quiz**		

NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 1

NFIP Overview and Definitions

October 31 - November 3, 2023

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This Course Will …

- Explain Certified Floodplain Surveyor (CFS) certification process
- Provide NFIP background information
- Cover commonly used terminology
- Discuss different types of NFIP maps
- Detail differences between map actions vs. letter actions
- Detail differences between various types of letter actions
- Provide background on eLOMA

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Introduction to CFS Training

- The NSPS (CFS) Program started in 2002 and is a joint effort between:
  - Federal Emergency Management Agency (FEMA)
  - National Society of Professional Surveyors (NSPS)
  - State Chapters

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Introduction to CFS Training

- Goals of the CFS Program:
  - Educate surveyors on the forms and processes associated with floodplain properties and the submittal of Elevation Certificates;
  - Provide training to surveyors to enable them to submit completed Letters of Map Change (LOMCs) to FEMA in the proper format required to obtain a determination.

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What is a Certified Floodplain Surveyor (CFS)?

- Any licensed land surveyor who has successfully completed CFS training course and passed final exam.
- Can process "simple" Letters of Map Change (LOMCs) and submit these to FEMA for accelerated processing and issuance.

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Expectations

- You must be present for all training courses (2 ½ days), quizzes, and labs to get credit for the course;
- You must arrive on time to take part in all training courses;
- You must be on time for the exam
  - Multiple Choice, 125 Questions
  - 4 Hours, 2 Parts
  - Must receive 75% on Part I and 80% on Part II.

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CFS Certification Renewal

- Certification renewal will be required every 2 years
- A 4-hour (½-day) training course will be provided for renewal
- This class will count for 4 PDHs
- Attendance is mandatory for CFS certification renewal
- NSPS will maintain list of certified surveyors and will update as surveyors receive CFS certification renewal or lose certification by not attending renewal course

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CFS Instructors

- C. Barton Crattie, LS, CFS, CFM – CEO – The Flood Specialist
- John Gerber, PE, CFS – State NFIP Coordinator for North Carolina (Retired)

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Course Agenda

- Day 1
  - Introduction and NFIP Overview
  - NFIP Regulations
  - NFIP Insurance
  - Elevation Certificates
- Day 2
  - LOMCs and Using Flood Hazard Maps and Data
  - Letter of Map Change Processing
  - Massachusetts's NFIP Program
  - Resources

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Course Agenda

- Day 3
  - FEMA's Online LOMC Portal and eLOMA
  - Surveying Technology
  - Question & Answer/Exam Prep Session
- Day 4
  - Exam (4 hours)

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NFIP Overview

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Congressional Reauthorization for the National Flood Insurance Program

- Congress must periodically renew the NFIP's statutory authority to operate. On Sept. 30, 2023, the president signed legislation passed by Congress that extends the National Flood Insurance Program's (NFIP's) authorization to Nov. 17, 2023.
- Congress must now reauthorize the NFIP by no later than 11:59 p.m. on **Nov. 17, 2023**.

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Congressional Reauthorization for the National Flood Insurance Program

- FEMA would stop selling and renewing policies for millions of properties in communities across the nation.
- National Association of Realtors estimates that a lapse might impact approximately 1,300 property sales each day, roughly 40,000 closings per month.
- Since the NFIP's last multi-year reauthorization expired on Sept. 30, 2017, the program has experienced 25 short-term extensions, including three brief lapses.

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Federal Emergency Management Agency (FEMA)

- Part of the Department of Homeland Security (DHS)
- Functionally organized to mirror life-cycle of emergency management

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Federal Emergency Management Agency (FEMA)

- NFIP is administered by FEMA's Federal Insurance and Mitigation Administration
- Headquartered in Washington, D.C.
- Divided into 10 regional offices
- New England states are located in Region I
- New York is located in Region II

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FEMA Regional Offices

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FEMA's Mission

- To support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

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Purposes of the NFIP

- Identify and map flood hazard areas
- Provide a framework for floodplain management regulations
- Make flood insurance available in communities that participate in the NFIP

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NFIP Background

- Prior to the creation of the NFIP in 1968:
  - Flood insurance coverage was not available
  - No national flood mapping program
  - No Federal minimum standards for floodplain management
  - Escalating costs to taxpayers for flood disaster relief

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NFIP Statistics

- 22,562 participating communities (3/2022), **22,646 (2023)**
- 4.35 million flood insurance policies in force (2022) for a coverage of $1.18 Trillion
- **3.82 million flood insurance policies in force (2023) for a coverage of $1.05 Trillion.**
- Since 1978 (as of September 7, 2022) over $74.04 billion**/(August 15, 2023, $78.46 billion)** in flood insurance claims have been paid (25% of all claims paid for policies outside the mapped floodplain) (from 2014 – 2018 was 40%)
- FEMA has mapped more than 100 million acres of flood hazard areas and designated approximately 5 million acres of floodway

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NFIP Statistics

- NFIP currently carries $20.5 billion in debt to the US Treasury.
- NFIP pays approximately $300 million in interest annually.
- Paid over $5.7 billion in interest since 2005.
- Congress authorized FEMA to borrow up to $30 billion to pay NFIP claims.

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NFIP Goals

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

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Floodplain Management Principles

- Federal government has fundamental interest in floodplain management, but regulating floodplain use lies with State and local authorities
- Floodplain must be considered in context of total community, regional, and national planning and management

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Floodplain Management Principles

- Floodplains can be managed to achieve acceptable levels of natural resource protection values and reduction of flood loss potential

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Floodplain Management Principles

- Sound floodplain management requires:
  - Setting goals and objectives
  - Sharing decision-making across governments
  - Mitigating against flood damages
  - Establishing incentives and disincentives
  - Sustaining a coordination process
  - Evaluating continuously

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Community Participation in the NFIP

- To join the NFIP, communities must submit:
  - Resolution of intent to "maintain in force… adequate land use and control measures" and to cooperate with FEMA
  - Its adopted floodplain management regulations (often are referenced within zoning ordinances, building codes, subdivision ordinances, sanitary ordinances, or floodplain ordinances)

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Role of NFIP Participating Community

- Issuing or denying floodplain development and/or building permits
- Inspecting all development to ensure compliance with local ordinances
- Maintaining records of floodplain development
- Assisting in preparation and revision of floodplain maps
- Helping residents obtain information on flood hazards, floodplain map data, flood insurance, and proper construction measures

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FEMA Definition of Development

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

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Sanctions for Non-Participation

- No Federal grants or loans for development in Special Flood Hazard Areas (SFHAs) under Federal programs
- No Federal disaster assistance to repair insurable buildings located in SFHAs
- No Federal mortgage insurance or loan guarantees in SFHAs
- Federally insured or regulated lenders must notify applicants seeking loans in SFHAs that:
  - There is a flood hazard
  - The property is not eligible for Federal disaster relief

Communities Participating / NP

CT – 177/0
ME – 992/28
MA – 341/9
NH – 220/11
NY – 1504/9
RI – 40/0
VT – 247/20

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Introduction to NFIP Regulations

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NFIP Regulations

- Communities must adopt and enforce ordinances that meet or exceed NFIP criteria
- NFIP criteria ensures that new buildings will be protected from flood levels shown on digital FIRM
- Over time, stock of pre-FIRM buildings should be replaced with post-FIRM buildings and risk to flooding reduced

NFIP Regulations will be covered separately in module 2

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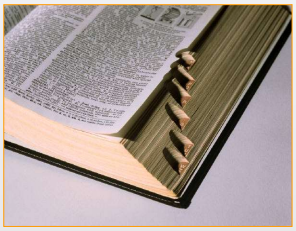
Importance of Regulations

- Describe the Program
- Define the terms used to run the Program
- Provide minimum floodplain management criteria for communities to adopt and enforce
- Provide technical criteria and requirements for revising and amending flood hazard areas on maps
- Codify fees charged for reviewing requests for possible map changes



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Organization of NFIP Regulations

- NFIP Regulations are contained in Parts 59 through 77 of Title 44 of the Code of Federal Regulations (CFR), under Emergency Management and Assistance
- This training will focus on Parts 59, 60, 65, 67, 70, and 72 during Course 3: NFIP Regulations

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44 CFR Part 59: Definitions and Acronyms

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Definitions

- A "flood" is defined by the NFIP as "a temporary condition of partial or complete inundation of normally dry land areas" from:
  - Overflow of inland or tidal waters or
  - Unusual or rapid accumulation or runoff of surface waters from any source

Note: Insurance manual has a different definition

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Base Flood

- A flood that has a 1% annual chance of being equaled or exceeded in any given year
- Formerly referred to as the "100-year" flood

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Definition of SFHA

- Area subject to a 1% or greater chance of flooding in any given year (shown on maps as darkly shaded)
- SFHAs are mapped as flood zones A, AO, A1-30, AE, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, A99, AH, VO, V1-30, VE, V, M, or E

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Flood Zone Designations

A	Areas of 1% annual chance flood determined by approximate methods; base flood elevations not determined
AE	SFHAs inundated by 1% annual chance flood; base flood elevations are shown
AH	Areas of 1% annual chance shallow flooding (usually ponding) where average depths are between 1 and 3 feet; whole-foot base flood elevations are shown
AO	Areas of 1% annual chance shallow flooding where average depths are between 1 and 3 feet (usually sheet flow on sloping terrain); average whole-foot depths are shown

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Flood Zone Designations

AR	SFHAs that result from decertification of previously accredited flood protection system that is in process of being restored to provide 1% annual chance or greater level of flood protection. After restoration is complete, these areas will still experience residual flooding from other flooding sources
A99	SFHAs inundated by 1% annual chance flood to be protected from 1% annual chance flood by a Federal flood protection system under construction; no base flood elevations are determined
V	SFHAs inundated by 1% annual chance flood; coastal floods with velocity hazards (wave action); no base flood elevations are determined
VE	SFHAs inundated by 1% annual chance flood; coastal floods with velocity hazards (wave action); base flood elevations are shown

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Flood Zone Designations

X (unshaded)	Areas determined to be outside the 0.2% annual chance floodplain
X (shaded)	Areas of 0.2% annual chance flood; areas subject to 1% annual chance flood with average depths less than 1 foot or with contributing drainage area less than 1 square mile; and areas protected by levees from base flood
X (future)	Zone X (Future Base Flood) is a flood insurance risk zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.
D	Areas in which flood hazards are undetermined

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Floodway

- Channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that 1% annual chance flood discharge can be conveyed without increasing elevation of 1% annual chance flood by more than specified amount
(1 foot in most States)

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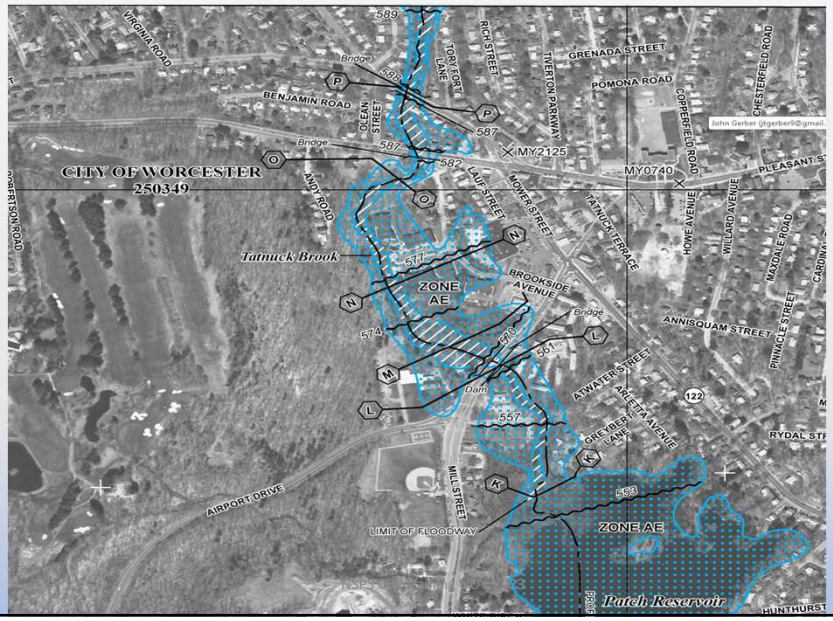
Depiction of a Floodway on the DFIRM



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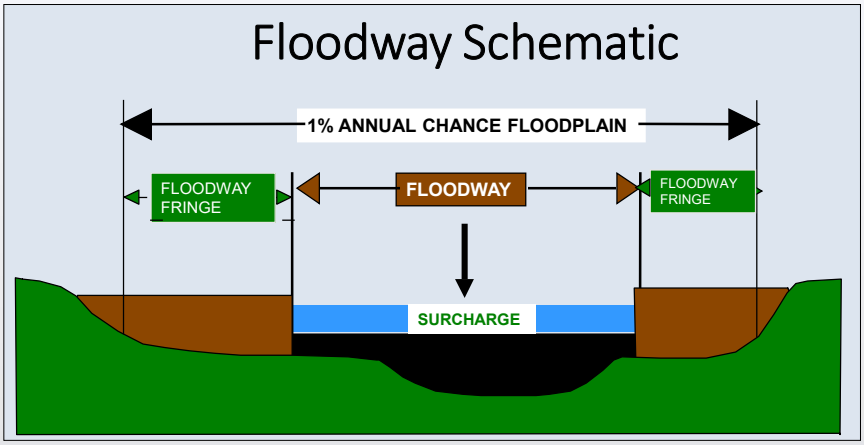
Floodway Schematic



FLOODWAY + FLOODWAY FRINGES = FLOODPLAIN
SURCHARGE NOT TO EXCEED 1.0 FOOT

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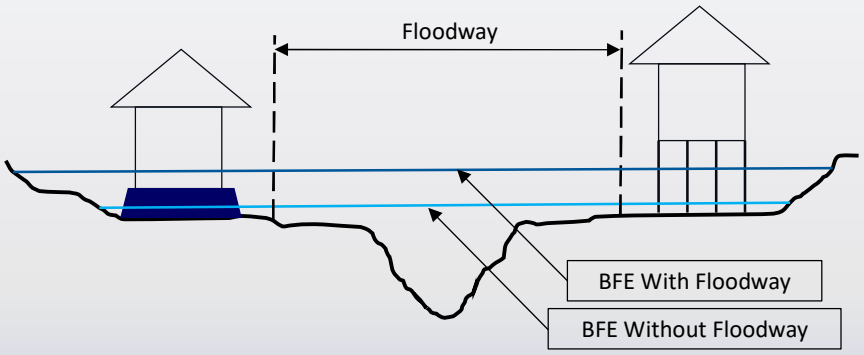
Fringe Development



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Coastal High Hazard Area

- An area of special flood hazard extending 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
  - This coastal wave action hazard is most often associated with hurricanes and Nor'easters
  - Area is mapped on FIRM as Zone V or VE

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Coastal Floodplains

- Wave height
- Wave runup
- Wave setup
- Storm surge

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Definitions and Acronyms

- Coastal Barrier Resource System (CBRS):
  - Units of land consisting of undeveloped coastal barriers and other areas located on the coast of the U.S. that were initially identified under the Coastal Barrier Resources Act of 1982, and later amended by the 1990 Act; flood insurance is not available for structures built after coastal barrier was identified

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Potential Violation

- May occur with any re-channelization of a stream or development in the floodway, without first obtaining a no-rise certification or Conditional Letter of Map Revision (CLOMR)
- May include a project (bridges, culverts, grading, fill placement) within the floodway

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Definitions and Acronyms

- Base Flood Elevation (BFE):
  - Elevation associated with base flood (1% annual chance), shown on digital FIRM, and rounded to nearest whole foot
- Base Map:
  - Depicts cultural features (roads, bridges, dams, etc.), drainage features, and corporate limits

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Definitions and Acronyms

- Community
  - Any State or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or Alaska Native village or authorized native organization, which has authority to adopt and enforce flood plain management regulations for the areas within its jurisdiction.

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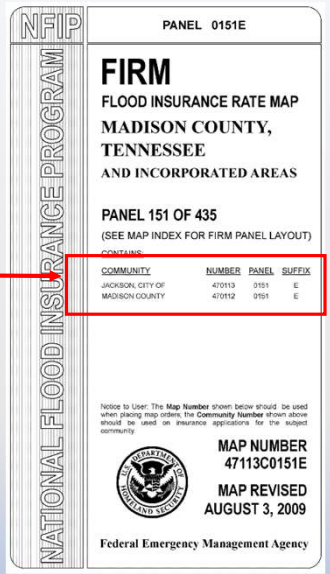
Definitions and Acronyms

- Community Identification Number (CID):
  - Unique 6-digit identification number assigned to each community by FEMA; shown on FIS report and digital FIRM
  - Refer to FEMA's Community Status Book for CID numbers and Map Index dates



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Definitions and Acronyms

- Cross Section:
  - Surveyed line developed from topographic information, spanning across floodplain at which computations of flood flow have been made to establish base flood elevations
  - Shown on digital FIRM and Flood Profiles in Flood Insurance Study (FIS) report

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Definitions and Acronyms

- Development: means **any man-made change** to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials

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Definitions and Acronyms

- Digital Flood Insurance Rate Map (DFIRM):
  - Depicts 1% and 0.2% annual chance floodplains, floodways, BFEs, and zones
  - Includes Flood Hazard Data Table for streams with a floodway
  - Many Zone A areas are updated with Limited Detailed Study
  - Enables lenders to apply the mandatory purchase of flood insurance requirement

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Definitions and Acronyms

- Flood Insurance Rate Map (FIRM):
  - Official map of a community on which the Administrator [of FEMA] has delineated both the special flood hazard areas and the risk premium zones applicable to the community
  - Risk Rating 2.0 no longer bases rates on mapped zones but is used for the mandatory purchase requirement
  - DFIRM: Digital Flood Insurance Rate Map

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Definitions and Acronyms

- Effective Map:
  - Current NFIP map issued by FEMA that is official as of "EFFECTIVE DATE" or "MAP REVISED" date shown on map Title Block
- Encroachment:
  - The advance or infringement of uses, fill, excavation, buildings, structures or development into a special flood hazard area, which may impede or alter the flow capacity of a floodplain.

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Definitions and Acronyms

- Letter of Map Amendment (LOMA):
  - Official determination that a specified structure or property is not within 1% annual chance floodplain
  - Amends effective digital FIRM
  - Removes Federal requirement for mandatory flood insurance (Lenders may still require flood insurance)

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Definitions and Acronyms

- Letter of Map Revision (LOMR):
  - Letter that revises BFEs, flood hazard zones, floodplain boundaries, non-encroachment areas, or floodways as shown on effective digital FIRM
  - A similar action that proposes the above changes is known as a conditional LOMR, or CLOMR.

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Definitions and Acronyms

- Map Repository:
  - Location within community for storage of reference copies of FIS report and digital FIRMs
- National Flood Insurance Program (NFIP):
  - Federal regulatory program under which floodprone areas are identified and flood insurance is made available to property owners of participating communities

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Definitions and Acronyms

- Preliminary:
  - FIS report and digital FIRMs issued to community for review and comment
- V Zone:
  - Coastal high hazard area

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Definitions and Acronyms

- Water-Surface Elevation:
  - Height, in relation to National Geodetic Vertical Datum (NGVD) of 1929 or North American Vertical Datum (NAVD) of 1988, of floods of various magnitudes and frequencies in identified coastal or riverine floodplains areas

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Lowest Adjacent Grade

- Elevation of ground, sidewalk, patio, or deck support immediately next to building
- Lowest ground elevation touching structure or supporting members of structure

For LOMA submittals, must be certified to nearest tenth of a foot

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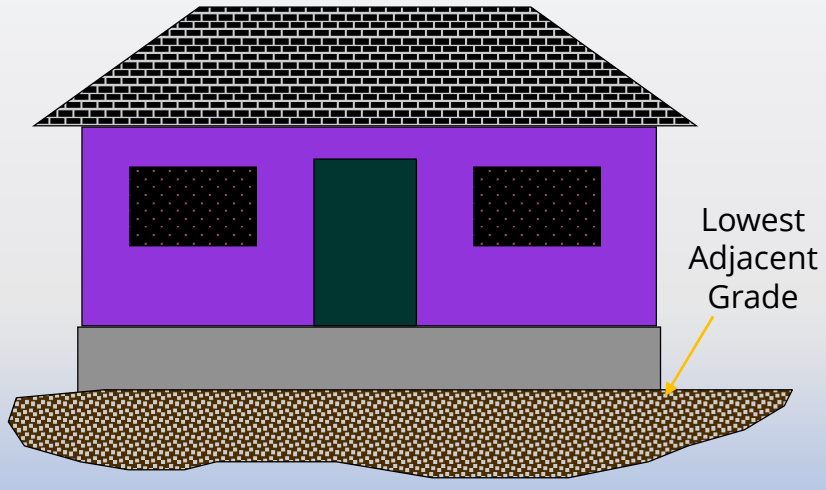
Lowest Adjacent Grade:

Crawl-space foundation without venting



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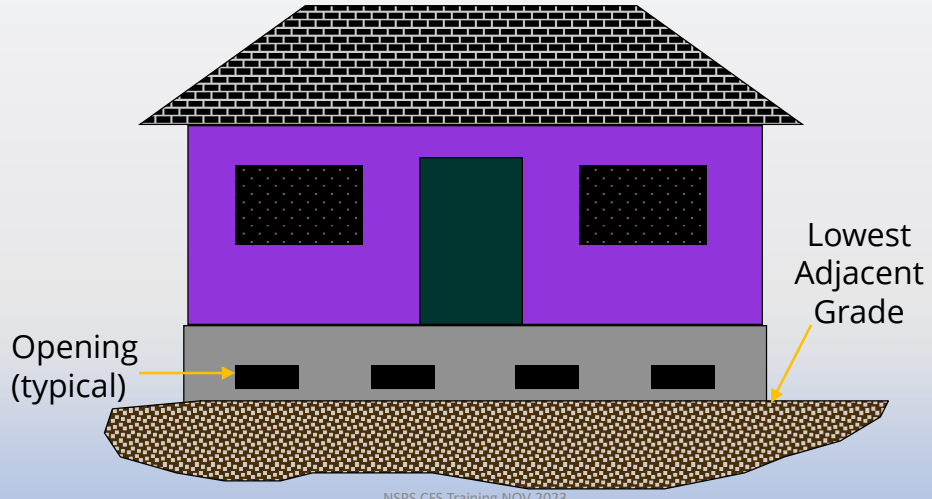
Lowest Adjacent Grade:

Building with Crawl-Space Foundation



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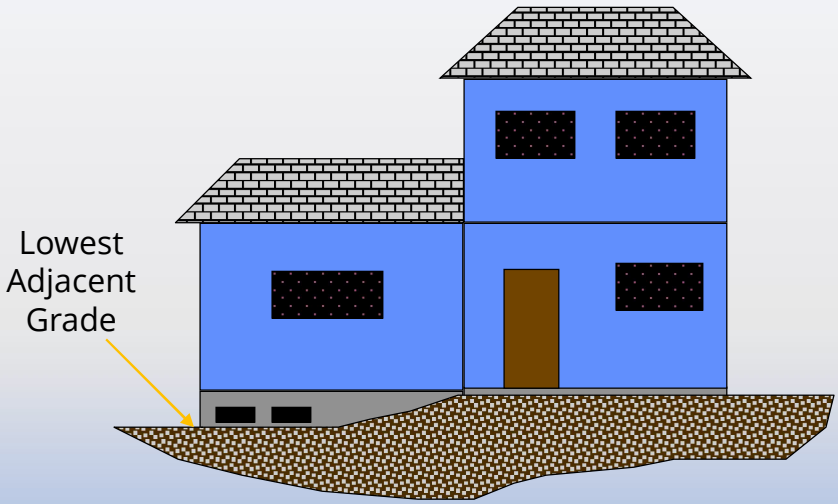
Lowest Adjacent Grade:

Split-Level Building



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Definition of Lowest Floor

- Lowest floor of lowest enclosed area, including basement
- Unfinished or flood-resistant enclosures, used solely for parking of vehicles, building access, or storage in areas other than basements are not considered lowest floors
  - PROVIDED that such enclosures are not built to render structure to be in violation of applicable non-elevation design requirements of a community's ordinance

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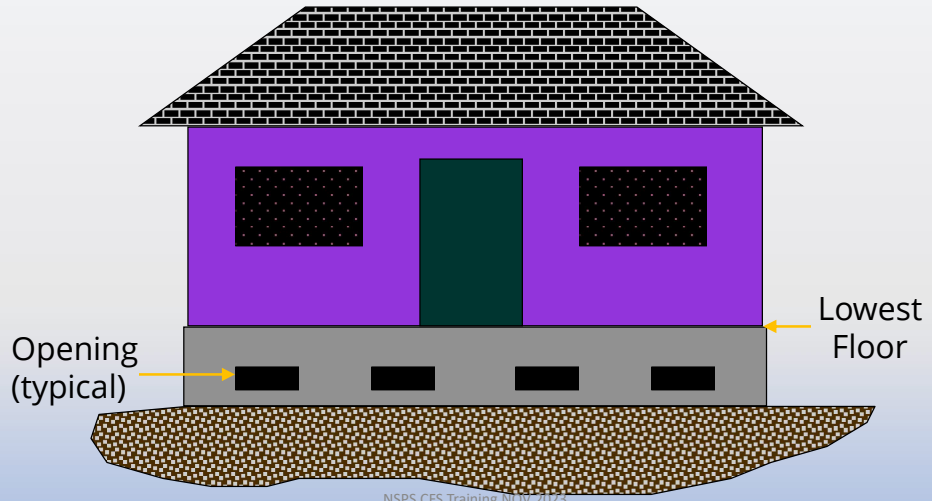
Lowest Floor Elevations:
Crawl-Space Foundation



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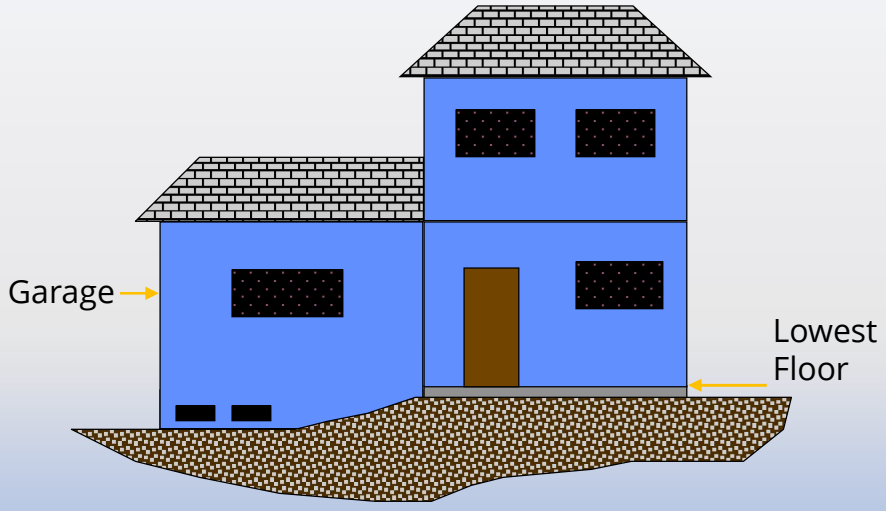
Lowest Floor Elevations:

Split Level Building



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Lowest Floor Elevations:

Basement Foundation

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Flood Insurance Study (FIS) Report and FIRM

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FIS Are Used To

- Identify SFHAs
- Identify location of specific property
- Estimate BFE at specific site (Caution!)
- Identify magnitude of flood hazard in specific area
- ~~Determine flood insurance zone at specific location~~
- Determine location of regulatory floodway or non-encroachment area

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FIS

- Appraises a community's flood problems/risk
- Estimates flood flow frequency
- Establishes flood elevation profiles
- Plots floodplain boundaries
- Provides data to delineate floodways and non-encroachment areas
- Establishes insurance risk zones

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FIS Components

- DFIRM – Digital representation and spatial distribution of flood hazard areas, flood insurance risk zone, BFEs, floodways, and other flood related data
- FIS Report – written text, flood profiles, figures, and tables

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FIS Report

- Background, authority, and scope
- Principal flood problems
- Existing and/or proposed flood control projects
- Engineering methods used
- Floodplain management and/or insurance applications

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Floodway Data Table

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	125	451 / 132[2]	374	1.4	135.1	128.7[3]	129.3	0.6
B	1,950	36	113	4.6	135.1	131.7[3]	132.2	0.5
C	3,180	33	122	4.3	137.2	137.2	137.9	0.7
D	4,200	30	128	4.1	141.1	141.1	141.8	0.7
E	5,190	74	213	2.4	143.5	143.5	143.9	0.4
F	5,295	79	503	1.0	146.8	146.8	146.8	0.0
G	6,040	28	116	4.5	147.0	147.0	147.0	0.0
H	6,170	34	218	2.4	149.4	149.4	149.4	0.0
I	6,450	100	803	0.6	151.6	151.6	151.6	0.0
J	7,420	154	1,166	0.3	151.6	151.6	151.7	0.1
K	8,300	144	315	1.1	151.6	151.6	151.7	0.1
L	8,400	165	556	0.6	152.6	152.6	152.6	0.0
M	8,925	106	1,349	0.3	152.6	152.6	152.6	0.0
N	9,270	142	777	0.5	152.6	152.6	152.6	0.0
O	9,500	157	570	0.6	152.6	152.6	152.7	0.1
P	9,625	245	856	0.4	156.9	156.9	157.0	0.1
Q	10,175	13	37	9.7	158.1	158.1	158.3	0.2

[1]Feet above confluence with Queen River
[2]Total floodway width including floodway of Queen River / width considering Queens Fort Brook only
[3]Elevation computed without consideration of backwater effects from Queen River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, RHODE ISLAND

(ALL JURISDICTIONS)

FLOODWAY DATA

FLOODING SOURCE: QUEENS FORT BROOK

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Floodway Data Table

- Provides data from hydraulic model for each stream studied by detailed H&H methods
- Includes cross section ID, distance from start of model, floodway width, section area, mean velocity, and base flood water-surface elevations
- Included in most FIS reports

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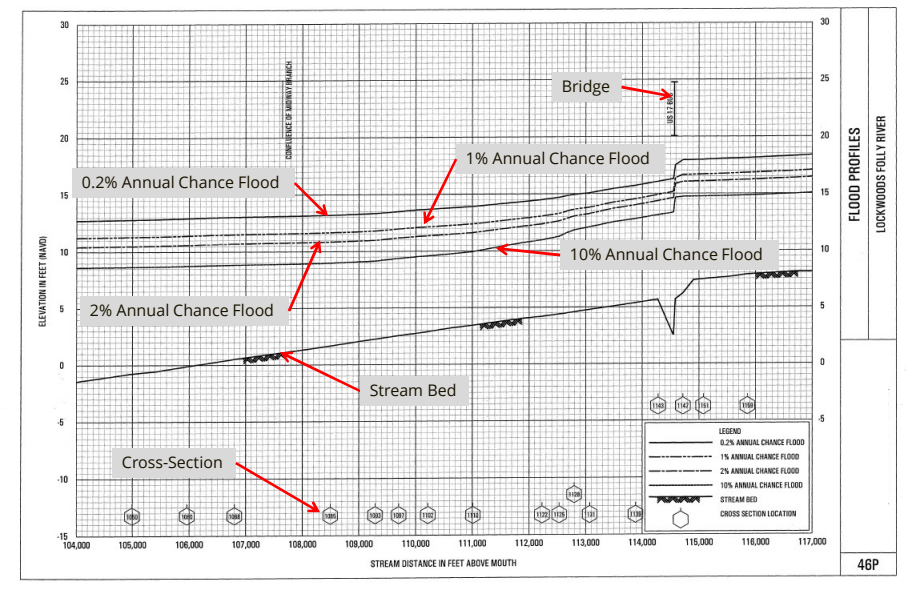
Flood Profile



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Flood Profile

- Depiction of stream invert elevations, cross section locations, and flood elevations along stream
- Depicts hydraulic structures used in the hydraulic modeling analysis
- Shows the extent of the hydraulic modeling analysis
- Used to determine intermediate/exact BFEs between cross sections

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What You Will Find on Flood Maps

- DFIRMs contain variety of information, including:
  - SFHAs
  - Common physical features (highways, railroads, streams, other waterways)
  - Base Flood Elevations (BFEs)
  - Flood insurance risk zones
  - Areas subject to inundation by 0.2% annual chance flood

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What You Will Find on Flood Maps

- DFIRMs may also show:
  - Areas subject to inundation by the Zone X (future) flood
  - Areas designated as regulatory floodways
  - Areas designated as Limited Detailed Study
  - Undeveloped coastal barriers
  - Coastal Barrier Resource Systems

81

Other Types of Maps

- Flood Hazard Boundary Maps (FHBM) - Flat flood map, consisting of one or more 11” x 17” size pages, that includes an index map and legend
- Flood Insurance Rate Map (FIRM) & Flood Boundary and Floodway Map (FBFM) - Z-fold maps, much like a highway map, with more than one panel includes an index

82

Where to Find Flood Maps

Digital Flood Maps can be downloaded from…

- The FEMA Map Service Center
  https://msc.fema.gov/portal/home

- Flood maps are in various formats (i.e. .tif, .pdf, .png)

83

Basic Elements of Flood Maps

- Map Index:
  - Serves as guide to information found on various panels and provides information to map user
- Panel:
  - Each page of the flood map is called a panel; number of panels depends on community size and scale(s) of panels

84

Basic Elements of Flood Maps

- Legend/Key to Map:
  - Found on Z-fold flood maps
  - Provides additional information, including flood insurance risk zone definitions and notes for users
- Title Block:
  - Found on each panel or page
  - Contains community name, panel/page number, and other information necessary to correctly identify panel

85

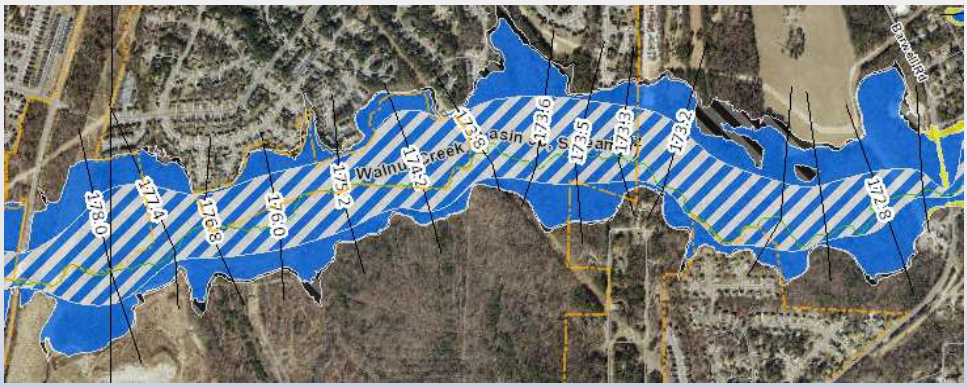
Some Flood Maps Cover Only One Community

- If community is a county, flooding information is only shown for areas under jurisdiction of county government
  - Flooding information for incorporated areas (e.g., towns and cities) will not be found on flood maps
- Separate flood maps are available for incorporated areas

86

Flood Maps Cover Entire Counties

- Flooding information is shown for all geographic areas of county, including towns and cities



87

Information Shown on All Flood Maps

- Community Name:
  - Provides mapped community name, type (e.g., city, county), county, and State
  - When mapped community is a county, it is often referred to as “Unincorporated Areas”; indicates that incorporated areas in county are not included on flood map
  - When mapped community is a county, and the map includes “and Incorporated Areas”, indicates that flood map covers entire geographic area of county

88

Information Shown on All Flood Maps

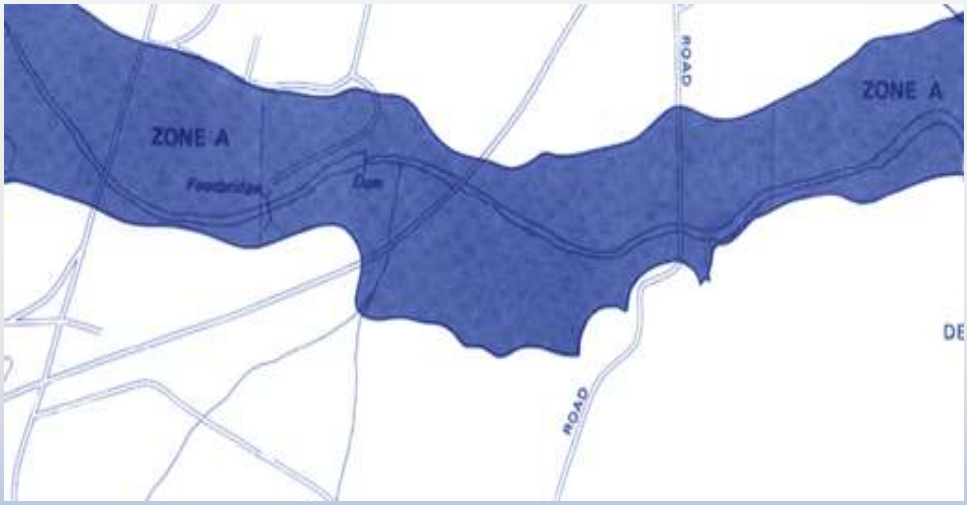
- Community Identification Number (CID):
  - Six-digit identification number assigned to mapped community
  - Use CID number when ordering flood maps from FEMA's Map Service Center
- Corporate Limits and County Boundaries:
  - Identify jurisdictional limits
  - May include extraterritorial jurisdictions (ETJs)

89

Previously Published Types of Flood Maps

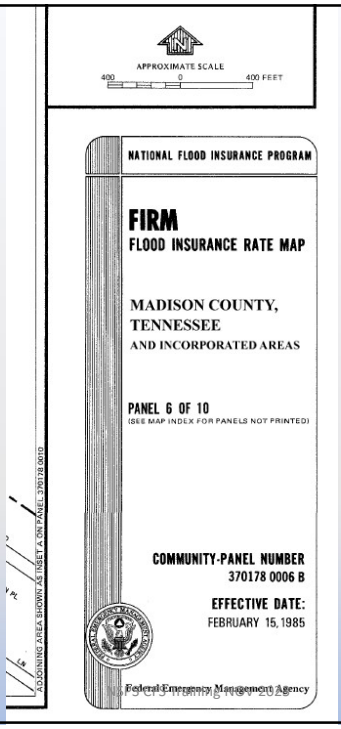
90

Flood Hazard Boundary Map (FHBM)



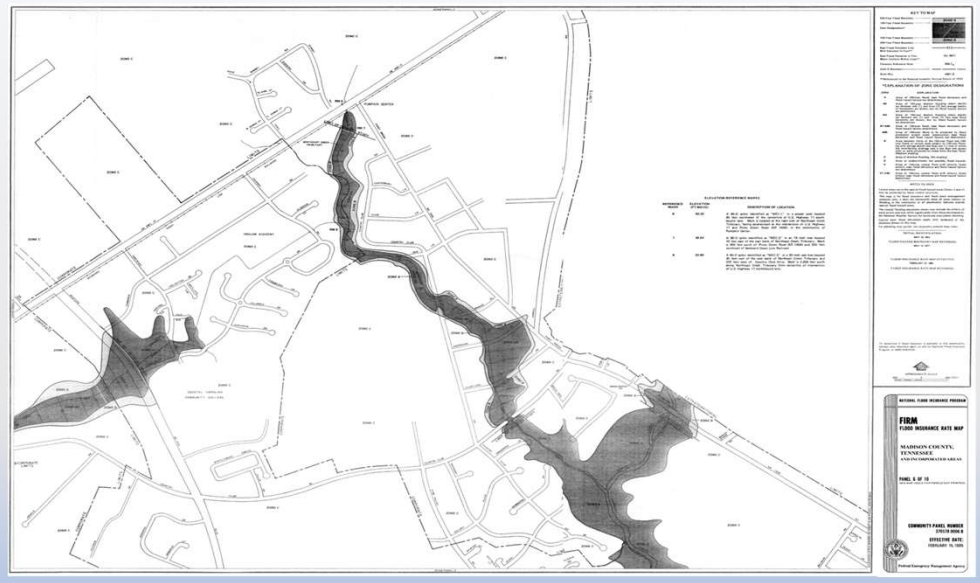
91

Pre-Map Initiatives FIRM

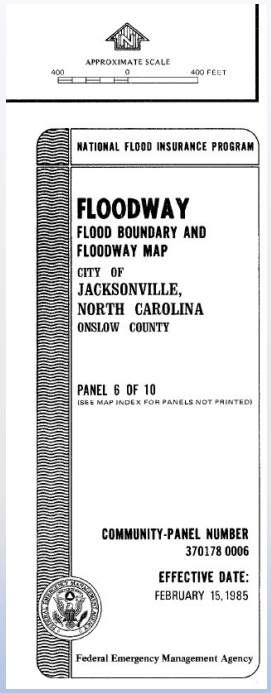


92

Pre-Map Initiatives FIRM



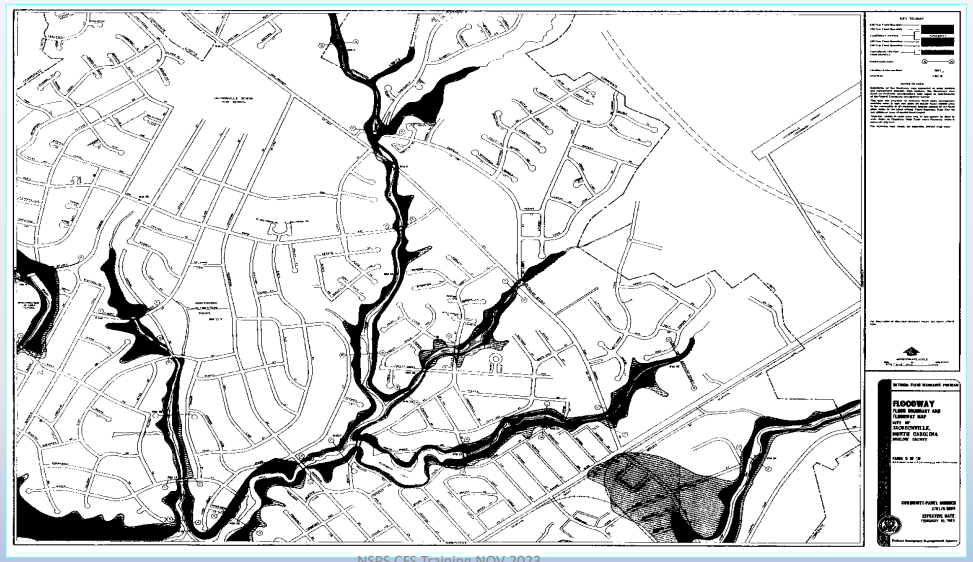
93



Pre-Map Initiatives Flood Boundary and Floodway Map (FBFM)

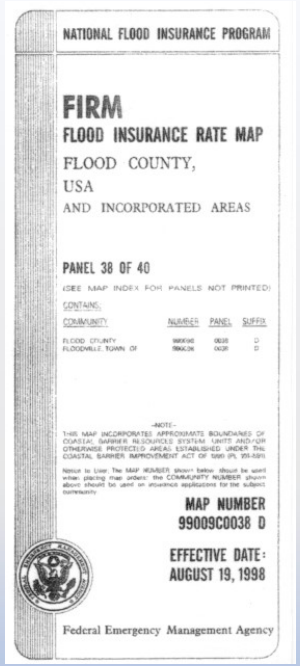
94

Pre-Map Initiatives FBFM



95

Map Initiatives FIRM


NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
FLOOD COUNTY,
USA
AND INCORPORATED AREAS

PANEL 38 OF 40

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FLOOD COUNTY	[illegible]	0038	D
FLOODVILLE, TOWN OF	[illegible]	0038	D

-NOTE-

THIS MAP INCORPORATES APPROXIMATE BOUNDARIES OF COASTAL BARRIER RESOURCES SYSTEM UNITS AND/OR OTHERWISE PROTECTED AREAS ESTABLISHED UNDER THE COASTAL BARRIER IMPROVEMENT ACT OF 1990 (PL 101-591).

Notice 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.

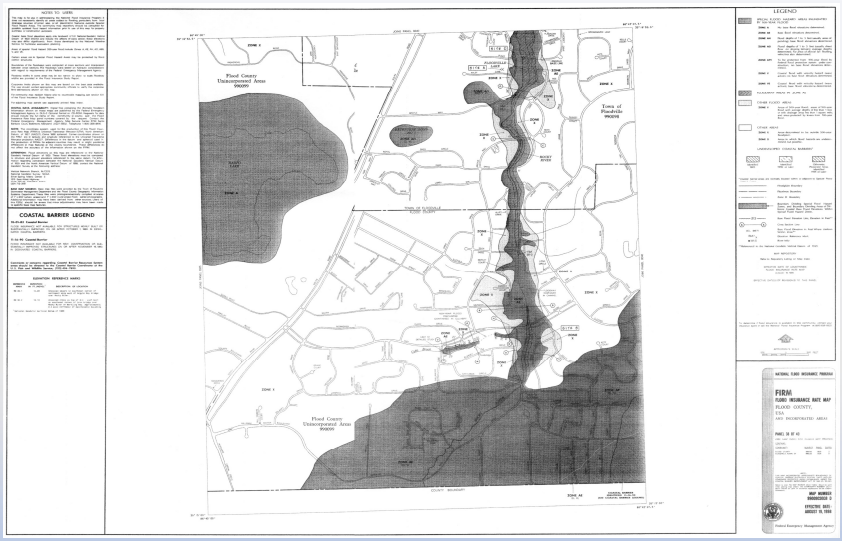
MAP NUMBER
99009C0038 D

EFFECTIVE DATE:
AUGUST 19, 1998

Federal Emergency Management Agency

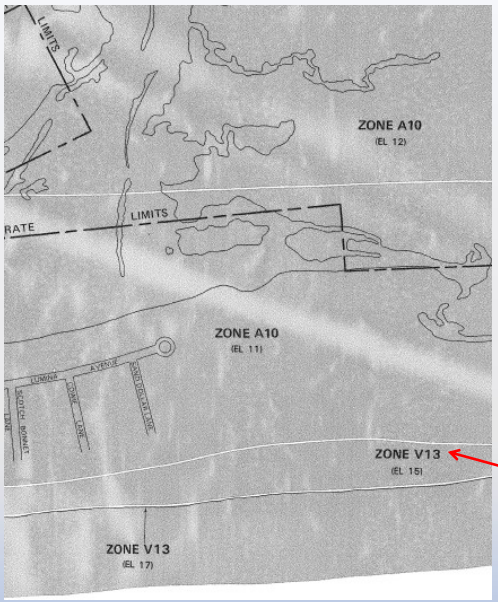
96

Map Initiatives FIRM (dated after 1985)



97

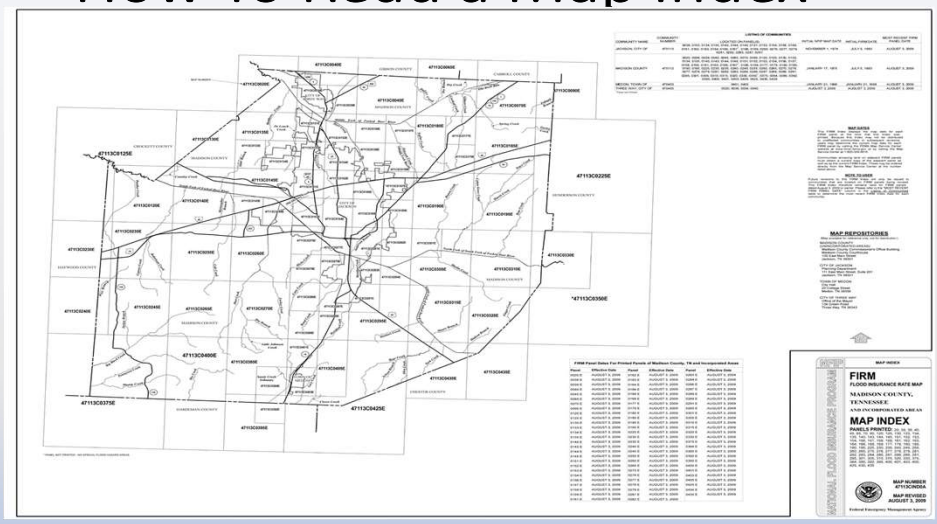
FIRM with Coastal Flooding



Zone V flooding

98

How To Read a Map Index



How To Read a Map Index

- Panel Layout:
  - Identifies digital FIRM paneling scheme of community
- North Arrow:
  - Orients the flood map
- Panel Limit Line:
  - Shows extent of area covered by each panel shown on Index

How To Read a Map Index

LISTING OF COMMUNITIES

COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANEL(S)	INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE
JACKSON, CITY OF	470113	0038, 0133, 0134, 0135, 0143, 0144, 0145, 0151, 0153, 0154, 0158, 0159, 0161, 0162, 0163, 0164, 0166, 0167[1], 0168, 0169, 0260, 0276, 0277, 0279, 0281, 0282, 0283, 0287, 0291	NOVEMBER 1, 1974	JULY 5, 1983	AUGUST 3, 2009
MADISON COUNTY	470112	0020, 0038, 0039, 0040, 0045, 0065, 0070, 0090, 0120, 0125, 0130, 0133, 0134, 0135, 0140, 0143, 0144, 0145, 0151, 0152, 0153, 0154, 0156, 0157, 0158, 0159, 0161, 0163, 0166, 0167[1], 0168, 0169, 0177, 0179, 0180, 0185, 0190, 0195, 0225, 0230, 0235, 0240, 0245, 0255, 0260, 0265, 0270, 0276, 0277, 0278, 0279, 0281, 0282, 0283, 0284, 0286, 0287, 0288, 0289, 0291, 0295, 0301, 0305, 0310, 0315, 0320, 0330, 0350[1], 0375, 0384, 0385, 0392, 0395, 0400, 0401, 0403, 0405, 0425, 0430, 0435	JANUARY 17, 1975	JULY 5, 1983	AUGUST 3, 2009
MEDON, TOWN OF	470403	0401, 0403	JANUARY 21, 1998	JANUARY 21, 1998	AUGUST 3, 2009
THREE WAY, CITY OF	470455	0020, 0038, 0039, 0040	AUGUST 3, 2009	AUGUST 3, 2009	AUGUST 3, 2009

[1] Panel Not Printed

- Panel-Not-Printed Notes:
  - Identifies panels included in layout that are not printed and explains why they are not printed
    - Example — Panels that do not include any flooding information (entire panel is Zone X)

101

How To Read a Map Index

- Effective or Revised Date:
  - Date that Federal and community requirements for floodplain management regulations for SFHAs take effect
- List of Printed Panels:
  - Identifies those panels that are printed out of total number shown on Index
- Map Repositories:

MAP REPOSITORIES

(Map available for reference only, not for distribution.)

MADISON COUNTY
(UNINCORPORATED AREAS):
Madison County Commissioner's Office Building
Madison County Courthouse
100 East Main Street
Jackson, TN 38301

CITY OF JACKSON
Planning Department
111 East Main Street, Suite 201
Jackson, TN 38301

TOWN OF MEDON
City Hall
20 College Street
Medon, TN 38356

CITY OF THREE WAY
Office of the Mayor
136 Green Road
Three Way, TN 38343

102

How To Read a Map Index

- List of Communities, including:
  - All floodprone communities covered by flood map
  - CID numbers for each community
  - Panels on which each community is shown
  - Previous map publication history
  - Special User Notes

NOTE TO USER

Future revisions to this FIRM Index will only be issued to Communities that are located on FIRM panels being revised. This FIRM Index therefore remains valid for FIRM panels dated June 2, 2009 or earlier. Please refer to the "MOST RECENT FIRM PANEL DATE" column in the LISTING OF COMMUNITIES table to determine the most recent FIRM Index date for each community.

103

How To Read Flood Map Panels

104

Same Information as Index

- All map panels, regardless of format, include six items that also appear on Index. These are:
  - Community Name
  - CID Number
  - Panel Number
  - Corporate Limit or County Boundary
  - North Arrow
  - Effective or Revised Date

105

Found on All Panels

- Base Flood Elevation (BFE) Line and Label:
  - Indicate water-surface elevation of base flood in relation to standard set of data in SFHAs
  - Wavy line intended to represent approximate BFE when flood elevations vary along watercourse – Do not use as regulatory BFE!
  - Label is used when BFE is uniform across large area (coastal or lacustrine areas)
  - Shown in feet

106

Found on All Panels

- Flood Hazard Area Designations:
  - Appear as dark, light, or color tints
  - Dark shading indicates areas of greater flood hazard; light tints indicate areas of lesser flood hazard
- Floodplain Boundaries:
  - Show limits of 1% and 0.2% annual chance floodplains

107

Found on All Panels

- Map Scale:
  - Allows you to relate distances measured on flood map to actual distances on ground
  - Scale shown on panel applies only to that panel
- Notes to User:
  - Provide additional information to clarify data

108

Found on All Panels

- Zone Division Line:
- Separates SFHAs with different zone designations or similar zone designations but different BFEs
- Zone Labels

109

Found on Many Panels

- Cross Section Symbol:
  - Shows locations of floodplain cross section used for computing BFEs
- Floodway Boundaries:
  - Show limits of regulatory floodways
- Floodway Designation:
  - Identifies floodway areas

110

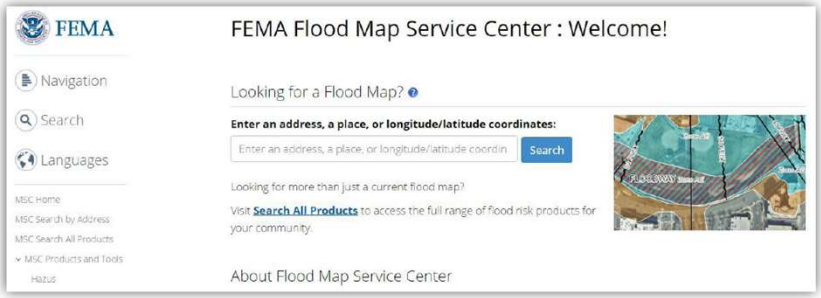
FEMA Maps Online

- All FEMA-issued FIRMs, DFIRMs, and FIS reports are available to view online or for purchase through FEMA's Flood Map Service Center at http://msc.fema.gov/portal
- Full-scale section of FIRM panel can be printed out using the "FIRMette" tool as described below:
  - From FEMA.gov -Click on "Site Map" at the top of the screen; then click on "M" of the 'Alphabetical Index of FEMA Web Site' or scroll down the page to 'Map Service Center (FEMA)'; click on "Map Service Center"; then click on the link for "Flood Maps"

111

Getting Started

First, navigate to the FEMAFlood Map Service Center (MSC), http://msc.fema.gov.



- A Flood Insurance Rate Map (FIRM) is an official flood map used in the National Flood Insurance Program.
- Most FIRMs are divided into FIRM panels. The panels are large (2ft x 3ft) and difficult to print.
- You can create a FIRMette which is an easy to print full-scale section of a FIRM

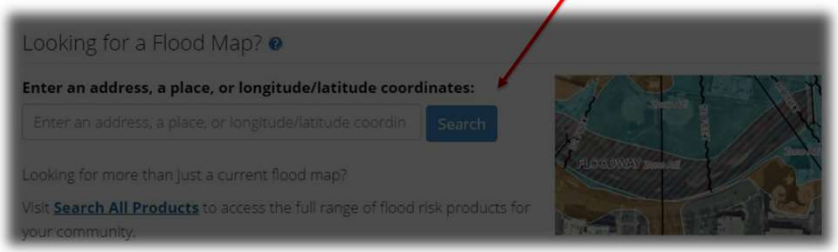
112

Step One

Search by Address

To find a flood map for a specific address or landmark, you may type an address in the search bar or use the Address Search option on the left side of the MSC homepage.

Enter an address or a place of interest and select the "Search" button.

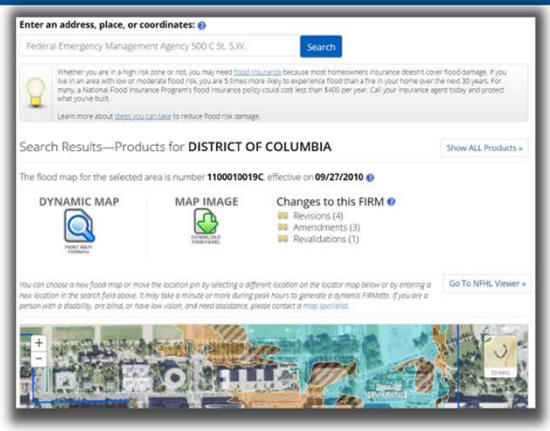


113

Step Two

Option A - Print a FIRMette

Most search results include 2 options and a map that displays your location and the flood zones for the area*
The first option creates a printable FIRMette from FEMA's dynamic digital flood data.

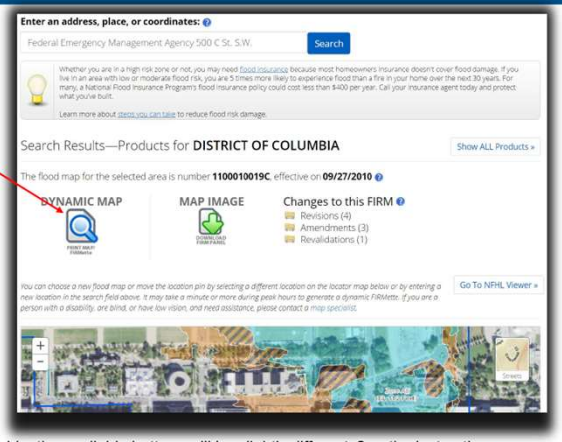


NOTE: If digital data is not available, flood zones will not display, only the FIRM boundaries.

114

Step Two
Option A - Print a FIRMette

Select "Print Map/FIRMette" This will create a FIRMette in pdf format. This printable map is created dynamically using the current effective FIRM, plus any letters of map revision issued since.



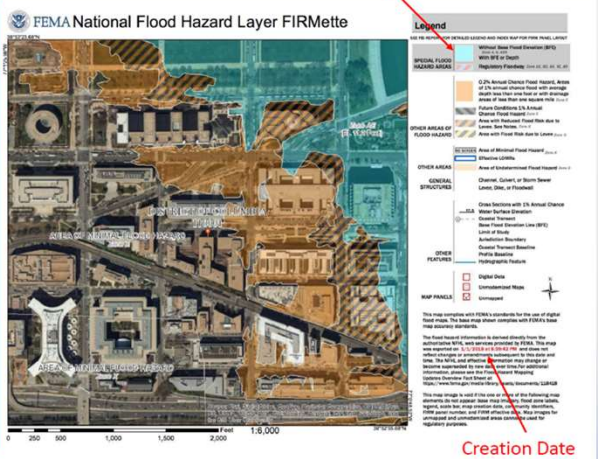
NOTE: If digital data is not available, the available buttons will be slightly different. See the instructions for using FIRMette Web later in this document.

115

Step Two
Option A - Print a FIRMette

Legend

And you're done! After a few moments, the FIRMette will open in a new browser tab and be centered on the approximate location from Address Search. Here's an example FIRMette. Once opened, you can save the documents or use the "Print to PDF" option to print the documents

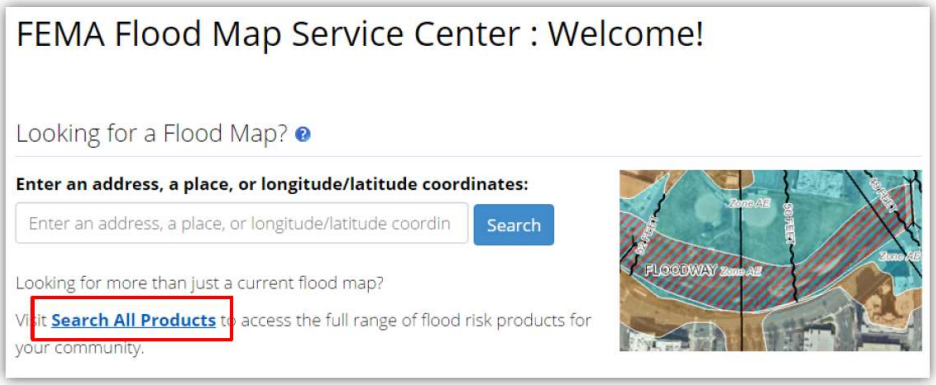


116

Step One

Option B: Search All Products

Advanced users may find Effective and Historic FIRMs available for a community, as well as a listing of all other available flood hazard products, using the "Search All Products" feature from the homepage.

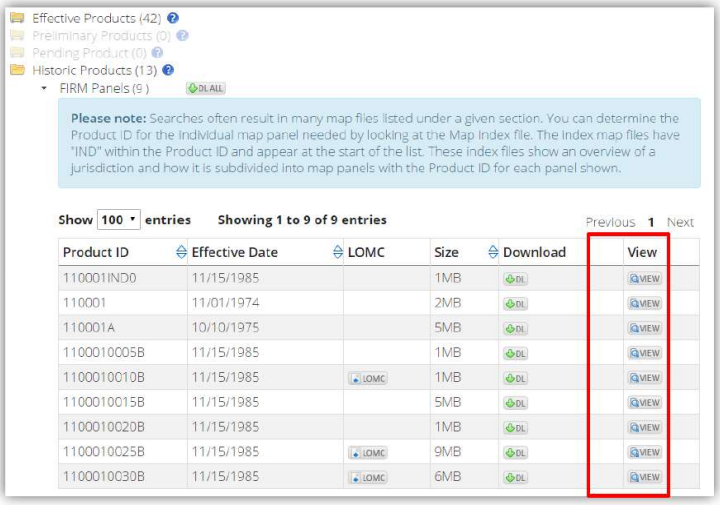


117

Step One

Option B: Search All Products

Once you've entered your community and selected "All Products", it will take you to a listing of all available products (including Historic FIRMs), for your selected jurisdiction that you can then choose to view in the *FIRMette Web* tool.



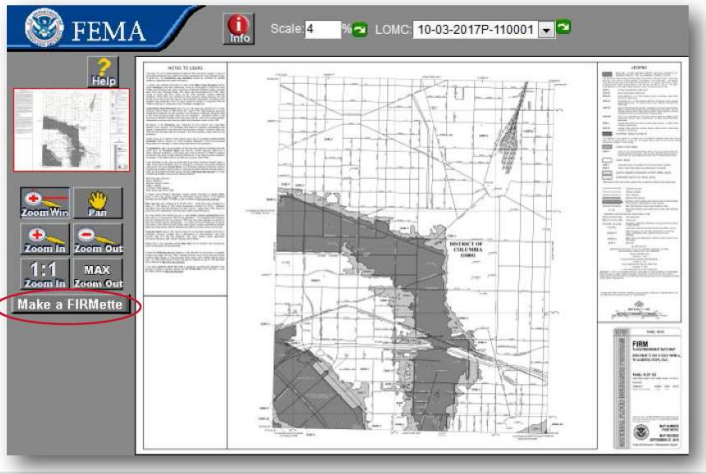
118

Step Two

Making FIRMettes in *FIRMette Web*

A new window will appear, containing the *FIRMette Web* tool, which will display the selected FIRM panel.

Select the "Make a FIRMette" button.



119

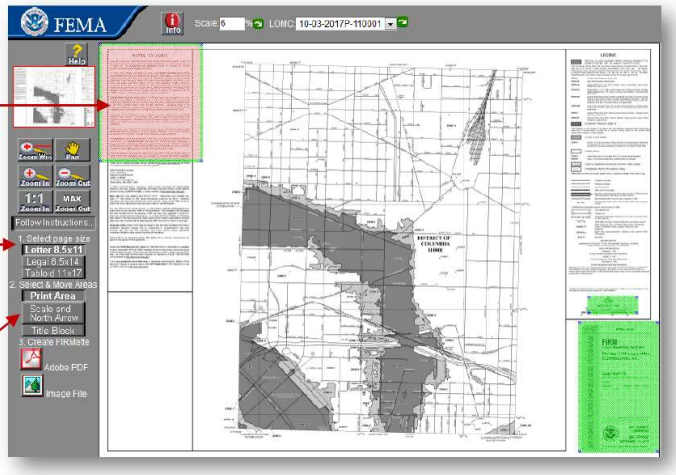
Step Two

Making FIRMettes in *FIRMette Web*

Click, hold, and drag the pink layer to cover the area you want in your FIRMette.

Choose your paper size.

To reposition the title block or scale and north arrow, click the appropriate button and drag the new pink layer.



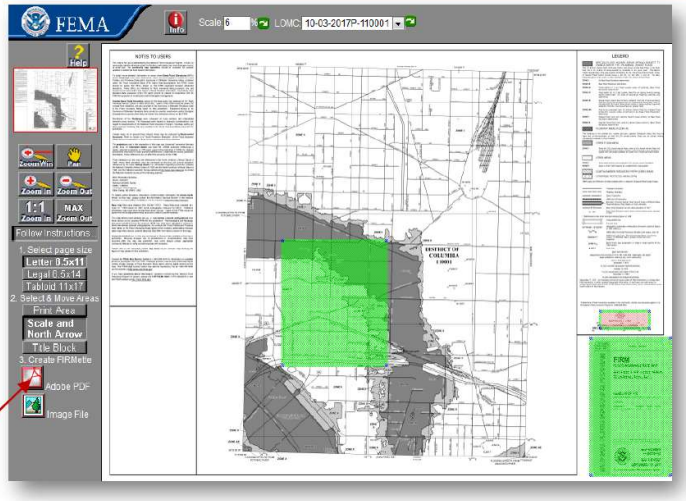
120

Step Two

Making FIRMettes in *FIRMette Web*

- You may use the Zoom and Pan functions to more precisely identify the area you want in your FIRMette.
- However, you must be zoomed out all the way in order to make a FIRMette correctly.

When ready, click on your preferred output format, "Adobe PDF" or "Image File"

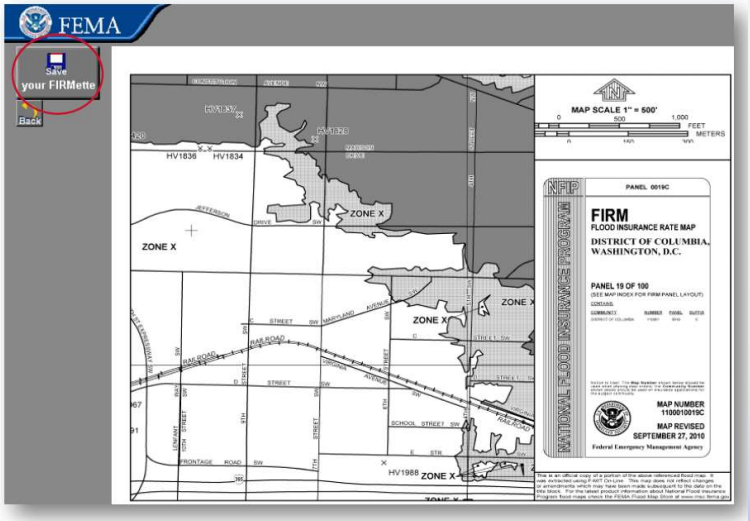


121

Step Two

Making FIRMettes in *FIRMette Web*

- Your FIRMette will appear and can be saved to your hard drive.
- You can also go back and make additional FIRMettes from the same panel.

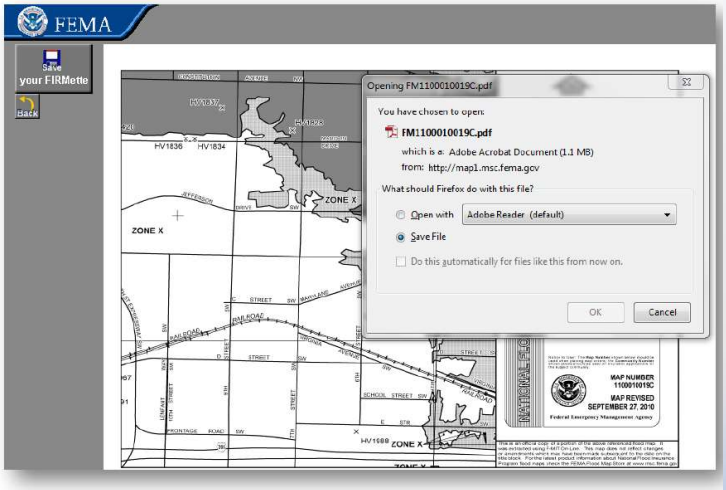


122

Step Two

Making FIRMettes in *FIRMette Web*

Once you have saved and/or opened your FIRMette in your local viewer, you can print it out the on the appropriate-sized paper corresponding to your earlier selection. To preserve the scale from the original FIRM map, save as PDF and change print settings to "actual size"



123

Map Update Methods

124

Map Update Methods

- FEMA-Funded Updates:
  - Study/Restudy
  - Limited Map Maintenance Program (LMMP) Revision
  - Existing Data Study (XDS)

125

Map Update Methods

- Community/Property Owner-Initiated Amendments and Revisions:
  - Letters of Map Change (LOMCs)
    - Letter of Map Amendment (LOMA)
    - Letter of Map Revision – based on Fill (LOMR-F)
    - Letter of Map Revision (LOMR)
  - Physical Map Revisions (PMRs)

126

Conclusion

You should:

- Have an understanding of CFS certification program
- Understand NFIP background information
- Be comfortable with commonly used terminology
- Understand different types of NFIP maps
- Understand differences between map actions and letter actions
- Understand differences between different types of letter actions

127

128

Quiz

129

Certified Floodplain Surveyor (CFS) Quiz

NFIP Overview/Using FIS report and FIRM

1. Does a Zone A designated flooding source have an established base [1-percent-annual chance (100-year)] flood elevation?

2. What does the acronym "FEMA" stand for? In which FEMA Region is your state located? List state and region.

3. What must a community submit to join the National Flood Insurance Program?

4. What is the definition of Special Flood Hazard Area (SFHA)? What FIRM zones are SFHAs?

5. True/False: The floodway is typically wider than the floodplain for a stream.

6. True/False: Flood Boundary and Floodway Maps do not depict cross sections.

7. What zone designations characterize a coastal high hazard area?

8. Can you determine a more accurate Base Flood Elevation between cross sections from a Flood Profile than from a FIRM panel? If 'No', why?

NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 2

NFIP Regulations

October 31 - November 3, 2023

1

This Module Will …

- Provide an overview of key legislation related to the NFIP
- Explain NFIP regulations
- Detail regulations that apply to LOMA and LOMR-F processing
- Discuss potential violations

2

Key Legislation

3

National Flood Insurance Act of 1968

- Established NFIP
- Required mapping of floodprone areas (SFHAs)
- Made flood insurance available in communities that meet floodplain management criteria

4

Flood Disaster Protection Act of 1973

- Represented significant expansion of provisions and national impact of NFIP
- Required acceleration of Flood Insurance Studies
- Required notification to communities of floodprone identification
- Created mandatory flood insurance purchase requirement relative to Federally-backed loans
- Required participation in NFIP as condition for most types of Federal financial assistance

5

Executive Order 11988 (1977)

- Federal construction to follow standards and intent of the NFIP
- Floodplain management to be accounted for in evaluation water and land use plans
- Restore and preserve the natural and beneficial values served by floodplains in carrying out agency responsibilities

6

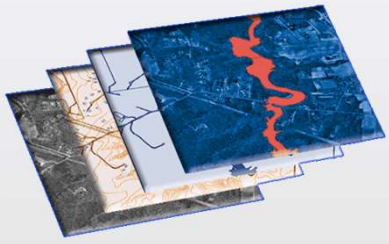
Coastal Barrier Resources Act of 1982

- Prohibited federal funding for building and development in undeveloped areas of designated areas.
- Mapped Coastal Barrier Resources System (CBRS) units
- Prohibited sale of NFIP flood insurance in CBRS units for structures built or substantially improved on or after 10/1/1983 or subsequent CBRS identification dates as shown on FIRMs (per Coastal Barrier Improvement Act of 1990)

7

National Flood Insurance Reform Act of 1994

- Strengthened flood insurance requirements, particularly regarding secondary mortgage market
- Required that community's NFIP maps be reviewed and assessed for map update needs every 5 years
- Established Technical Mapping Advisory Council (from 1995 – 2000)



8

National Flood Insurance Reform Act of 1994

- Created penalties for lender non-compliance
- Created Increased Cost of Compliance coverage (to bring damaged structures up to compliance standards)
- Increased flood insurance coverage limits
- Created Flood Mitigation Assistance (FMA) Program
- Required a mandatory 30-day waiting period before a new NFIP policy becomes effective

9

Biggert-Waters 2012

- Eliminate Subsidies
- Removed Grandfathering
- Move to actuarial rates at 25% per year for non-primary residences
- Actuarial upon sale
- Required establishment of a National Flood Insurance Reserve Fund to be available to pay claims, repay debt owed to the U.S. Treasury, and meet the future obligations of the NFIP

10

Homeowners Flood Insurance Affordability Act of 2014

- Repealed and limited many premium increases required by BW-12
- Imposed a surcharge based on occupancy and primary residence status
- With limited exceptions, reduced the cap on annual increases for flood insurance premiums to 18 percent
- Authorized FEMA to secure reinsurance for the NFIP from the traditional reinsurance and capital markets

11

Homeowners Flood Insurance Affordability Act of 2014

- Rate-increase limitations
  - Limit increases for individual premiums to 18% of premiums
  - Limit increases for average rate classes to 15%
- New annual surcharge (goes into reserve fund)
  - $25 primary residential
  - $250 for all other policies

The surcharge is NOT included in the rate calculation, so the total amount charged to the policyholder may increase more than 18%

12

Homeowners Flood Insurance Affordability Act of 2014

- No longer actuarial upon sale
- Reinstated Grandfathering
- Non-Primary & Commercial increases up to 25%
- Deductibles
  - Maximum residential deductible limits are increased from $5,000 to $10,000

13

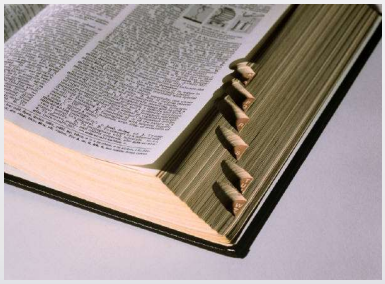
Executive Order 13690 (2015)

- Established a Federal Flood Risk Management Standard
- "…ensure that agencies expand management from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended."

14

NFIP Regulations: Purpose

- Describe the Program and provide framework for NFIP
- For CFS, regulations codify technical criteria and requirements for revising and amending flood hazard areas on flood maps



15

How Legislation Becomes a Regulation

- Legislation is signed into law
- FEMA (or other Federal agency) proposes a rule in *Federal Register*
- Public Comment Period (usually 60 or 90 days)

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How Legislation Becomes a Regulation

- FEMA reviews and consolidates comments
- FEMA proposes Final Rule incorporating any necessary changes – includes supplementary information that responds to comments

Statutory versus Regulatory

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NFIP Regulations

- Communities must adopt and enforce ordinances that meet or exceed NFIP criteria
- NFIP criteria are designed to ensure that new buildings will be protected to the flood levels shown in the Flood Insurance Study
- Over time, stock of pre-FIRM buildings should be replaced with post-FIRM buildings and exposure to flooding reduced

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Importance of Regulations

- Describe Program
- Define terms used to run Program
- Provide minimum floodplain management criteria for communities to adopt and enforce
- Provide technical criteria and requirements for revising and amending flood hazard areas on flood maps
- Codify fees charged for reviewing map change requests

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Citing NFIP Regulations

- For example – 44 CFR 65.5 or Title 44, Part 65, Section 5
- You may also see citations as:
  - Part 65 of the NFIP regulations
  - Section 65.5
  - Paragraph 65.5(a)
  - Subparagraph 65.5(a)(6)
  - Subparagraph 65.5(a)(6)(i)

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Organization of NFIP Regulations

- NFIP regulations are contained in Parts 59 through 77 of Title 44 of the Code of Federal Regulations (CFR), under Emergency Management and Assistance

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Organization of NFIP Regulations

- Part 59 — General Provisions:
  - Definitions and Program description
- Part 60 — Criteria for Land Management and Use:
  - Floodplain management ordinances
- Part 65 — Identification and Mapping of Special Hazard Areas:
  - Map revisions, floodways, and levees
- Part 67 — Appeals from Proposed Flood Elevation Determinations:
  - Types of appeals and appeal procedures

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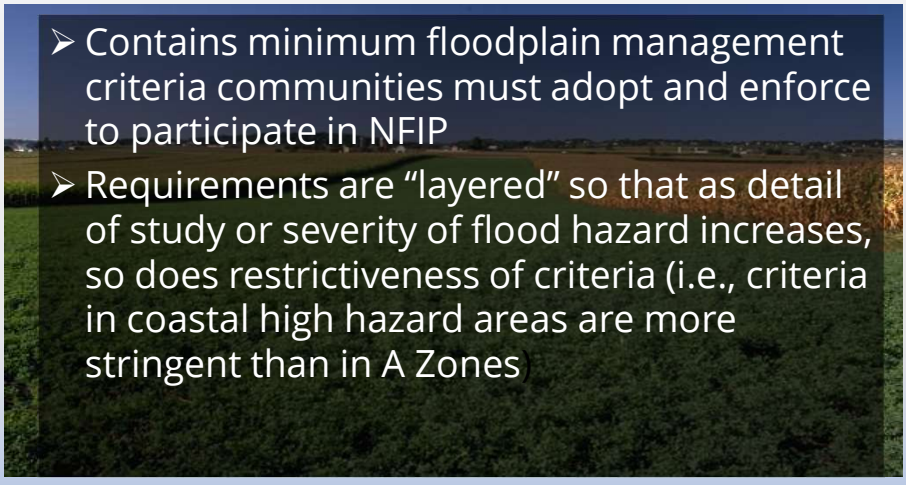
Organization of NFIP Regulations

- Part 70 — Procedure for Map Correction:
  - Administrative procedure for review of scientific or technical submissions by property owner who believes their property has been inadvertently included in Special Flood Hazard Area (SFHA)
  - LOMAs and conditional LOMAs
- Part 72 — Procedures and Fees for Processing Map Changes:
  - Fee schedule and payment procedures

23

Section 60.3 – Floodplain Management Criteria for Floodprone Areas



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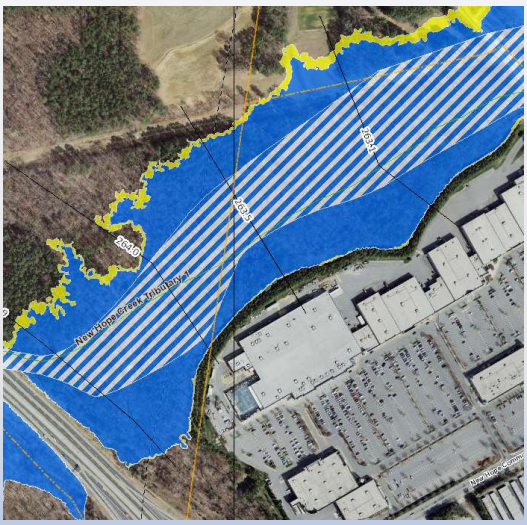
Part 65 – Identification and Mapping of Special Hazard Areas

- Purpose – To outline steps community needs to take in order to assist FEMA's effort in providing up-to-date identification and publication of flood hazard maps



25

44 CFR Part 65

- Section 65.3 – Requirement to submit technical data
- Section 65.4 – Right to submit new technical data
- Section 65.5 – Revisions to SFHA boundaries with NO change to BFE determinations (more details will follow)
- Section 65.6 – Revisions of BFE determinations

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44 CFR Part 65

- Section 65.7 – Floodway revisions
- Section 65.8 – Review of proposed projects
- Section 65.10 – Mapping areas protected by levee systems
- Section 65.12 – Revisions of FIRMs to reflect BFE changes caused by proposed encroachments

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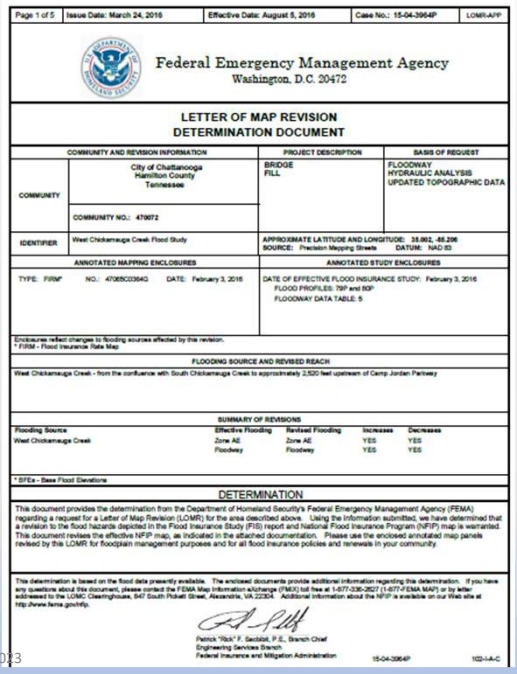
44 CFR Section 65.5 – LOMR-Fs

- Section 65.5 – LOMR-Fs:
  - In SFHAs (**except V Zones and floodways**), it may be feasible to elevate areas (structures or parcels of land) with fill above BFE
  - For definition of 'fill', see Section 70.1
  - Any alteration of topography (since effective date of community's first NFIP map) showing property within SFHA is subject to Part 65 provisions



Page 1 of 5 | Issue Date: March 24, 2016 | Effective Date: August 5, 2016 | Case No.: 15-04-3964P | LOMR-APP

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Chattanooga Hamilton County Tennessee	BRIDGE FILL	FLOODWAY HYDRAULIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 470072		
IDENTIFIER	West Chickamauga Creek Flood Study	APPROXIMATE LATITUDE AND LONGITUDE: 35.002, -85.206 SOURCE: Precision Mapping Streets DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM NO.: 47065C0364G DATE: February 3, 2016	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: February 3, 2016 FLOOD PROFILES: 70P and 80P FLOODWAY DATA TABLE: 5

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REVISED REACH

West Chickamauga Creek - from the confluence with South Chickamauga Creek to approximately 2,520 feet upstream of Camp Jordan Parkway

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
West Chickamauga Creek	Zone AE	Zone AE	YES	YES
	Floodway	Floodway	YES	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

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 Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304. Additional information about the NFIP is available on our Web site at http://www.fema.gov/nfip.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

15-04-3964P 102-I-A-C

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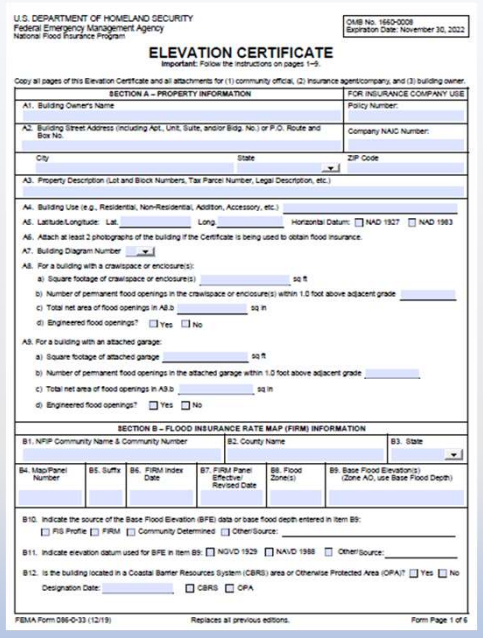
44 CFR Section 65.5 – LOMR-Fs

- LOMR-Fs – Requestor must submit:
  - Copies of recorded deeds and/or plat maps
  - Certified topographic map indicating present ground elevations and fill
  - Location of structure and Lowest Adjacent Grade (LAG) elevation
  - Applicable review fee
  - Copy of effective FIRM showing location of the property MT-1Forms



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

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

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: ☐ 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

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

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

FEMA Form 086-0-33 (12/19) — Replaces all previous editions. — Form Page 1 of 6

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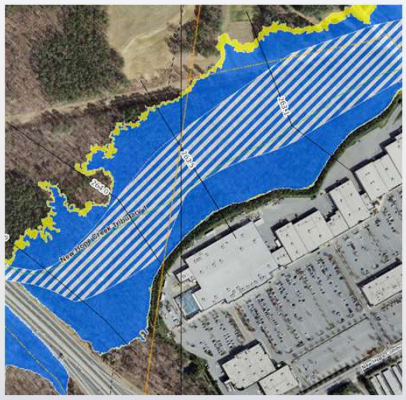
44 CFR Section 65.5 – LOMR-Fs

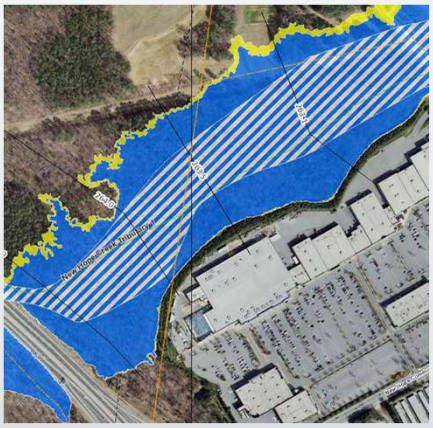
- Requestor must also submit:
  - BFE data prepared by authoritative source
    - Flood Insurance Study report or other reliable source (i.e. Federal / State agency or P.E.)
    - Community acknowledgement form stating **"reasonably safe from flooding"**
- Criteria for removal from SFHA:
  - LAG elevation and low floor must be greater than or equal to BFE



30

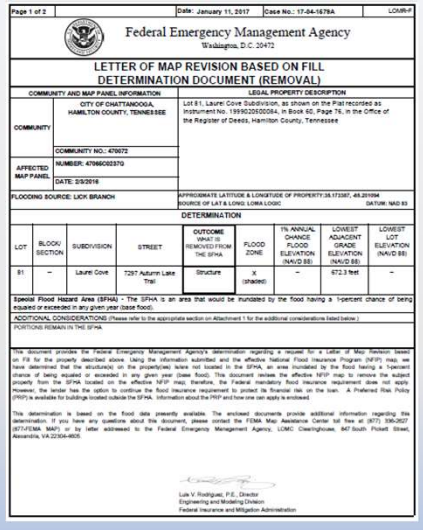
44 CFR Section 65.5 – LOMR-Fs

- Policy-Related Issues:
  - Basement in fill loophole
  - Certification requirements
  - LAG elevation (including deck supports)



44 CFR Part 70 - Procedure for Map Correction

- Procedure for Map Correction:
  - Purpose – To provide procedures for review of scientific or technical submissions from applicant who believes their property has been inadvertently included in SFHA resulting from transposition of curvilinear line to readily identifiable feature



Page 1 of 2 | Date: January 11, 2017 | Case No.: 17-04-1679A | LOMR-F

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION BASED ON FILL
DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION

COMMUNITY	CITY OF CHATTANOOGA, HAMILTON COUNTY, TENNESSEE	
	COMMUNITY NO.: 470072	
AFFECTED MAP PANEL	NUMBER: 47065C0237G	
	DATE: 2/3/2016	
FLOODING SOURCE: LICK BRANCH		

LEGAL PROPERTY DESCRIPTION

Lot 81, Laurel Cove Subdivision, as shown on the Plat recorded as Instrument No. 199902050084, in Book 62, Page 76, in the Office of the Register of Deeds, Hamilton County, Tennessee

APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 35.171387, -85.201694
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)
81	–	Laurel Cove	7297 Autumn Lake Trail	Structure	X (shaded)	–	672.3 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

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 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). 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, 847 South Pickett Street, Alexandria, VA 22304-4605.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

44 CFR Part 70 – Map Corrections

- It is difficult to accurately delineate curvilinear line on effective map (i.e. scale limitations)
- Instances where topography has been altered (fill placed) **prior** to effective date of first NFIP map showing the area in the SFHA can be processed as LOMAs
- Instances where topography has been altered in identified SFHA since date of first NFIP map are subject to Section 65 provisions (processed as LOMR-Fs)

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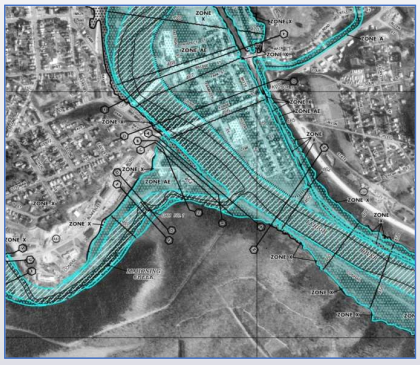
44 CFR Section 70.3 – Right to Submit Technical Information

- Any owner or lessee of property who believes property has been inadvertently included in SFHA, may submit scientific or technical information to FEMA for review
- Submitted information may include:
  - Recorded copy of plat map or deed
  - Copy of effective FIRM/Flood Boundary and Floodway Map (FBFM) indicating location of property
  - LAG elevation certified by P.E. or Licensed Land Surveyor



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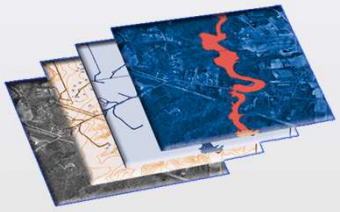
44 CFR Section 70.3 - Right to Submit Technical Information

- Submitted information may also include:
  - Certified topographic mapping
  - LAG elevation (including attached decks and garages)
  - Site map showing surveyed location of structure
  - Indication of curvilinear line that represents area subject to inundation by base flood

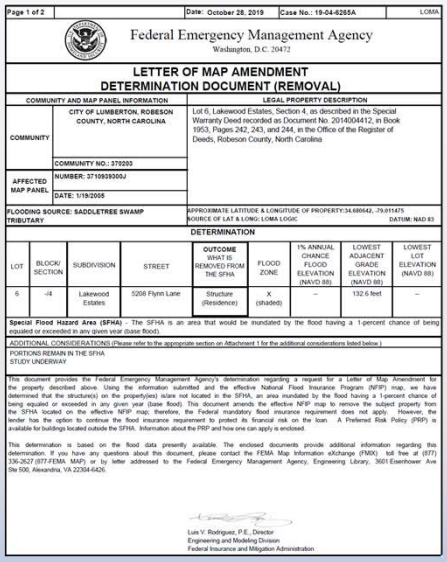


44 CFR Section 70.4 – Review by Director

- FEMA is required to notify applicant in writing of determination within 60 days from date of receipt of scientific or technical information
- One of the original goals of the CFS Program is for FEMA to issue determination response within 5 business days

44 CFR Section 70.5 - LOMAs

- LOMAs must include following information:
  - Name of community to which flood map to be amended was issued
  - FIRM number
  - Legal Property Description and identification of property to be excluded from SFHA



Page 1 of 2 | Date: October 28, 2019 | Case No.: 19-04-6265A | LOMA

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 6, Lakewood Estates, Section 4, as described in the Special Warranty Deed recorded as Document No. 2014004412, in Book 1953, Pages 242, 243, and 244, in the Office of the Register of Deeds, Robeson County, North Carolina
	COMMUNITY NO.: 370200	
AFFECTED MAP PANEL	NUMBER: 3710930930J	
	DATE: 1/19/2005	
FLOODING SOURCE: SADDLETREE SWAMP TRIBUTARY		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 34.686642, -79.011475 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)
6	-/4	Lakewood Estates	5208 Flynn Lane	Structure (Residence)	X (shaded)	--	132.6 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
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). This document amends 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 Information eXchange (FMIX), toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

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44 CFR Section 70.6 - Distribution of LOMAs:

- Copies of LOMA determination should be sent to:
  - Applicant
  - Property owner (if not Applicant)
  - Community Map Repository (with instructions that it should be attached to NFIP map which it is amending)
  - State NFIP Coordinator
  - Community or governmental unit that requests LOMA
  - FEMA's community files

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44 CFR Section 70.7 - Notification of LOMAs

- Notice will not be published in *Federal Register* unless LOMA includes alteration or change to BFEs (pursuant to Section 67)
- Where no change to BFEs has occurred, LOMA provided under Sections 70.5 and 70.6 serves to inform parties affected

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44 CFR Section 70.8 - Premium Refund

- Standard flood insurance policyholder whose property has become subject of issued LOMA under Part 70 may cancel policy* within the current policy year and receive a premium refund under conditions set forth in Section 62.5

***Banks may require flood insurance regardless of whether property is in or out of SFHA**

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44 CFR Section 70.9 - Review of Proposed Projects

- Applicant who is proposing to build on portion of property that is inadvertently in SFHA may request conditional LOMA

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44 CFR Part 72 - Procedures and Fees for Processing Map Changes

- Provides administrative and cost-recovery procedures for engineering review and administrative processing associated with FEMA's response to requests for LOMCs and Physical Map Revisions (PMRs)

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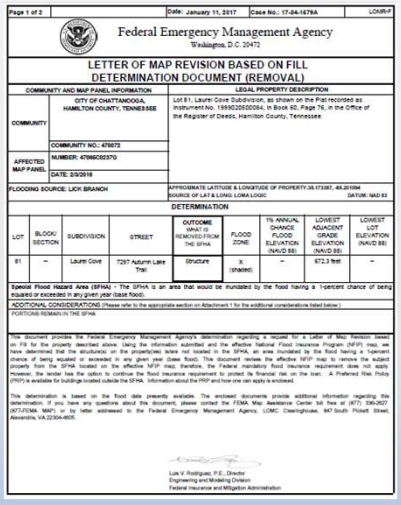
44 CFR Section 72.2 - Definitions for Map Revisions and Letter Actions

- Conditional LOMA, Conditional LOMR, Conditional LOMR-F, LOMA, LOMR, and LOMR-F
- Physical Map Revision (PMR)



Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION BASED ON FILL
DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF CHATTANOOGA, HAMILTON COUNTY, TENNESSEE	Lot 81, Laurel Cove Subdivision, as shown on the Plat recorded as Instrument No. 199902060004, in Book 62, Page 76, in the Office of the Register of Deeds, Hamilton County, Tennessee
	COMMUNITY NO.: 470072	
AFFECTED MAP PANEL	NUMBER: 47065C0237D	
	DATE: 2/5/2018	
FLOODING SOURCE: LICK BRANCH		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 35.173387, -85.201094 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)
81	–	Laurel Cove	7297 Autumn Lake Trail	Structure	X (shaded)	–	672.3 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

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 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). 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, 847 South Pickett Street, Alexandria, VA 22304-4605.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

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Section 72.3 – Fee Schedule

- https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees
- Revisions to the fees, if necessary, shall be published as a notice in the Federal Register.

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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

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Section 72.4 – Submittal/Payment Procedures and FEMA Response

- FEMA must receive fees before review begins; fees are non-refundable when FEMA begins the review
- For LOMA and LOMR-F requests, FEMA:
  - Notifies requestor within 30 days
  - Provides determination letter or other written comment to requester and community within 60 days of receipt of adequate information and fee

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Section 72.5 – Fee Exemptions

- Requesters are exempt from submitting review and processing fees for:
  - (a) Requests for map changes based on mapping or study analysis errors;
  - (b) Requests for map changes based on the effects of natural changes within SFHAs;
  - (c) Requests for a Letter of Map Amendment (LOMA);
  - (d) Requests for map changes based on federally sponsored flood-control projects where 50 percent or more of the project's costs are federally funded;

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Section 72.5 – Fee Exemptions

- Requesters are exempt from submitting review and processing fees for:
  - (e) Requests for map changes based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; and
  - (f) Requests for map changes based on flood hazard information meant to improve upon that shown on the flood map or within the flood study will be exempt from review and processing fees. Improvements to flood maps or studies that partially or wholly incorporate man-made modifications within the special flood hazard area will not be exempt from review and processing fees.

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Section 72.7 - Resubmittals

- Resubmittal requests more than 90 days after denial or termination of review due to insufficient data will be treated as original submissions and will be subject to all submittal/payment procedures

49

Section 72.6 – Unfavorable Response

- Request for LOMR-F may be denied or revisions to FIRM or FBFM may not be in manner or to extent desired by requestor
- Requestor is NOT entitled to any refund if the revision requests are denied or if the determinations do not revise the map specifically as requested.

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Section 72.7 – Resubmittals

- Resubmittal requests more than 90 days after denial or termination of review due to insufficient data will be treated as original submissions and will be subject to all submittal/payment procedures
- This also applies to a resubmitted request if the project on which the request (regardless of when submitted) is based has been altered significantly in design or scope other than as necessary to respond to comments, concerns, or other findings made by FEMA regarding the original submission.

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Potential Violation

- May occur with any re-channelization of a stream or development in the floodway, without first obtaining a no-rise certification or Conditional Letter of Map Revision (CLOMR)
- May include a project (bridges, culverts, grading, fill placement) within the floodway

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Conclusion

- You should:
  - Be comfortable with commonly used terminology
  - Be able to cite mapping related regulations
  - Understand regulations that apply to LOMA and LOMR-F processing
  - Be able to identify regulation violations while processing LOMA and LOMR-F requests

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Quiz

55

NFIP Regulations
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B

General provisions
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-59

Criteria for land management and use
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-60

Insurance coverage and rates
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-61

Sale of insurance and adjustment of claims
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-62

Implementation of section 1306(c) of the National Flood Insurance Act of 1968
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-63

Communities eligible for the sale of insurance
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-64

Identification and mapping of special hazard areas
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-65

Consultation with local officials
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-66

Appeals from proposed flood elevation determinations
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-67

Administrative hearing procedures
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-68

**Procedure for map correction
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-70

Implementation of coastal barrier legislation
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-71

**Procedures and fees for processing map changes
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-72

Implementation of section 1316 of the National Flood Insurance Act of 1968
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-73

Exemption of State-owned properties under self-insurance plan
https://www.ecfr.gov/current/title-44/chapter-I/subchapter-B/part-75

** NFIP regulations for CFS training

NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 3

NFIP Insurance

October 31 - November 3, 2023

1

This Module Will …

- Provide an overview of NFIP flood insurance

2

Who Writes Flood Insurance?

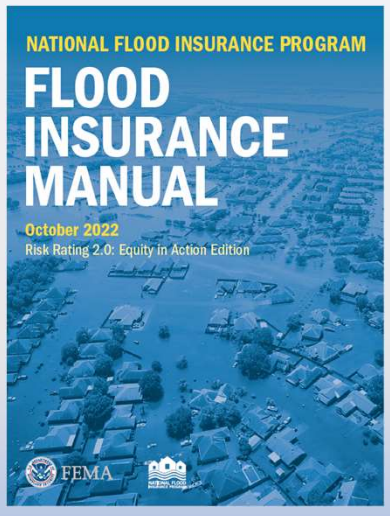
- State Licensed Insurance Agents:
  - Can write property and casualty policies
  - Are in good standing with the licensing department
  - Must meet mandatory training requirements
  - WYO and NFIP Directly

To find a flood insurance provider in your location:

https://www.floodsmart.gov/flood-insurance-provider

3

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

4

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

5

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

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

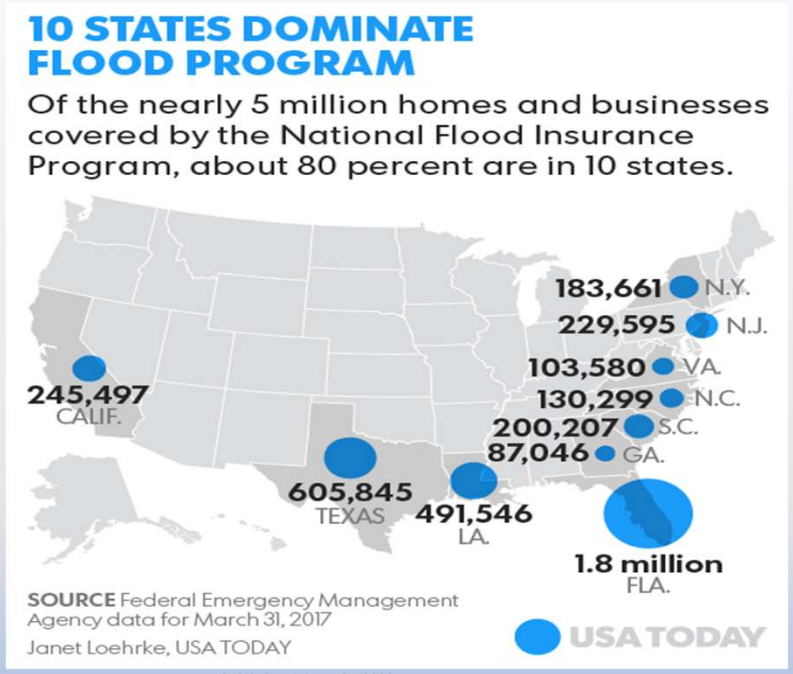
6

Current NFIP Status – Nationwide

- Policies In Force: 4,705,979
- Insurance In Force: $1,281,857,821,400
- Premium: $3,681,566,985
- Participating Communities: 22,646
- Non-Participating Communities: 2,160

7

Top Ten States By NFIP Flood Policy Count



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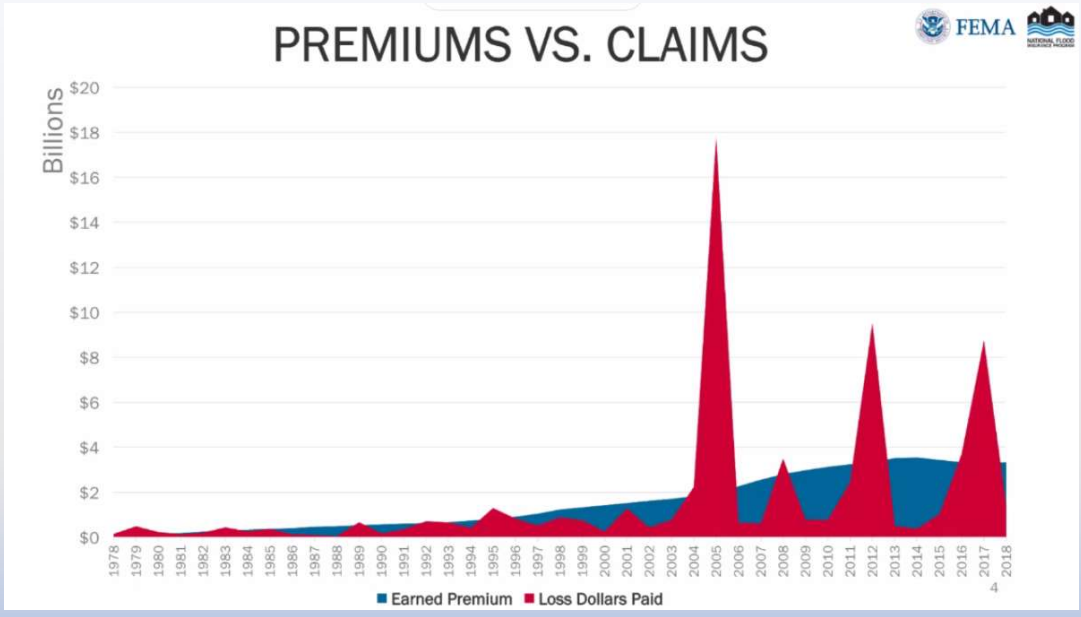
NFIP Policies by State – August 2023

	State	Policies in Force	Insurance In Force
1	Florida	1,344,497	$356,485,352,000
2	Texas	561,419	$171,173,851,000
3	Louisiana	401,006	$115,208,791,000
4	California	154,352	$47,195,883,000
5	New Jersey	178,278	$46,933,011,000
6	South Carolina	158,450	$44,092,846,000
7	New York	136,318	$39,254,001,000
8	North Carolina	110,535	$30,508,601,000
9	Virginia	79,230	$22,322,211,000
10	Georgia	61,283	$17,630,579,000

9



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Real Estate Flood Risk Disclosure

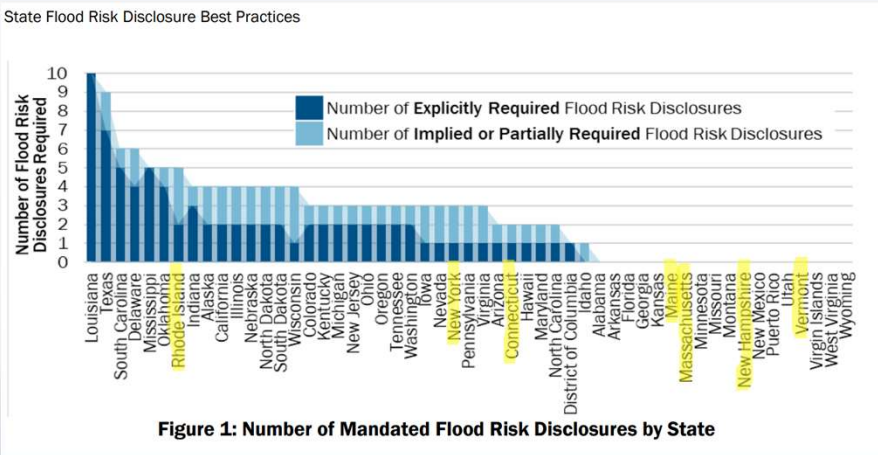
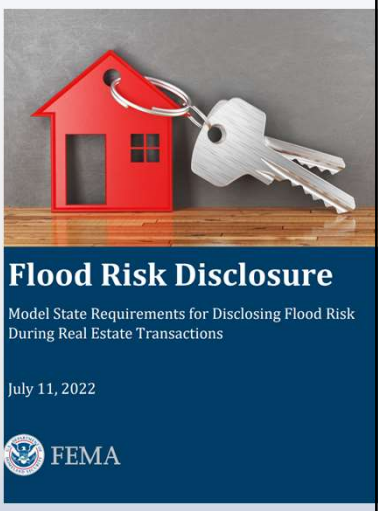


Figure 1: Number of Mandated Flood Risk Disclosures by State



https://www.fema.gov/sites/default/files/documents/fema_state-flood-risk-disclosure-best-practices_07142022.pdf

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NFIP Policies by State

STATE	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
CONNECTICUT	25,506	25,477	25,495	25,418	25,431	25,367	25,357	25,330	25,300	25,233	25,189	25,114	24,947
MAINE	6,658	6,642	6,618	6,617	6,616	6,593	6,573	6,594	6,601	6,594	6,579	6,559	6,544
MASSACHUSETTS	41,376	41,252	41,142	41,099	41,048	40,998	41,007	40,987	40,975	40,931	40,845	40,829	40,800
NEW HAMPSHIRE	5,678	5,662	5,637	5,631	5,601	5,606	5,609	5,596	5,578	5,554	5,557	5,533	5,505
NEW YORK	140,640	140,544	141,140	141,229	141,254	141,205	141,129	141,004	140,846	140,663	140,499	140,106	139,742
RHODE ISLAND	9,277	9,232	9,197	9,178	9,179	9,180	9,160	9,163	9,166	9,175	9,181	9,187	9,189
VERMONT	3,121	3,127	3,123	3,109	3,097	3,088	3,082	3,072	3,048	3,024	3,019	3,012	3,001

STATE	CIF Growth	CIF % Growth
CONNECTICUT	-559	-2.19%
MAINE	-114	-1.71%
MASSACHUSETTS	-576	-1.39%
NEW HAMPSHIRE	-173	-3.05%
NEW YORK	-898	-0.64%
RHODE ISLAND	-88	-0.95%
VERMONT	-120	-3.84%

Source: FEMA

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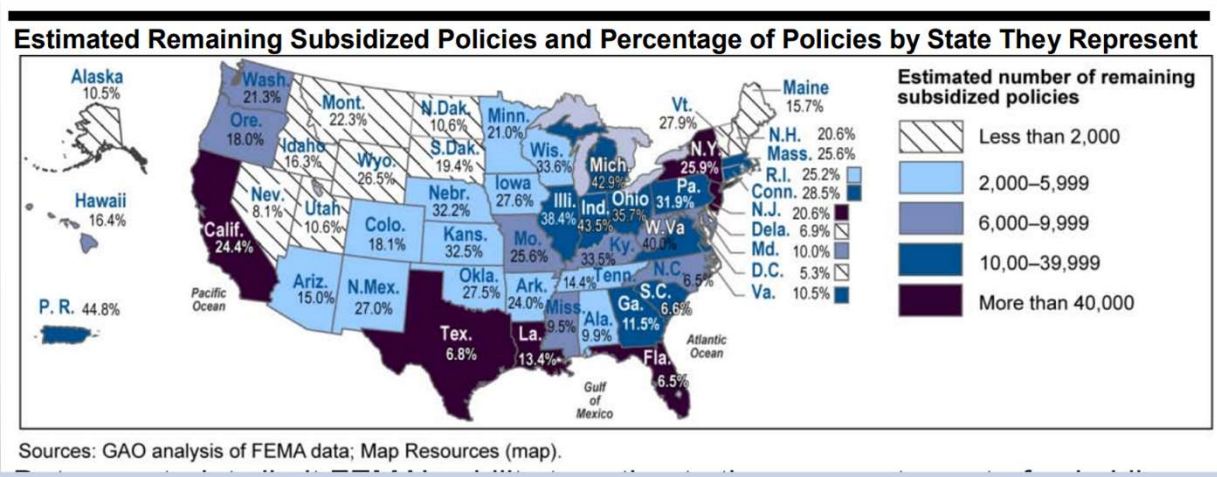
Subsidized Policies



Sources: GAO analysis of FEMA data; Map Resources (map).

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Flood Insurance Facts for MA

- $45.69 billion dollars in general building stock in coastal MA
  (MassGIS, FEMA HAZUS loss estimation, 2018 state plan, p. 4-118)
- Only $13.1 billion dollars is covered by the NFIP policy (FEMA CIS on 10/4/19)

MORE THAN $32.5 BILLION DOLLARS WORTH OF COASTAL PROPERTY IN MA IS NOT COVERED FOR FLOOD DAMAGES

Total residential damage in Houston from Hurricane Harvey
was more than $2.3 billion.
70% of damages from Harvey were not insured.
(CoreLogic August 22, 2018)

One month after Hurricane Harvey. Source: Chicago Tribune ©
Information for slide provided by MA DCR NFIP

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Definition of Flood
Flood Insurance Manual, Appendix K

- A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more properties (at least 1 of which is the policyholder's property) from:
- Overflow of inland or tidal waters; or
- Unusual and rapid accumulation or runoff of surface waters from any source;
- or mudslides, flood-related erosion)

15

Community Rating System (CRS)

- Voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the National Flood Insurance Program (NFIP).
- Over 1,500 communities participate nationwide.
- In CRS communities, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community's efforts that address the three goals of the program:
  - Reduce and avoid flood damage to insurable property
  - Strengthen and support the insurance aspects of the National Flood Insurance Program
  - Foster comprehensive floodplain management

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Community Rating System (CRS)

Classifications are based on 19 creditable activities, organized in four categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Warning and Response

CRS Credit Points, Classes and Premium Discounts

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

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State	Participating Communities	Non-participating communities	Regular Program	Suspended from the Regular Program	Emergency Program	Regular Program NSHA	CRS communities
CT	177	0	177	0	0	0	19
MA	341	9	338	1	3	1	25
ME	992	27	992	10	0	429	22
NH	219	12	218	2	1	1	6
NY	1505	8	1505	6	0	76	53
RI	40	0	40	0	0	0	11
VT	246	21	234	5	12	2	7

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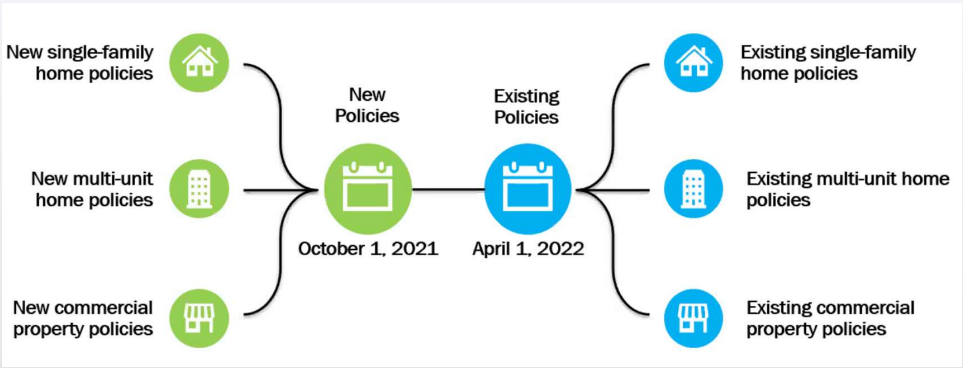
Risk Rating 2.0

- 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

19

Risk Rating 2.0



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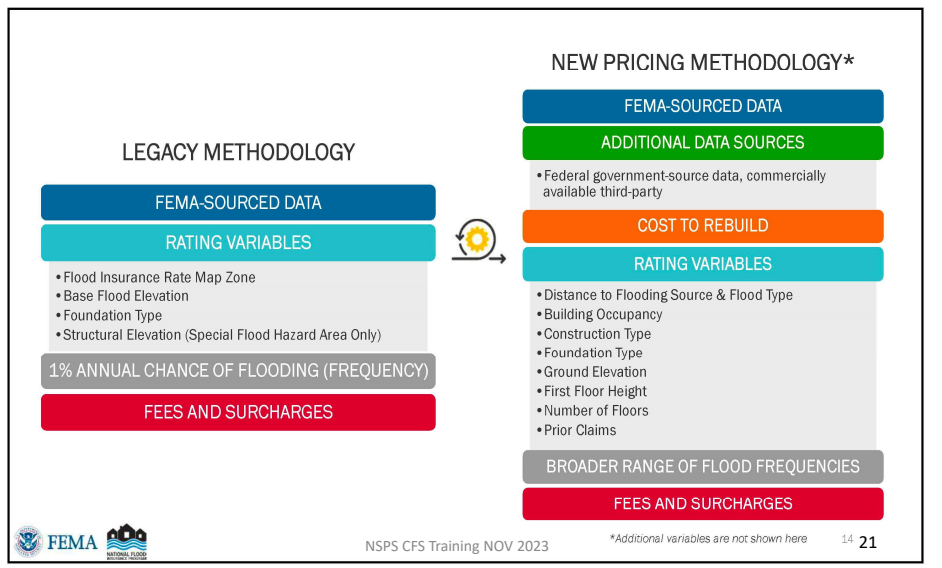
Risk Rating 2.0



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What has not changed?

- 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)

22

What has changed?

- 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

23

What has changed?

- FEMA is phasing out/eliminating:
  - Preferred Risk Policy (PRP)
  - Mortgage Portfolio Protection Program (MPPP)
  - Submit for Rate
- All will be replaced with actuarial rates
- The policy premium will not exceed $12,125 per year for a single-family residential structure
- Under the legacy rating, policy premiums could exceed $45,00 per year.

24

Fees, Surcharges, and Assessments

What has changed

- 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

What has not changed

Policy (HFIAA) Surcharge
- Primary Residence = $25
- All other policies - $250

Probation Surcharge = $50

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

25

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

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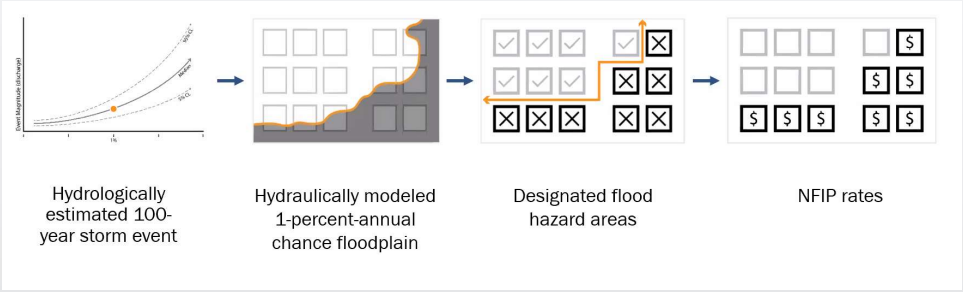
Legacy Deterministic Approach



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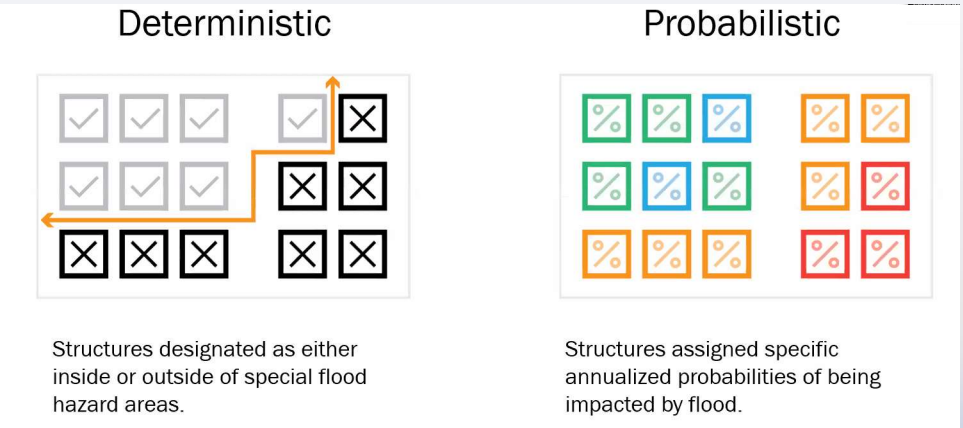
Shift to Probabilistic Approach



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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)

30

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

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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

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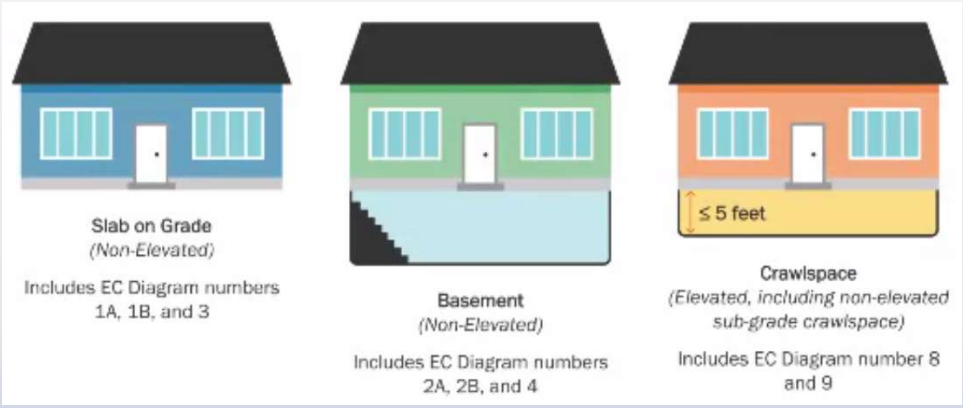
Rating Variables: Foundation Types



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

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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

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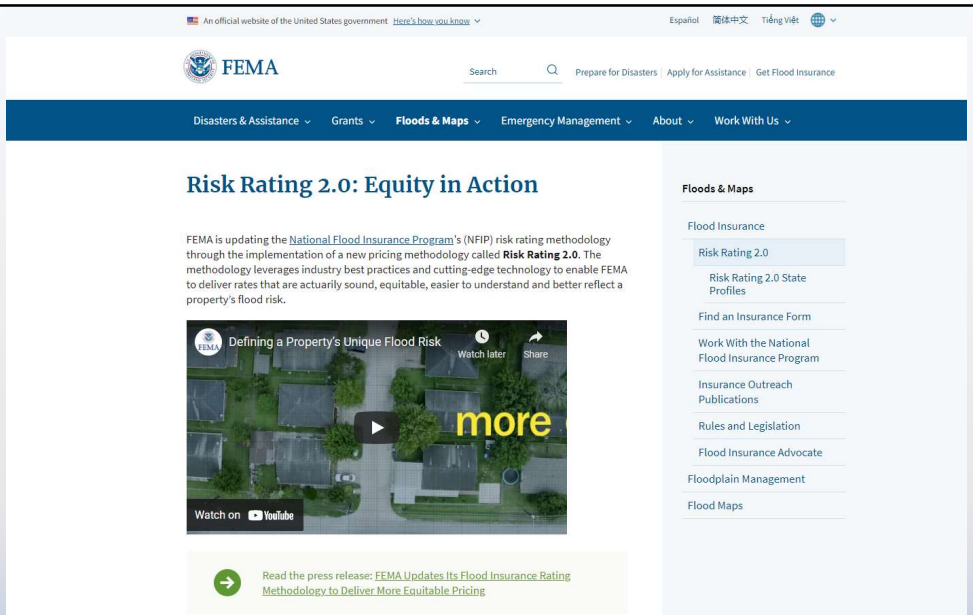
Full-Risk Premium

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

35



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

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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
- 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/

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Apply for Hazard Mitigation Assistance Grants

Hazard Mitigation Assistance (HMA) grants are available for pre-disaster and post-disaster mitigation projects. As of October 1, 2021 for new policyholders and April 1, 2022 for existing policyholders, projects involving installing flood openings per 44 CFR 60.3 criteria, elevating structures, and elevating machinery and equipment above the first floor (i.e. hot water heaters) may reduce rates both inside and outside SFHAs. For detailed information, refer to the "Risk Rating 2.0 Equity in Action" fact sheet.

HMA Program	Program Information
Flood Mitigation Assistance (FMA)	• Pre-Disaster grant program • Obligations of $1.4 billion from 2004 to 2021 • More information: https://www.fema.gov/grants/mitigation/floods
Building Resilient Infrastructure and Communities (BRIC)	• Pre-disaster grant program • Obligations of $1.2 billion from 2020 to 2021 • More information: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
Hazard mitigation Assistance Grant Program (HMGP) and HMGP Post Fire	• Post-disaster grant program • Obligations of $15.3 billion from 1990 to 2021 • More information https://www.fema.gov/grants/mitigation/hazard-mitigation and https://www.fema.gov/grants/mitigation/post-fire

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Quiz

40

Certified Floodplain Surveyor (CFS) Quiz

NFIP Regulations

1. Regulations of the NFIP are a *minimum* or a *maximum* requirement for participating communities?

2. What Part of the NFIP regulations address LOMA and CLOMA processing?

3. What Section of the NFIP regulations address floodplain management criteria for floodprone areas?

4. FEMA is required to provide a determination for LOMA requests within _____ days of receiving a complete submittal.

5. True/False: Once a favorable LOMA determination is issued, banks are not allowed to require flood insurance.

6. True/False: NFIP regulations are in place in an effort to stop flooding from happening.

7. Pre-FIRM subsidized rates for secondary homes can increase up to _____% per year.

NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 4

Elevation Certificate

October 31, November 3, 2023

1

This course will …

- Provide detailed information on the uses and completion of the Elevation Certificate
- Identify common problems in completing Elevation Certificates

2

What is the purpose of the Elevation Certificate?

- ~~Flood Insurance Policy Rating~~ (pre- RR 2.0)
- Verify Regulatory compliance
- Support of applications for map revisions & amendments
- Required for CRS program – 90% correct

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.

3

Community's EC Review

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

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

If questions arise, community officials should discuss with the professional for clarification or correction.

Some communities use a memorandum of correctness

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

4

CRS & 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. (Annually submitted to FEMA for accuracy review)
- This requirement applies to all new construction and substantial improvements to existing structures located in SFHAs.

5

How to save money on flood insurance?

- The Community Rating System (CRS) offers insurance premium discounts (up to 45%) for individuals in communities implementing floodplain management practices that exceed the minimum requirements of the NFIP.
- By implementing CRS floodplain management best practices, flood losses are reduced, public safety is enhanced, & the cost of flood insurance is decreased

6

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

Pre-FIRM | Post-FIRM

7

FEMA

Community Status Book Report

Communities Participating in the National Flood Program

MAINE

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
230406#	ABBOT, TOWN OF	PISCATAQUIS COUNTY	02/14/75	09/15/78	09/30/93	09/15/78	No					
230190#	ACTON, TOWN OF	YORK COUNTY	02/21/75	06/05/85	06/05/85	06/05/85	No					
230688#	ADAMSTOWN T04 R02 WBKP, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230132A	ADDISON, TOWN OF	WASHINGTON COUNTY	10/18/74	07/16/91	07/18/17	07/16/91	No					
230606#	ALBANY, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230231#	ALBION, TOWN OF	KENNEBEC COUNTY	02/21/75	09/27/85	06/16/11	09/27/85	No					
230713	ALDER BROOK T3 R3 NBKP, TOWNSHIP OF	SOMERSET COUNTY			(NSFHA)	04/30/84	No					
230852	ALDER STREAM T02 R08 WBKP, TOWNSHIP OF	FRANKLIN COUNTY			(NSFHA)	04/30/84	No					
230303A	ALEXANDER, TOWN OF	WASHINGTON COUNTY	12/06/74	09/04/85	07/18/17(M)	09/04/85	No					
230191#	ALFRED, TOWN OF	YORK COUNTY	02/21/75	07/16/90	05/18/98	07/16/90	No	10/01/91	10/01/93	8	10%	05%
230440#	ALLAGASH, TOWN OF	AROOSTOOK COUNTY	02/14/75	08/05/85	04/02/03	08/05/85	No					
	FORMERLY ALLAGASH PLANTATION											
230083A	ALNA, TOWN OF	LINCOLN COUNTY	01/03/75	03/01/05	07/16/15(M)	03/01/05	No					
230101	ALTON, TOWN OF	PENOBSCOT COUNTY	02/28/75	09/18/85	09/18/85(M)	09/18/85	No					
230272A	AMHERST, TOWN OF	HANCOCK COUNTY	01/24/75	07/20/16	07/20/16(M)	02/22/17	No					
230418	AMITY, TOWN OF	AROOSTOOK COUNTY	01/17/75	08/19/85	08/19/85(M)	08/19/85	No					
230689#	ANDOVER NORTH SURPLUS, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230690#	ANDOVER WEST SURPLUS, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230160#	ANDOVER, TOWN OF	OXFORD COUNTY	11/08/74	01/03/85	07/07/09	01/03/85	No					
230967A	ANDREWS ISLAND	KNOX COUNTY		02/23/01	07/06/16	04/30/84	No					
230123#	ANSON, TOWN OF	SOMERSET COUNTY	07/23/76	07/15/88	07/03/95	07/15/88	No					
230714	APPLETON T6 R7 BKP WKR, TOWNSHIP OF	SOMERSET COUNTY			(NSFHA)	04/30/84	No					
230073A	APPLETON, TOWN OF	KNOX COUNTY	08/02/74	12/04/85	07/06/16	12/04/85	No					
230464	ARGYLE, TOWNSHIP OF	PENOBSCOT COUNTY	02/21/75	09/18/85	09/18/85(M)	09/18/85	No					
230208#	ARROWSIC, TOWN OF	SAGADAHOC COUNTY	01/17/75	05/15/91	07/16/15	05/15/91	No	10/01/93	10/01/18	8	10%	05%

8

CRS Status Included in the CSB

FEMA

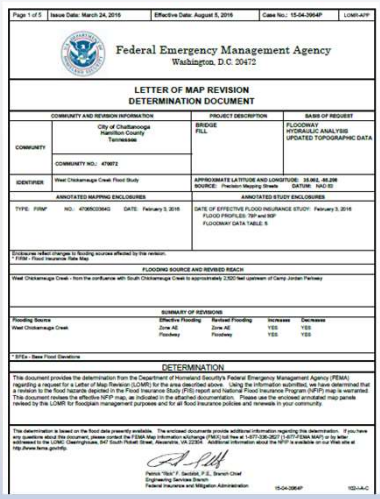
Community Status Book Report

MASSACHUSETTS

CID	Community Nam	CRS Entry Date	Curr Eff Date	Curr Class	% Disc SFHA	% Disc Non SFHA
250124#	NORTHFIELD, TOWN O	10/01/91	10/01/91	9	05%	05%
250060D	NORTON, TOWN OF					
250276E	NORWELL, TOWN OF					
250248#	NORWOOD, TOWN OF					
250072B	OAK BLUFFS, TOWN O					
250324#	OAKHAM, TOWN OF					
250125#	ORANGE, TOWN OF	10/01/93	10/01/18	7	15%	05%
250010#	ORLEANS, TOWN OF					
250035#	OTIS, TOWN OF					
250325C	OXFORD, TOWN OF					
250147#	PALMER, TOWN OF					
250326C	PAXTON, TOWN OF					
250099#	PEABODY, CITY OF					
250277E	PEMBROKE, TOWN OF					
250210#	PEPPERELL, TOWN OF					
250327#	PETERSHAM, TOWN O					
250328#	PHILLIPSTON, TOWN					
250037#	PITTSFIELD, CITY OF					
250249D	PLAINVILLE, TOWN OF	10/01/91	10/01/91	9	05%	05%
250278E	PLYMOUTH, TOWN OF					
250279E	PLYMPTON, TOWN OF					
250329#	PRINCETON, TOWN O	10/01/11	04/01/21	8	10%	05%
255218#	PROVINCETOWN, TOW	10/01/93	05/01/19	7	15%	05%
255219#	QUINCY, CITY OF					

9

Support map amendments & revisions



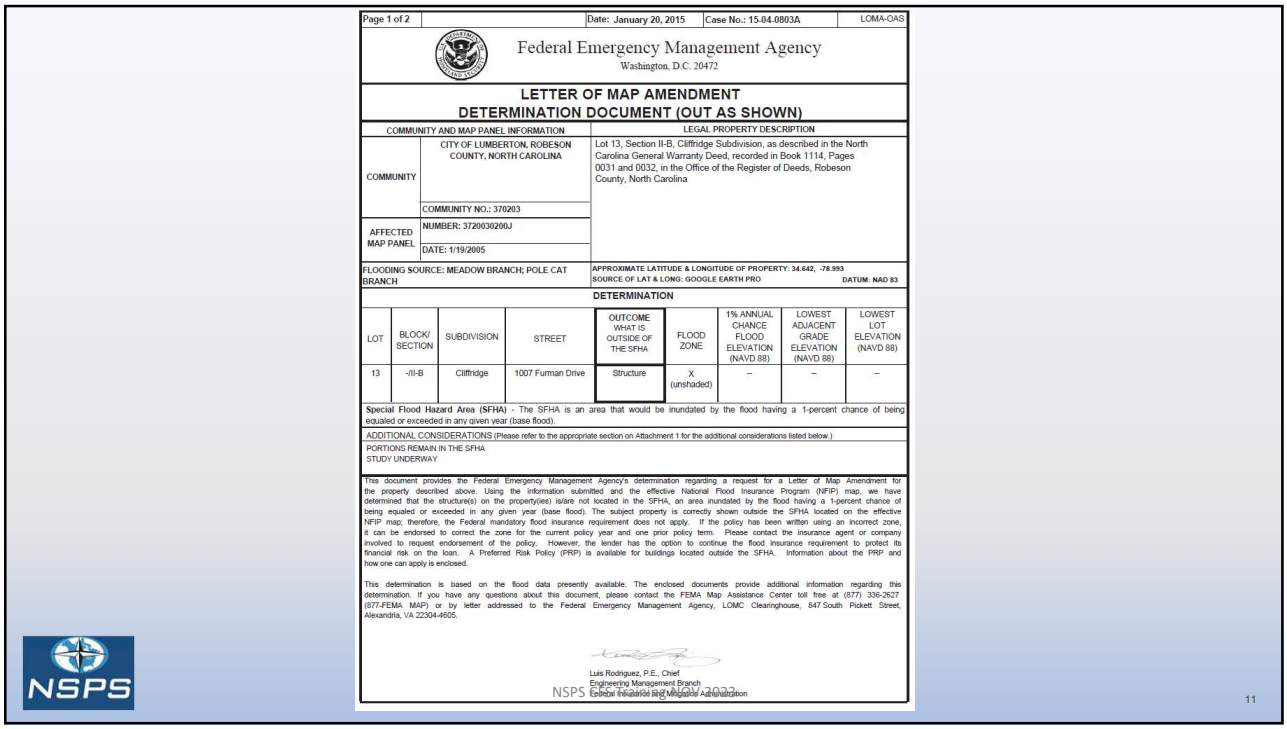
Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT

The Elevation Certificate can be used to support updating 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.

10



Page 1 of 2 | Date: January 20, 2015 | Case No.: 15-04-0803A | LOMA-OAS

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: 3720030206J	
	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

11

Adding fill to raise the LAG?

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Current EC Form

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

OMB Control No. 1660-0008
Expiration Date: 06/30/2026

ELEVATION CERTIFICATE
IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19
Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

- 2022 Edition
  - Released July 7, 2023
  - Expires on June 30, 2026
  - Downloadable at: https://www.fema.gov/sites/default/files/documents/fema_form-ff-206-fy-22-152.pdf
- 2019 Edition may be used is signed or certified prior to November 1, 2023

13

Current EC Form

- 2022 Edition
  - Released July 7, 2023
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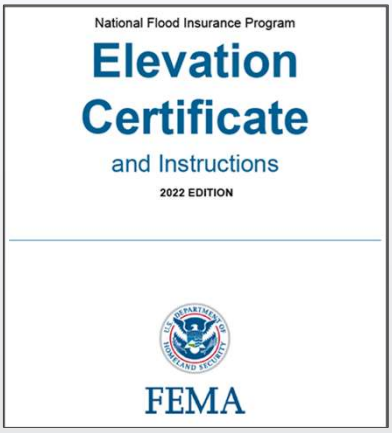
- 2019 Edition may be used is signed or certified prior to November 1, 2023



National Flood Insurance Program

Elevation Certificate

and Instructions

2022 EDITION

FEMA

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

OMB Control No. 1660-0008
Expiration Date: 06/30/2026

ELEVATION CERTIFICATE
IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19
Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

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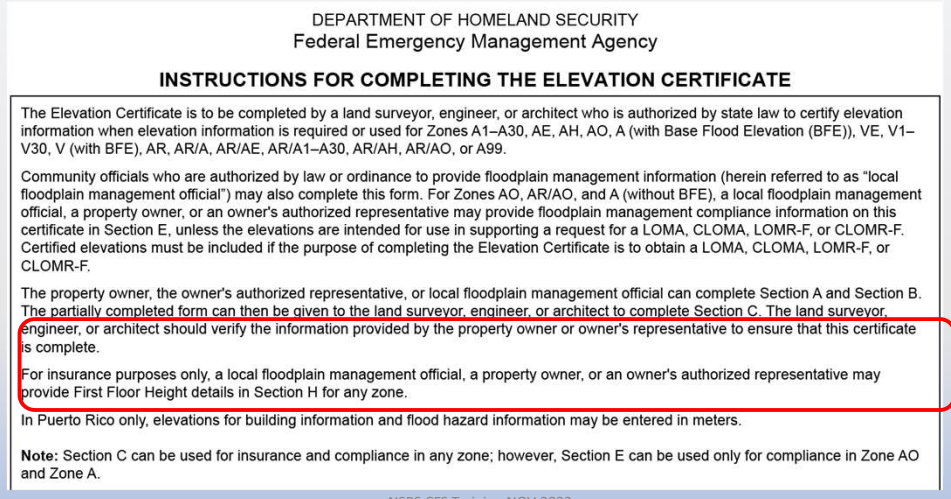
Elevation Certificate Instructions



DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency

INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by state law to certify elevation information when elevation information is required or used for Zones A1–A30, AE, AH, AO, A (with Base Flood Elevation (BFE)), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, or A99.

Community officials who are authorized by law or ordinance to provide floodplain management information (herein referred to as "local floodplain management official") may also complete this form. For Zones AO, AR/AO, and A (without BFE), a local floodplain management official, a property owner, or an owner's authorized representative may provide floodplain management compliance information on this certificate in Section E, unless the elevations are intended for use in supporting a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA, CLOMA, LOMR-F, or CLOMR-F.

The property owner, the owner's authorized representative, or local floodplain management official 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.

For insurance purposes only, a local floodplain management official, a property owner, or an owner's authorized representative may provide First Floor Height details in Section H for any zone.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

Note: Section C can be used for insurance and compliance in any zone; however, Section E can be used only for compliance in Zone AO and Zone A.

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Elevation Certificate Sections

Section A – Property Information
Section B – Flood Insurance Rate Map (FIRM) Information
Section C – Building Elevation Information
Section D – Surveyor, Engineer, or Architect Certification
Section E – Building Measurement Information (Zones without BFE)
Section F – Property Owner Certification
Section G – Community Information
Section H – Building's First Floor Height Information (For Insurance Purposes Only)
Section I – Property Owner Certification

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Section A: 1-3

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 (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number:	

- Complete all items, except "For Insurance Company Use".
- A1. Building Owner's(s') Name(s)
- A2. Building Street Address - 911 address of building location.
- A3. If the address is a rural route or P.O. box, enter the lot & 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..

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Section A: 4-5

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.):	
A5. Latitude/Longitude: Lat. Long. Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84	

- 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 center of the front of the building
  - Decimal degrees to six decimal places or better
  - Degrees, minutes, seconds – provide seconds to two decimal places or better
  - Provide horizontal datum – FEMA prefers NAD 1983

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Section A: 6

ELEVATION CERTIFICATE
IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19
BUILDING PHOTOGRAPHS
See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:

City: _____ State: _____ ZIP Code: _____

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

Instructions: Insert below at least two and when possible four photographs showing each side of the building (for example, may only be able to take front and back pictures of townhouses/rowhouses). Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." Photographs must show the foundation. When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.

Photo One

Photo One Caption: _____ Clear Photo One

- 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.
- 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

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Section A: 7

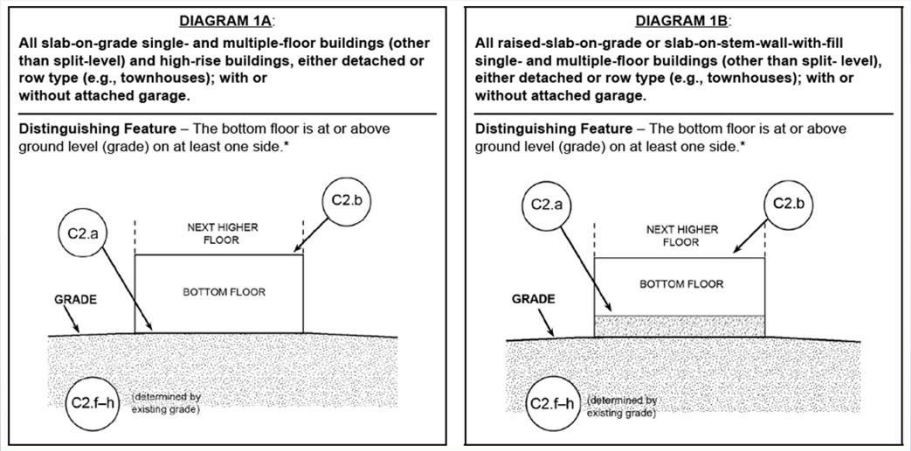


DIAGRAM 1A:

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.*

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.*

20

Section A: 7

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.*

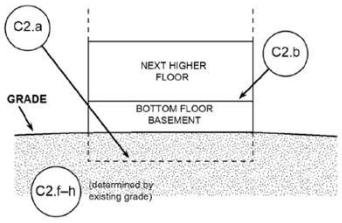
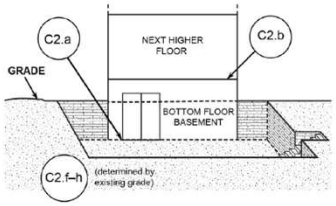


DIAGRAM 2B:

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.

21

Section A: 7

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.*

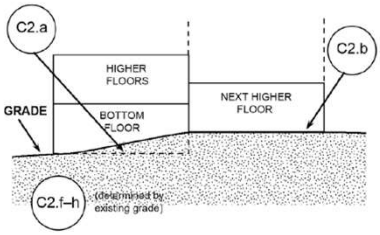
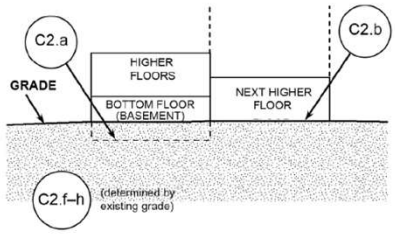


DIAGRAM 4:

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.*



22

Section A: 7

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).

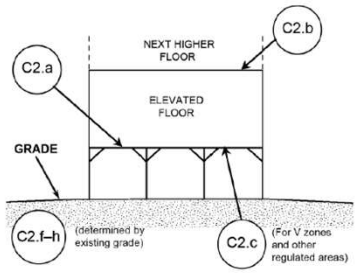
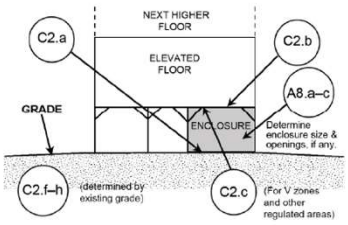


DIAGRAM 6:

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.



23

Section A: 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.

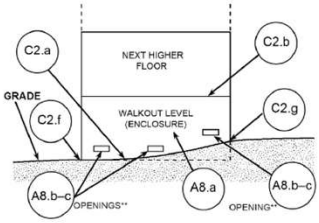
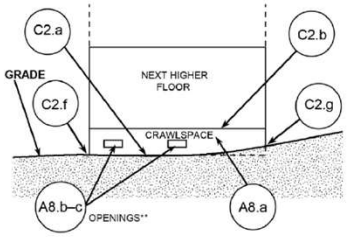


DIAGRAM 8:

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. (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, use Diagram 7.)



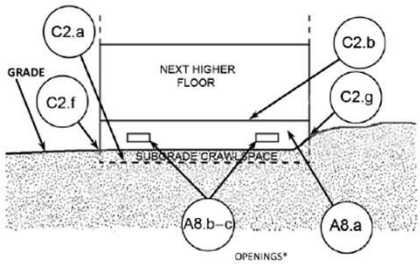
24

Section A: 7

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 five feet, or the crawlspace floor is more than two feet below the grade [LAG] on all sides, use Diagram 2A or 2B.)



25

Section A: 8

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

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

b) Is there at least one permanent flood opening on two different sides of each enclosed area? ☐ Yes ☐ No ☐ N/A

c) Enter number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade:
Non-engineered flood openings: _____ Engineered flood openings: _____

d) Total net open area of non-engineered flood openings in A8.c: _____ sq. in.

e) Total rated area of engineered flood openings in A8.c (attach documentation – see Instructions): _____ sq. ft.

f) Sum of A8.d and A8.e rated area (if applicable – see Instructions): _____ sq. ft.

26

Enclosures and Flood Openings

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

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Minimum Requirements for Flood 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 without human intervention.
  - A window, a door, or a garage door is NOT considered an opening
  - Openings may be installed in doors

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Minimum Requirements for Flood Openings

- Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the 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.
- For more guidance on openings, see NFIP Technical Bulletin 1.

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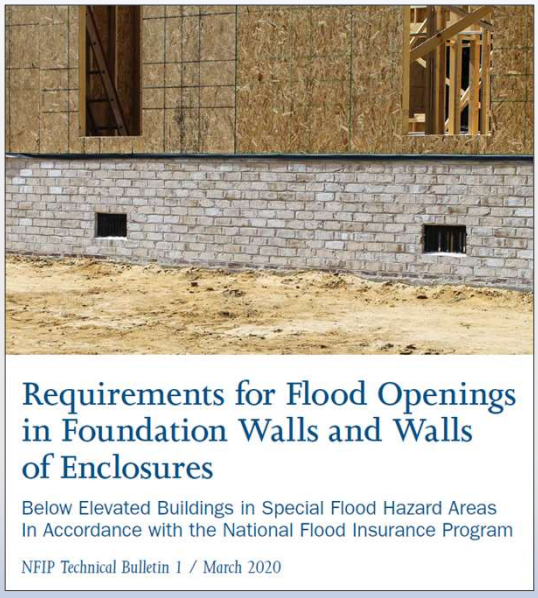


Requirements for Flood Openings in Foundation Walls and Walls of Enclosures

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

NFIP Technical Bulletin 1 / March 2020

NFIP ELEVATION CERTIFICATE COMMENTS

The comment section of the NFIP Elevation Certificate should be used to note characteristics of enclosures and flood openings that comply with the requirements but that, without close inspection, may appear to be non-compliant. In particular, without clarifying comments on engineered openings, local officials and insurance agents may inadvertently determine that enclosures are non-compliant and deem the floor of the enclosure the lowest floor, resulting in unnecessarily high NFIP flood insurance premiums.

30

Section A: 8a

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

- 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).
- If there is no crawlspace or enclosure, enter "N/A" for Items A8.a-f.

31

Section A: 8b

b) Is there at least one permanent flood opening on two different sides of each enclosed area? ☐ Yes ☐ No ☐ N/A

- Indicate if there is at least one permanent flood opening within 1.0 foot of the adjacent grade on at least two exterior walls of each enclosed area identified in A8.a.
- If the crawlspace or enclosure(s) have no permanent flood openings, or if none of the openings are within 1.0 foot above adjacent grade, enter “0” (zero) in Item A8.c-f.
- If there is no crawlspace or enclosure, enter “N/A”.

32

Section A: 8c

c) Enter number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade:
Non-engineered flood openings: Engineered flood openings:

- Enter the total number of permanent non-engineered and/or engineered 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.
- If the interior grade elevation is used, note this in the Comments area of Section D.

33

Section A: 8d

d) Total net open area of non-engineered flood openings in A8.c: sq. in.

- Enter the total measured net open area of permanent non-engineered flood openings indicated in A8.c in square inches, excluding any bars, louvers, or other covers of the permanent flood openings.
- Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area.
- If the net open area cannot be measured, provide in the Comments area of the appropriate section the size of the flood openings without consideration of any covers and indicate the type of cover that exists in the flood openings.

34

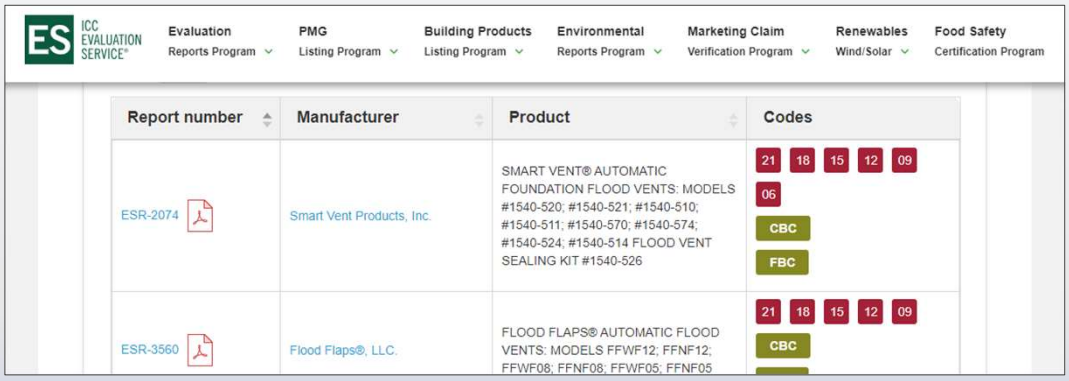
Section A: 8e

e) Total rated area of engineered flood openings in A8.c (attach documentation – see Instructions): _____ sq. ft.

- Enter the total rated area of the permanent engineered flood openings indicated in A8.c, in square feet.
- Attach a copy of the Individual Engineered Flood Openings Certification for a specific building or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) for all engineered openings, and indicate the manufacturer's name and model number in the Comments area of the appropriate section, if applicable. Flood openings cannot be considered engineered flood openings without documentation.
- If no documentation is available/provided, enter the net open (unobstructed) area of the flood openings in A8.d instead.

35

International Code Council Evaluation Service (ICC ES)



36

International Code Council Evaluation Service (ICC ES)

ES ICC EVALUATION SERVICE

www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

ICC-ES Evaluation Report

ESR-4332

Reissued March 2022
Revised April 2022
This report is subject to renewal March 2024.

37

International Code Council Evaluation Service (ICC ES)

TABLE 1—FREEDOM FLOOD VENT®

MODEL NAME	MODEL NUMBER	MODEL SIZE	COVERAGE (sq. ft.)
Freedom Flood Vent®	FFV-1608	$15^{3}/_{4}$" X $8^{1}/_{16}$"	250

For **SI:** 1 inch = 25.4 mm

FIGURE 1—MODEL FFV-1608 FREEDOM FLOOD VENT®: SHOWN WITH COVER REMOVED

FIGURE 2—MODEL FFV-1608 FREEDOM FLOOD VENT®: SHOWN WITH FLOOD DOOR PIVOTED OPEN

38

Section A: 8f

f) Sum of A8.d and A8.e rated area (if applicable – see Instructions): _____ sq. ft.

- Complete only if permanent engineered and permanent non-engineered flood openings are both present. Enter the sum of A8.d (net open area of all non-engineered openings) and A8.e (total rated area of all engineered openings).
- Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. For example, a non-engineered opening with 140 sq. in. of net open area (i.e., rated for 140 sq. ft. of enclosure area), combined with two (2) engineered openings rated for 200 sq. ft. each, would yield 140 + 400 = 540 sq. ft. rated area.
- If either A8.d or A8.e is "0", then enter "N/A" for A8.f.

39

40

41

NSPS CFS Training NOV 2023 43

43

NSPS CFS Training NOV 2023 44

44

Plexiglas cover. This is a violation!!

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45

Spray foam insulation. This is a violation!!

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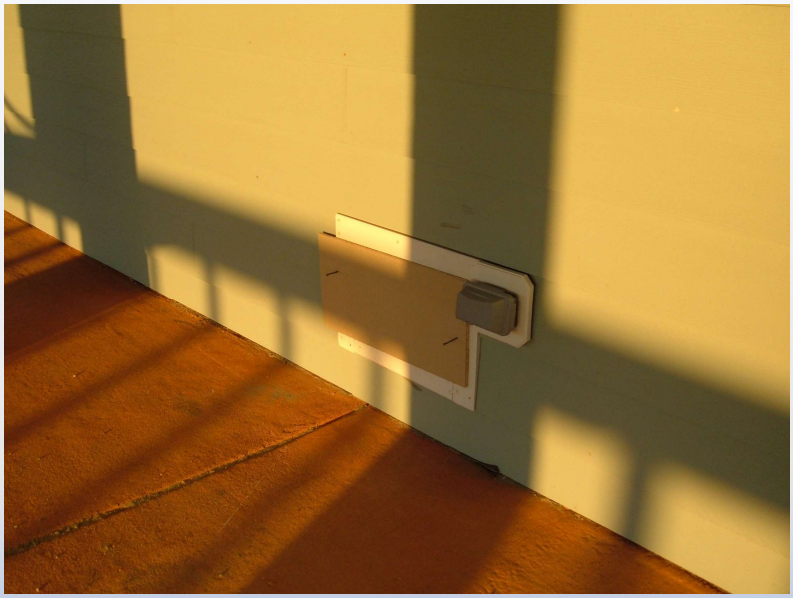
46

NSPS CFS Training NOV 2023

47

47



NSPS CFS Training NOV 2023

48

48

49

50

Section A: 9

A9. For a building with an attached garage:

a) Square footage of attached garage: _____ sq. ft.

b) Is there at least one permanent flood opening on two different sides of the attached garage? ☐ Yes ☐ No ☐ N/A

c) Enter number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade:
Non-engineered flood openings: _____ Engineered flood openings: _____

d) Total net open area of non-engineered flood openings in A9.c: _____ sq. in.

e) Total rated area of engineered flood openings in A9.c (attach documentation – see Instructions): _____ sq. ft.

f) Sum of A9.d and A9.e rated area (if applicable – see Instructions): _____ sq. ft.

51

Attached Garage vs. Enclosure

Attached Garage – Complete A9 and C2d

Enclosure – Complete A8 and insert N/A for C2d

52

Section A: 9a

a) Square footage of attached garage: _____ sq. ft.

- Provide the square footage of the attached garage with or without permanent flood openings.
- Take the measurement from the outside of the garage.
- If there is no attached garage, enter "N/A" for items A9.a-f.

53

Section A: 9b

b) Is there at least one permanent flood opening on two different sides of the attached garage? ☐ Yes ☐ No ☐ N/A

- Indicate if there is at least one permanent flood opening within 1.0 foot of the adjacent grade on at least two exterior walls of the attached garage identified in A9.a.
- If the attached garage has no permanent flood openings, or if none of the openings are within 1.0 foot above adjacent grade, enter “0” (zero) in Items A9.c-f.
- If there is no attached garage, enter “N/A”.

54

Section A: 9c

c) Enter number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade:
Non-engineered flood openings: Engineered flood openings:

- Enter the total number of permanent non-engineered and/or engineered 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.
- This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade.
- If the interior grade elevation is used, note this in the Comments area of Section D.

55

Section A: 9d

d) Total net open area of non-engineered flood openings in A9.c: sq. in.

- Enter the total measured net open area of permanent non-engineered flood openings indicated in A9.c in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A9.d.
- Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area.
- If the net open area cannot be measured, provide in the Comments area of the appropriate section the size of the flood openings without consideration of any covers and indicate the type of cover that exists in the flood openings.

56

Section A: 9e

e) Total rated area of engineered flood openings in A9.c (attach documentation – see Instructions): sq. ft.

- Enter the total rated area of the permanent engineered flood openings indicated in A9.c in square feet.
- Attach a copy of the Individual Engineered Flood Openings Certification for a specific building or an Evaluation Report issued by the ICC ES for all engineered openings, and indicate the manufacturer's name and model number in the Comments area of the appropriate section, if applicable.
- Flood openings cannot be considered engineered flood openings without documentation.
- If no documentation is available/provided, enter the net open (unobstructed) area of the flood openings in A9.d instead.

57

Section A: 9f

f) Sum of A9.d and A9.e rated area (if applicable – see Instructions): sq. ft.

- Complete only if permanent engineered and permanent non-engineered flood openings are both present. Enter the sum of A9.d (net open area of all non-engineered openings) and A9.e (total rated area of all engineered openings).
- Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. For example, a non-engineered opening with 140 sq. in. of net open area (i.e., rated for 140 sq. ft. of enclosure area), combined with two (2) engineered openings rated for 200 sq. ft. each, would yield 140 + 400 = 540 sq. ft. rated area.
- If either A9.d or A9.e is “0”, then enter “N/A” for A9.f.

58

Section B: 1-5

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1.a. NFIP Community Name:			B1.b. NFIP Community Identification Number:		
B2. County Name:		B3. State:	B4. Map/Panel No.:		B5. Suffix:

- Complete the Elevation Certificate using the Flood Insurance Study (FIS) and FIRM in effect at the time of the certification.
- For a building in an area that was mapped in one community but is now in another community due to annexation or dissolution, enter the community name and six-digit Community Identification Number of the community in which the building is now located

59

Section B: 1a-1b and 2

- B1.a: Enter the complete name of the community in which the building is located
  - For an unincorporated area of a county, enter the **county name and "unincorporated area"**
  - For a newly incorporated community, use the name and six-digit number of the new community.
- B1.b: Enter the associated six-digit Community Identification Number
- B2: Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter the county name. For an independent city, enter "independent city."

60

Section B: 4

- B4: 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 four-digit map number.
  - For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

61

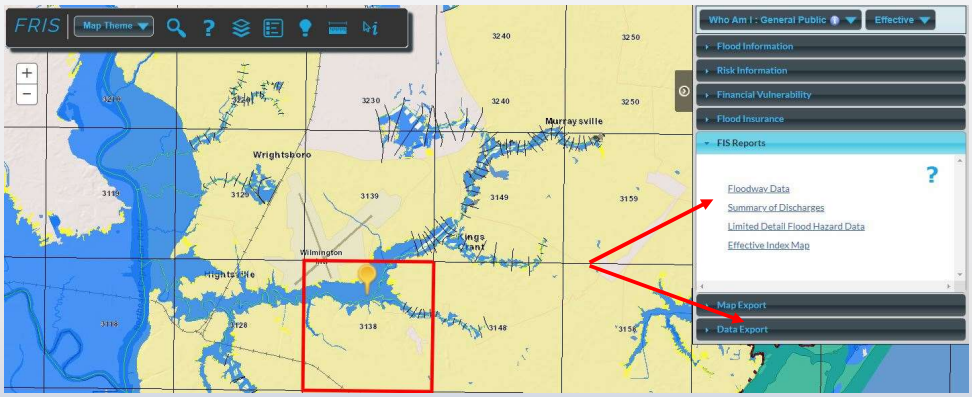
Section B: 6-7

B6. FIRM Index Date:		B7. FIRM Panel Effective/Revised Date:	

- B6: Enter the effective date or the map revised date shown on the FIRM Index.
- B7: Enter the effective date shown on the current FIRM panel.
  - If the area where the building is located was revised by a LOMR, include the LOMR effective date and the LOMR case number in the comments area of Section D.

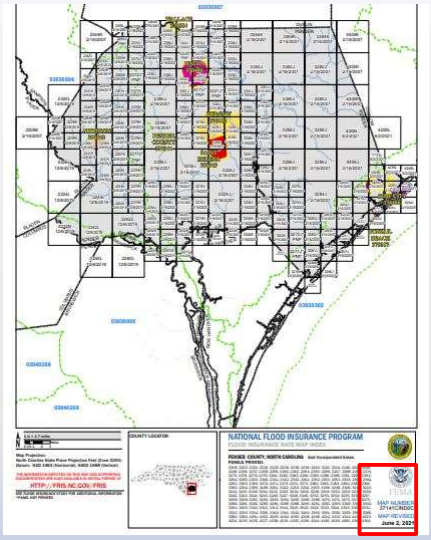
62

Section B: 6



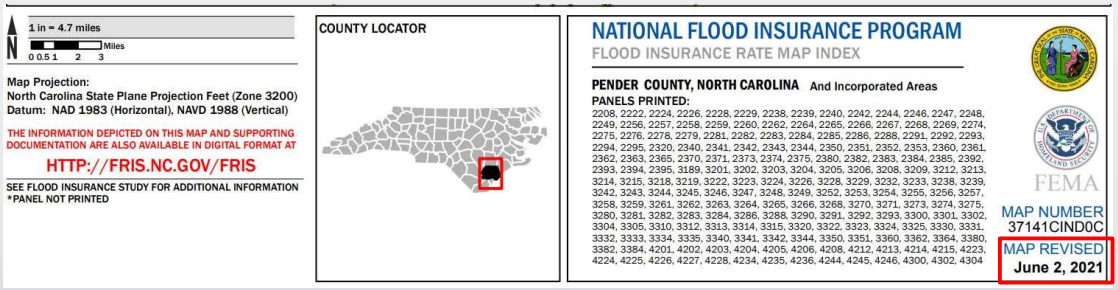
63

Section B: 6



64

Section B: 6



65

Section B: 8-11

B8. Flood Zone(s): B9. Base Flood Elevation(s) (BFE) (Zone AO, use Base Flood Depth):

B10. Indicate the source of the BFE data or Base Flood Depth entered in Item B9:
☐ FIS ☐ FIRM ☐ Community Determined ☐ Other:

B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source:

- B8: Enter the flood zone, or flood zones, in which the building is located.
- B9: Enter the BFE (or base flood depth) of the building site to the **nearest tenth of a foot** (nearest tenth of a meter, in Puerto Rico).
  - If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9.
- B10: Indicate the source of the BFE or base flood depth that you entered in Item B9.
- B11: Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend.

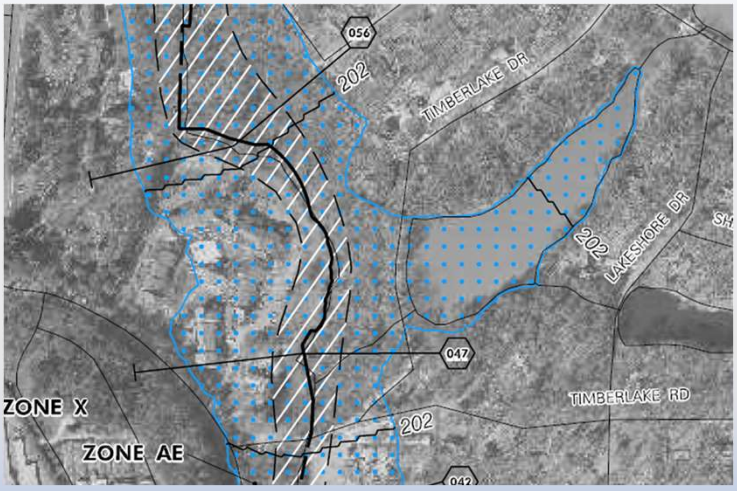
66

Determining the Base Flood Elevation (B9)

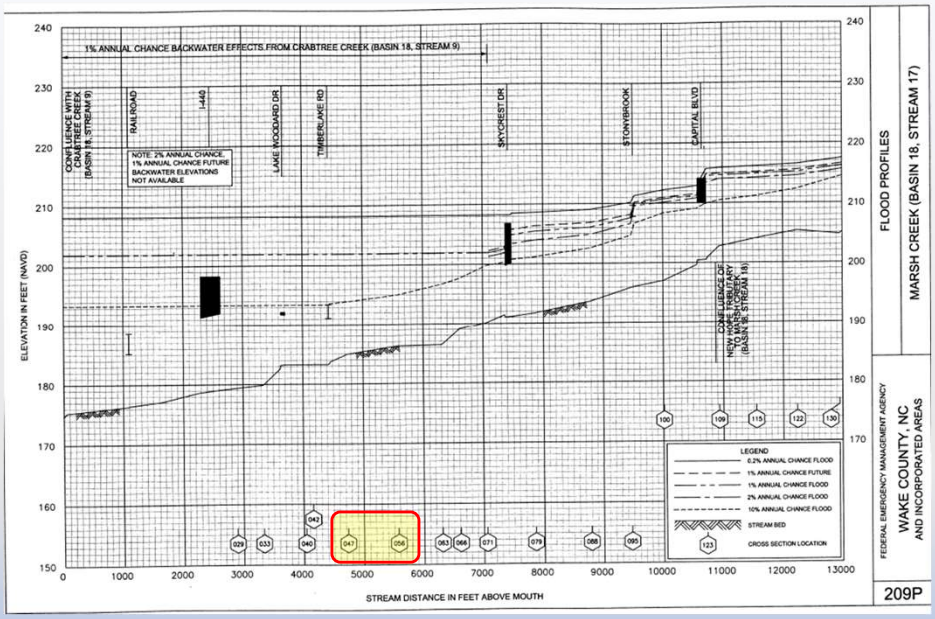
- Do **NOT** include freeboard.
- FRIS is your best source in North Carolina (WSEL rasters).
- Use Profiles and Tables in the FIS
- FIRM can be used on coastal or lacustrine areas with whole-foot BFEs.
  - Confirm the stillwater elevation in the FIS, which may be up to 0.5' higher.
- AO Zones indicate DEPTH, not BFE.
- In Zone X, BFE = N/A

67

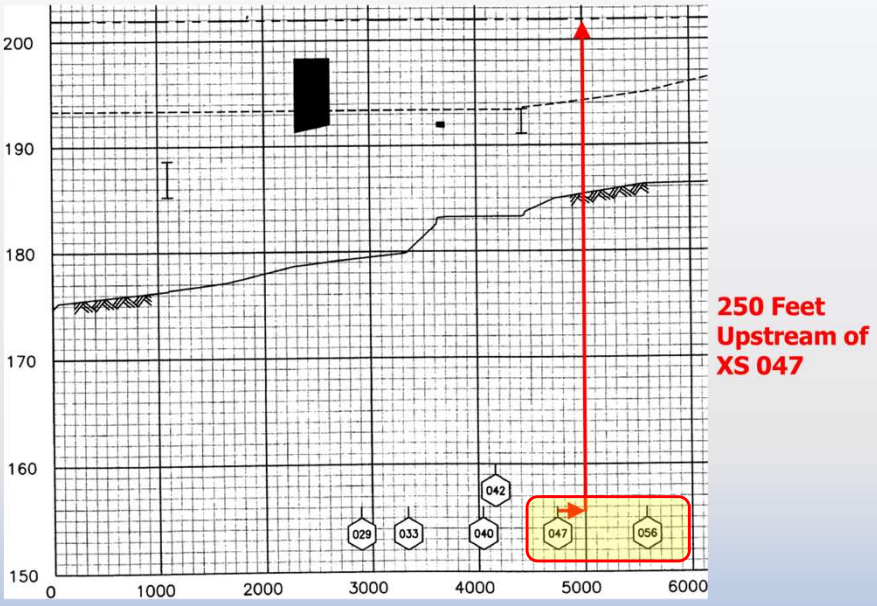
BFE in Backwater Area



68


1% ANNUAL CHANCE BACKWATER EFFECTS FROM CRABTREE CREEK (BASIN 18, STREAM 9)
CONFLUENCE WITH CRABTREE CREEK (BASIN 18, STREAM 9)
RAILROAD
I-440
LAKE WOODARD DR
TIMBERLAKE RD
SKYCREST DR
STONYBROOK
CAPITAL BLVD
NOTE: 2% ANNUAL CHANCE, 1% ANNUAL CHANCE FUTURE BACKWATER ELEVATIONS NOT AVAILABLE
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE MOUTH
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FUTURE
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
MARSH CREEK (BASIN 18, STREAM 17)
FEDERAL EMERGENCY MANAGEMENT AGENCY
WAKE COUNTY, NC
AND INCORPORATED AREAS
209P

69


ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE MOUTH
250 Feet Upstream of XS 047

70

Section B: 12-13

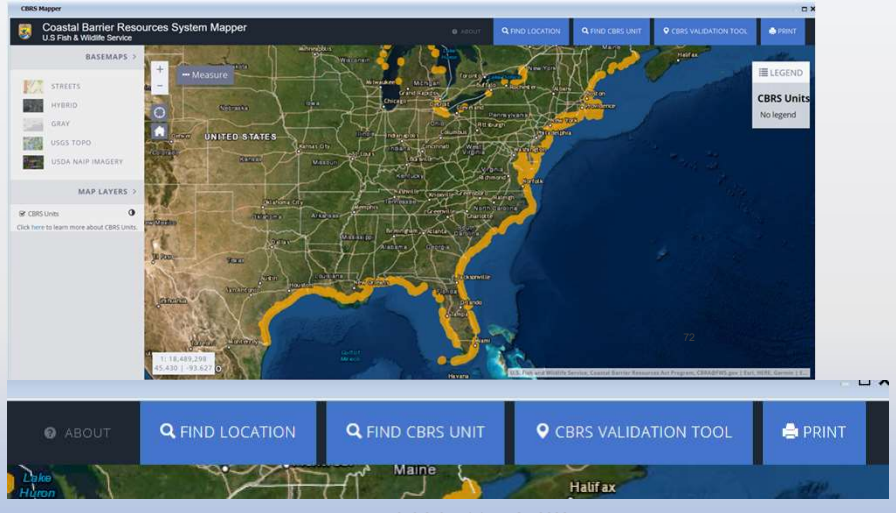
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No
Designation Date: ☐ CBRS ☐ OPA

B13. Is the building located seaward of the Limit of Moderate Wave Action (LiMWA)? ☐ Yes ☐ No

- B12: Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA).
  - CBRS areas and OPAs are no longer shown on the FIRM
- B13: Indicate whether the building is located seaward of the Limit of Moderate Wave Action (LiMWA).
  - If the LiMWA is not shown on the FIRM, check the "No" box.

71

Coastal Barrier Resource System Mapper



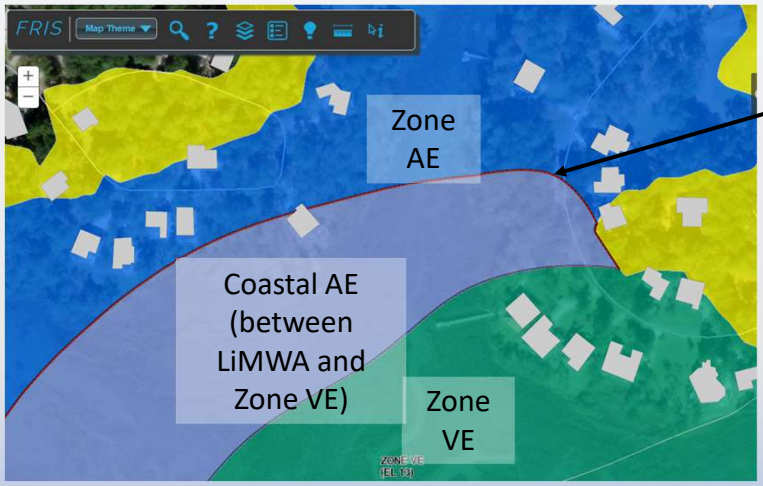
72

Coastal Barrier Resource System Mapper

- https://fwsprimary.wim.usgs.gov/CBRSMapper-v2/
- USFWS will continue to offer CBRS property determination letters for properties within the CBRS Buffer Zone
- The property validation tool is now a feature in the map viewer
- CBRS and OPA Units can also be displayed in FRIS
  - Must be selected in the Layers list

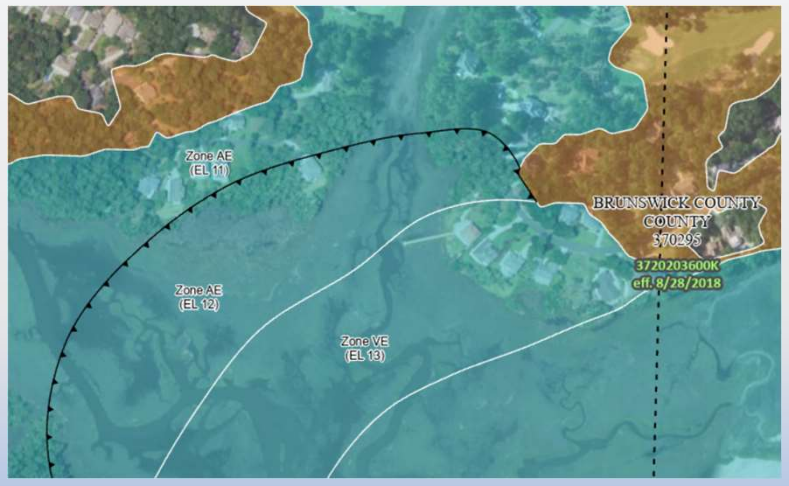
73

Limit of Moderate Wave Action (LiMWA) –



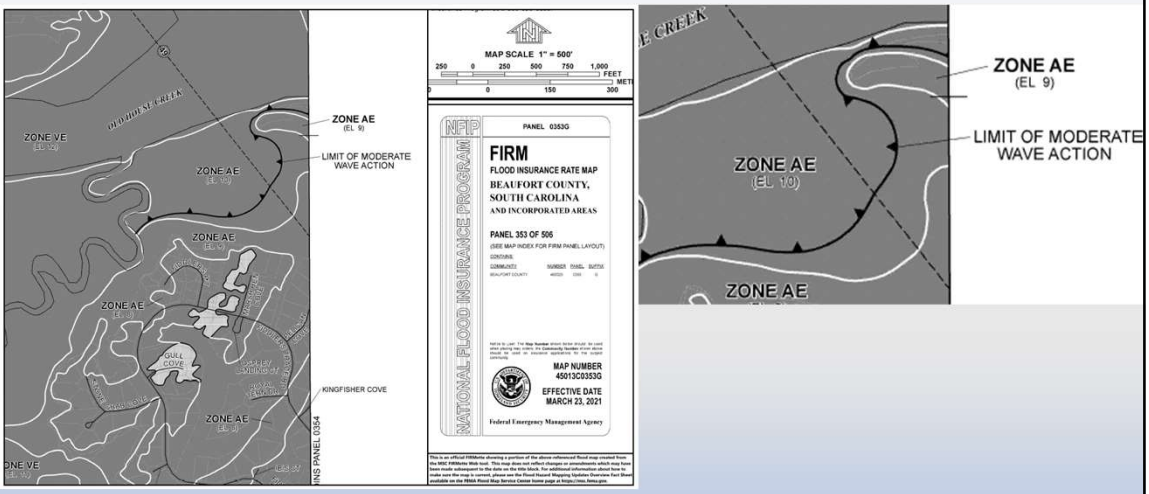
74

Limit of Moderate Wave Action (LiMWA



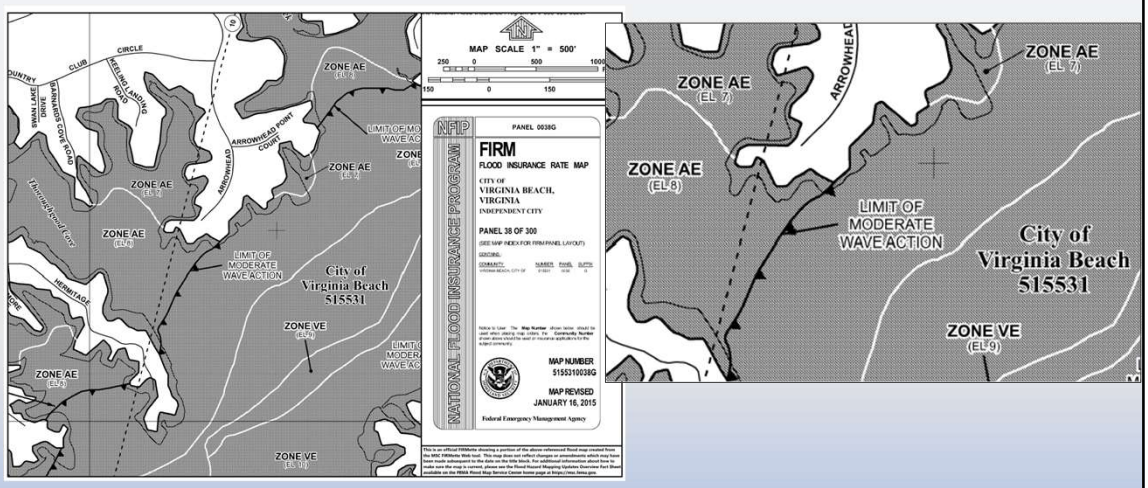
75

Limit of Moderate Wave Action (LiMWA) – SC



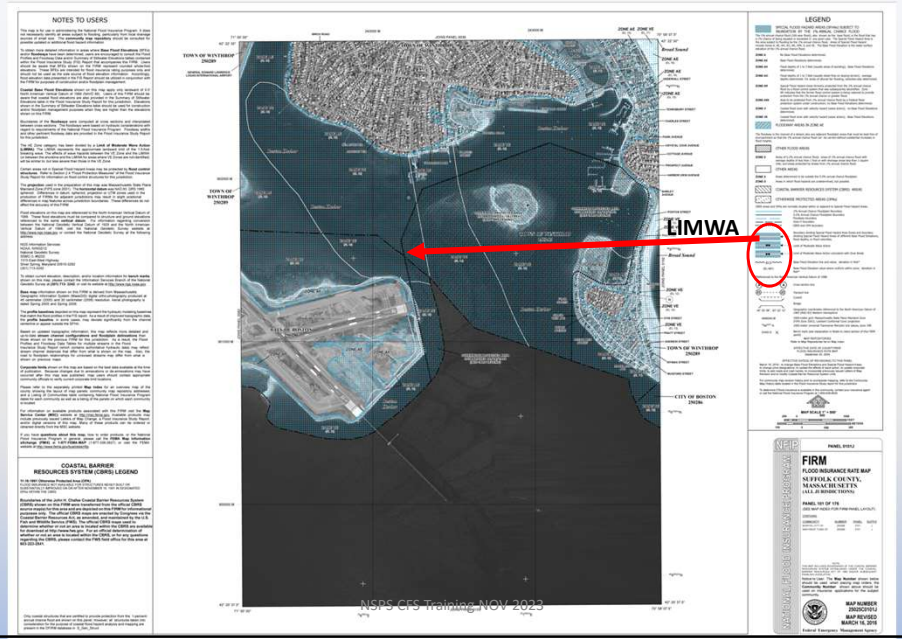
76

Limit of Moderate Wave Action (LiMWA) – VA



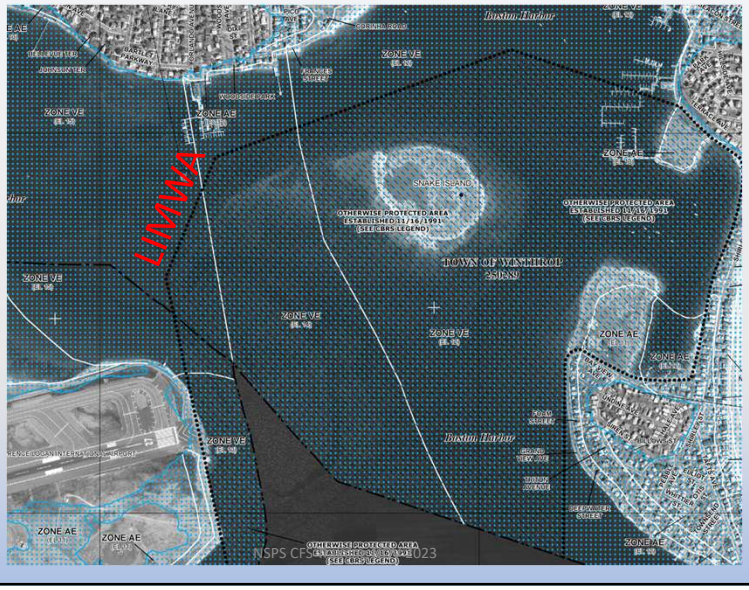
77

Limit of Moderate Wave Action (LIMWA) - MA



78

LIMWA – LOGAN INTERNATIONAL AIRPORT



79

EC can be completed in three ways

- Sections C and D
  - SFHA Zone with BFE determined
  - Requires field survey
- Sections E and F
  - SFHA Zone without BFE determined
  - Requires measurements
- Sections H and I
  - Insurance purposes only
  - Requires measurements

80

Section C: 1

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.

- 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 two 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 M&E such as furnaces, water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

81

Section C: 2

C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. 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:

Datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☐ No
If Yes, describe the source of the conversion factor in the Section D Comments area.

		Check the measurement used:
a) Top of bottom floor (including basement, crawlspace, or enclosure floor):		☐ feet ☐ meters
b) Top of the next higher floor (see Instructions):		☐ feet ☐ meters
c) Bottom of the lowest horizontal structural member (see Instructions):		☐ feet ☐ meters
d) Attached garage (top of slab):		☐ feet ☐ meters
e) Lowest elevation of Machinery and Equipment (M&E) servicing the building (describe type of M&E and location in Section D Comments area):		☐ feet ☐ meters
f) Lowest Adjacent Grade (LAG) next to building: ☐ Natural ☐ Finished		☐ feet ☐ meters
g) Highest Adjacent Grade (HAG) next to building: ☐ Natural ☐ Finished		☐ feet ☐ meters
h) Finished LAG at lowest elevation of attached deck or stairs, including structural support:		☐ feet ☐ meters

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Benchmarks

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 Benchmark elevation, description, & location information, go to:
- NC Geodetic Survey website: www.ncgs.state.nc.us OR
- National Geodetic Survey website: www.ngs.noaa.gov

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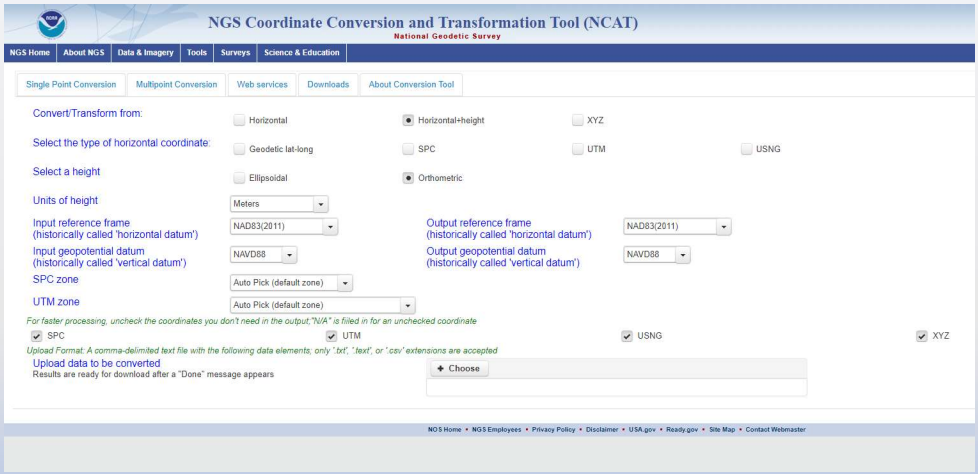
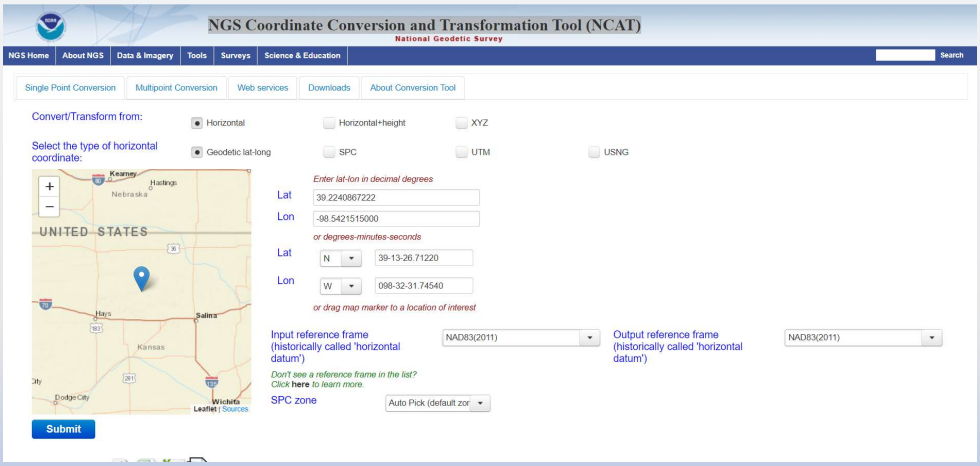
Datum Conversion: https://geodesy.noaa.gov/NCAT/



84

Datum Conversion: https://geodesy.noaa.gov/NCAT/



85

Section C: 2a-d

a) Top of bottom floor (including basement, crawlspace, or enclosure floor):		☐ feet	☐ meters
b) Top of the next higher floor (see Instructions):		☐ feet	☐ meters
c) Bottom of the lowest horizontal structural member (see Instructions):		☐ feet	☐ meters
d) Attached garage (top of slab):		☐ feet	☐ meters

- 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

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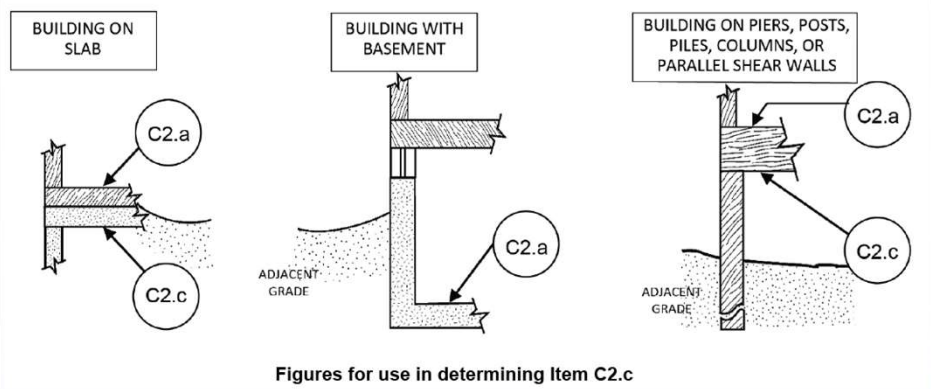
Section C: 2a-d



Figures for use in determining Item C2.c

87

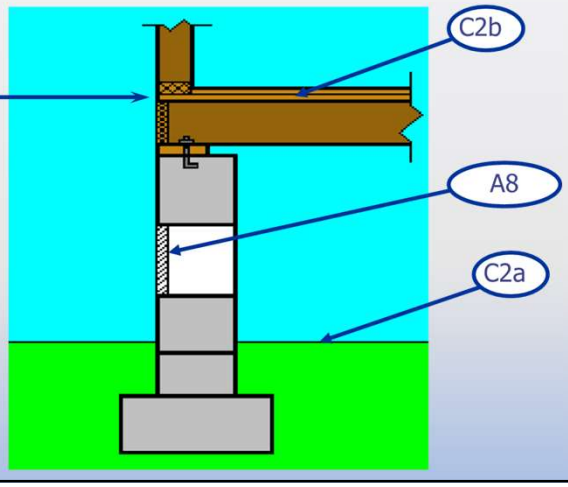
Section C: 2a-d

- For buildings in A or X zones, elevations should be measured at the top of the floor (Items C2.a and C2.b)
- 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).
- For buildings in V and Coastal A zones, enter the elevation measured at the bottom of the lowest horizontal structural member of the floor.

88

Lowest Floor in Zones A, AE, AH, AO, and X

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

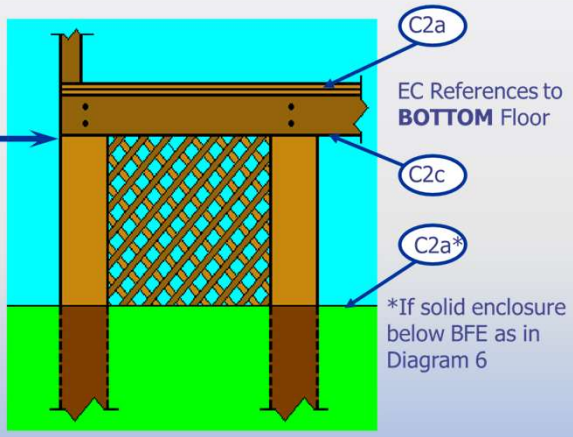


89

89

Lowest Floor in Zones V, VE, and Coastal A

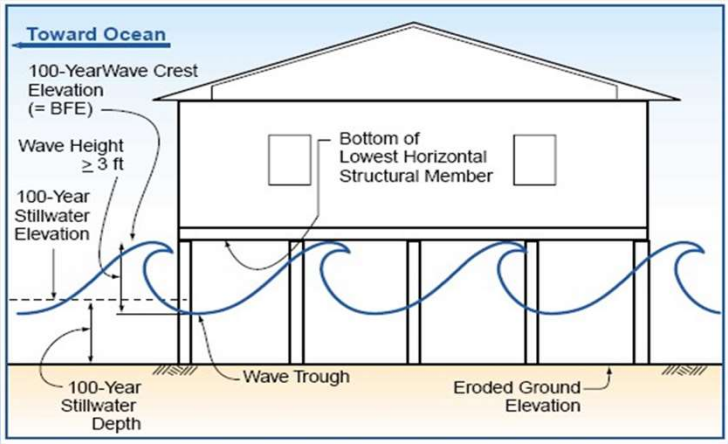
Bottom of the lowest horizontal structural member supporting the lowest floor



90

90

Coastal High Hazard Areas



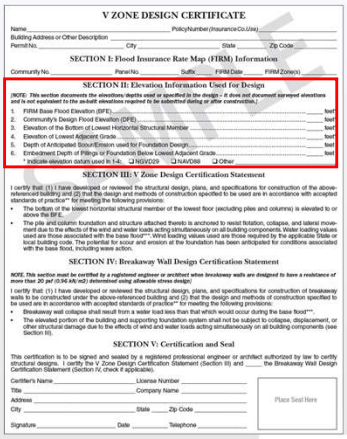
91

Coastal High Hazard Areas

- Fee of Obstruction
  - All new construction and substantial improvements shall have the space **below the lowest floor** free of obstructions or constructed with breakaway walls
- 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
  - Enclosed space shall not be used for human habitation and will be usable solely for parking of vehicles, building access, or storage.

92

V-Zone Design Certificate



V ZONE DESIGN CERTIFICATE

Name _____ Policy Number (Insurance Co.Use) _____

Building Address or Other Description _____

Permit No. _____ City _____ State _____ Zip Code _____

SECTION I: Flood Insurance Rate Map (FIRM) Information

Community No. _____ Panel No. _____ Suffix _____ FIRM Date _____ FIRM Zone(s) _____

SECTION II: Elevation Information Used for Design

[NOTE: This section documents the elevations/depths used or specified in the design – it does not document surveyed elevations and is not equivalent to the as-built elevations required to be submitted during or after construction.]

1. FIRM Base Flood Elevation (BFE) _____ feet*
2. Community's Design Flood Elevation (DFE) _____ feet*
3. Elevation of the Bottom of Lowest Horizontal Structural Member _____ feet*
4. Elevation of Lowest Adjacent Grade _____ feet*
5. Depth of Anticipated Scour/Erosion used for Foundation Design _____ feet
6. Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade _____ feet

* Indicate elevation datum used in 1-4: ❑ NGVD29 ❑ NAVD88 ❑ Other _____

SECTION III: V Zone Design Certification Statement

I certify that: (1) I have developed or reviewed the structural design, plans, and specifications for construction of the above-referenced building and (2) that the design and methods of construction specified to be used are in accordance with accepted standards of practice** for meeting the following provisions:

- The bottom of the lowest horizontal structural member of the lowest floor (excluding piles and columns) is elevated to or above the BFE.
- The pile and column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of the wind and water loads acting simultaneously on all building components. Water loading values used are those associated with the base flood***. Wind loading values used are those required by the applicable State or local building code. The potential for scour and erosion at the foundation has been anticipated for conditions associated with the base flood, including wave action.

SECTION IV: Breakaway Wall Design Certification Statement

NOTE: This section must be certified by a registered engineer or architect when breakaway walls are designed to have a resistance of more than 20 psf (0.94 kN/m2) determined using allowable stress design)

I certify that: (1) I have developed or reviewed the structural design, plans, and specifications for construction of breakaway walls to be constructed under the above-referenced building and (2) that the design and methods of construction specified to be used are in accordance with accepted standards of practice** for meeting the following provisions:

- Breakaway wall collapse shall result from a water load less than that which would occur during the base flood***.
- The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (see Section III).

SECTION V: Certification and Seal

This certification is to be signed and sealed by a registered professional engineer or architect authorized by law to certify structural designs. I certify the V Zone Design Certification Statement (Section III) and _____ the Breakaway Wall Design Certification Statement (Section IV, check if applicable).

Certifier's Name _____ License Number _____

Title _____ Company Name _____

Address _____

City _____ State _____ Zip Code _____

Signature _____ Date _____ Telephone _____

Place Seal Here

SECTION II: Elevation Information Used for Design

[NOTE: This section documents the elevations/depths used or specified in the design – it does not document surveyed elevations and is not equivalent to the as-built elevations required to be submitted during or after construction.]

1. FIRM Base Flood Elevation (BFE) _____ feet*
2. Community's Design Flood Elevation (DFE) _____ feet*
3. Elevation of the Bottom of Lowest Horizontal Structural Member _____ feet*
4. Elevation of Lowest Adjacent Grade _____ feet*
5. Depth of Anticipated Scour/Erosion used for Foundation Design _____ feet
6. Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade _____ feet

* Indicate elevation datum used in 1-4: ❑ NGVD29 ❑ NAVD88 ❑ Other _____

93

Breakaway Walls

94

Breakaway Walls

95

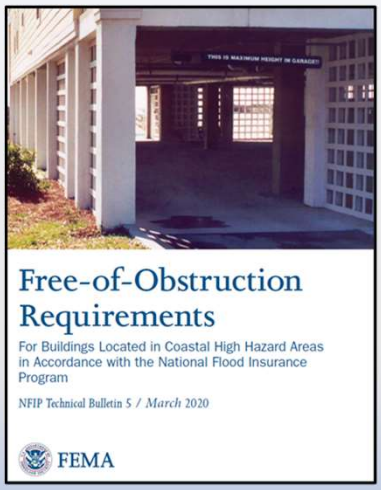
95

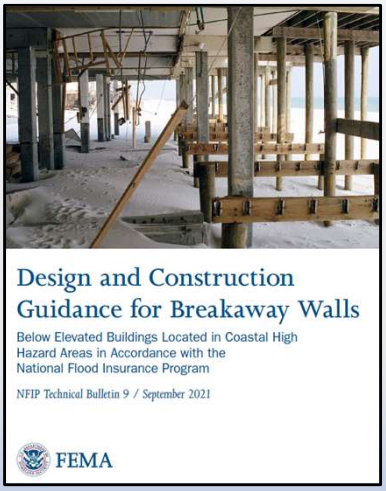
Breakaway Walls

96

96

Technical Bulletins





97

97

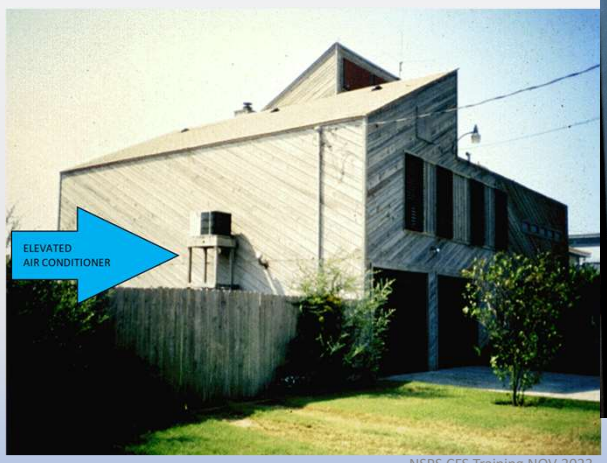
Section C: 2e

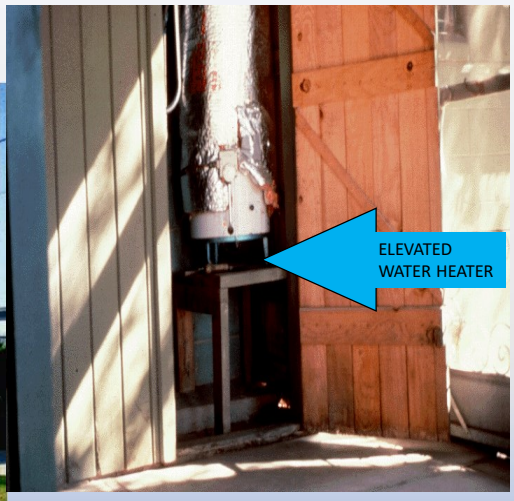
e) Lowest elevation of Machinery and Equipment (M&E) servicing the building (describe type of M&E and location in Section D Comments area): ☐ feet ☐ meters

- Enter the lowest platform, floor, or ground elevation supporting the lowest electrical, heating, ventilation, plumbing, and air conditioning M&E and other utilities servicing the building, which may be located in an attached garage or enclosure or on an open utility platform.
  - Note that elevations for the M&E items are required regardless of their location.
- Indicate the lowest M&E type and its general location (e.g., on floor inside garage, on platform affixed to exterior wall) in the Comments area of Section D or Section G, as appropriate.

98

Section C: 2e





99

Section C: 2e

- Compliant: elevated equipment and ducts; anchored tank

100

101

Section C: 2f-h

f) Lowest adjacent (finished) grade next to building (LAG)		☐ feet	☐ meters
g) Highest adjacent (finished) grade next to building (HAG)		☐ feet	☐ meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support		☐ feet	☐ meters

- C2.f: Enter the finished Lowest Adjacent Grade (LAG) elevation of the ground, sidewalk, or patio slab next to and in direct contact with the building.
- C2.g: Enter the finished Highest Adjacent Grade (HAG) elevation of the ground, sidewalk, or patio slab next to and in direct contact with the building.
- C2.h: Enter the finished LAG elevation of the lowest ground, sidewalk, or patio slab next to and in direct contact with the structurally-attached-deck supports or stairs structurally attached to the building.
- For buildings under construction in any flood zone, enter the lowest LAG and HAG at the time of the survey.

102

Section D

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by state 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 and describe in the Comments area.

Certifier's Name: License Number:

Title:

Company Name:

Address:

City: State: ZIP Code:

Signature: Date:

Telephone: Ext.: Email:

Place Seal Here

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

Comments (including source of conversion factor in C2; type of equipment and location per C2.e; and description of any attachments):

103

Who can certify elevations in Section C?

☒ Construction Drawings* = Architect, Engineer, Surveyor

☒ Building Under Construction* = Many states - only a licensed Surveyor

☒ Finished Construction = Many states - only a licensed Surveyor

104

Section D

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

Comments (including source of conversion factor in C2; type of equipment and location per C2.e; and description of any attachments):

- Use the Comments area to provide additional information, as appropriate.
- Include notes about the lowest machinery or equipment, and other features of the structure as needed.

105

Section E

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

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED)
FOR ZONE AO, ZONE AR/AO, AND ZONE A (WITHOUT BFE)

For Zones AO, AR/AO, and A (without BFE), complete Items E1–E5. For Items E1–E4, use natural grade, if available. If the Certificate is intended to support a Letter of Map Change request, complete Sections A, B, and C. Check the measurement used. In Puerto Rico only, enter meters.

Building measurements are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

E1. Provide measurements (C.2.a in applicable Building Diagram) for the following and check the appropriate boxes to show whether the measurement is above or below the natural HAG and the 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 (C2.b in applicable Building Diagram) 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.

106

Section F

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

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

☐ Check here if attachments and describe in the Comments area.

Property Owner or Owner's Authorized Representative Name:

Address:

City: State: ZIP Code:

Signature: Date:

Telephone: Ext.: Email:

Comments:

Complete as indicated. This section is provided for certification of measurements when completing Sections A, B, and E. The address entered in this section must be the actual mailing address of the individual who provided the information on the certificate. Check the box as indicated if including attachments and describe in the Comments area.

107

Section G: 1-8

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Section A, B, C, E, G, or H of this Elevation Certificate. Complete the applicable item(s) and sign below when:

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 state law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2.a. ☐ A local official completed Section E for a building located in Zone A (without a BFE), Zone AO, or Zone AR/AO, or when item E5 is completed for a building located in Zone AO.

G2.b. ☐ A local official completed Section H for insurance purposes.

G3. ☐ In the Comments area of Section G, the local official describes specific corrections to the information in Sections A, B, E and H.

G4. ☐ The following information (Items G5–G11) is provided for community floodplain management purposes.

G5. Permit Number: G6. Date Permit Issued:

G7. Date Certificate of Compliance/Occupancy Issued:

G8. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

108

Section G: 9-11

G9.a. Elevation of as-built lowest floor (including basement) of the building: ☐ feet ☐ meters Datum:

G9.b. Elevation of bottom of as-built lowest horizontal structural member: ☐ feet ☐ meters Datum:

G10.a. BFE (or depth in Zone AO) of flooding at the building site: ☐ feet ☐ meters Datum:

G10.b. Community's minimum elevation (or depth in Zone AO) requirement for the lowest floor or lowest horizontal structural member: ☐ feet ☐ meters Datum:

G11. Variance issued? ☐ Yes ☐ No If yes, attach documentation and describe in the Comments area.

The local official who provides information in Section G must sign here. *I have completed the information in Section G and certify that it is correct to the best of my knowledge. If applicable, I have also provided specific corrections in the Comments area of this section.*

Local Official's Name: Title:

NFIP Community Name:

Telephone: Ext.: Email:

Address:

City: State: ZIP Code:

Signature: Date:

Comments (including type of equipment and location, per C2.e; description of any attachments; and corrections to specific information in Sections A, B, D, E, or H):

109

Section H

SECTION H – BUILDING'S FIRST FLOOR HEIGHT INFORMATION FOR ALL ZONES (SURVEY NOT REQUIRED) (FOR INSURANCE PURPOSES ONLY)

The property owner, owner's authorized representative, or local floodplain management official may complete Section H for all flood zones to determine the building's first floor height for insurance purposes. Sections A, B, and I must also be completed. Enter heights to the nearest tenth of a foot (nearest tenth of a meter in Puerto Rico). ***Reference the Foundation Type Diagrams (at the end of Section H Instructions) and the appropriate Building Diagrams (at the end of Section I Instructions) to complete this section.***

H1. Provide the height of the top of the floor (as indicated in Foundation Type Diagrams) above the Lowest Adjacent Grade (LAG):

a) **For Building Diagrams 1A, 1B, 3, and 5–9.** Top of bottom floor (include above-grade floors only for buildings with subgrade crawlspaces or enclosure floors) is: ☐ feet ☐ meters ☐ above the LAG

b) **For Building Diagrams 2A, 2B, 4, and 6–9.** Top of next higher floor (i.e., the floor above basement, crawlspace, or enclosure floor) is: ☐ feet ☐ meters ☐ above the LAG

H2. Is **all** Machinery and Equipment servicing the building (as listed in Item H2 instructions) elevated to or above the floor indicated by the H2 arrow (shown in the Foundation Type Diagrams at end of Section H instructions) for the appropriate Building Diagram?
☐ Yes ☐ No

110

Foundation Type Diagrams (for use in Section H):

Slab on Grade (Non-Elevated)

Corresponds to EC Diagrams 1A, 1B and 3

Note: If the building has more than one floor, the Machinery and Equipment should be on the second floor or higher.

Elevated without Enclosure on Posts, Piles, or Piers

Corresponds to EC Diagram 5

Basement (Non-Elevated)

Corresponds to EC Diagrams 2A, 2B and 4

Elevated with Enclosure on Posts, Piles, or Piers

Corresponds to EC Diagram 6

Crawlspace (Elevated, including Non-Elevated Sub-Grade Crawlspace)

Corresponds to EC Diagrams 8 and 9

Elevated with Enclosure Not on Posts, Piles, or Piers (Solid Foundation Walls)

Corresponds to EC Diagram 7

111

Section I

SECTION I – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and H must sign here. *The statements in Sections A, B, and H are correct to the best of my knowledge.* **Note:** If the local floodplain management official completed Section H, they should indicate in Item G2.b and sign Section G.

☐ Check here if attachments are provided (including required photos) and describe each attachment in the Comments area.

Property Owner or Owner's Authorized Representative Name:

Address:

City: State: ZIP Code:

Signature: Date:

Telephone: Ext.: Email:

Comments:

112

Question 1

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

___ True

___ False

113

Answer 1

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

_X_ True

___ False

The Elevation Certificate was mainly used by the insurance company to rate the building for flood insurance. This has changed under Risk Rating 2.0

114

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

115

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 (PLS) for a Building Under Construction or Finished Construction.

116

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

117

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

118

Question 4

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

___ True

___ False

119

Answer 4

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

___ True

_X_ False

Enter “N/A”

120

Question 5

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

___ True

___ False

121

Answer 5

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

___ True

_X_ False

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

122

Question 6

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

___ True

___ False

123

Answer 6

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

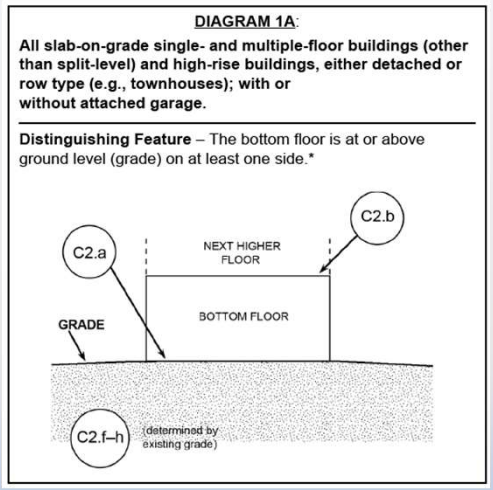
___ True

_X_ False

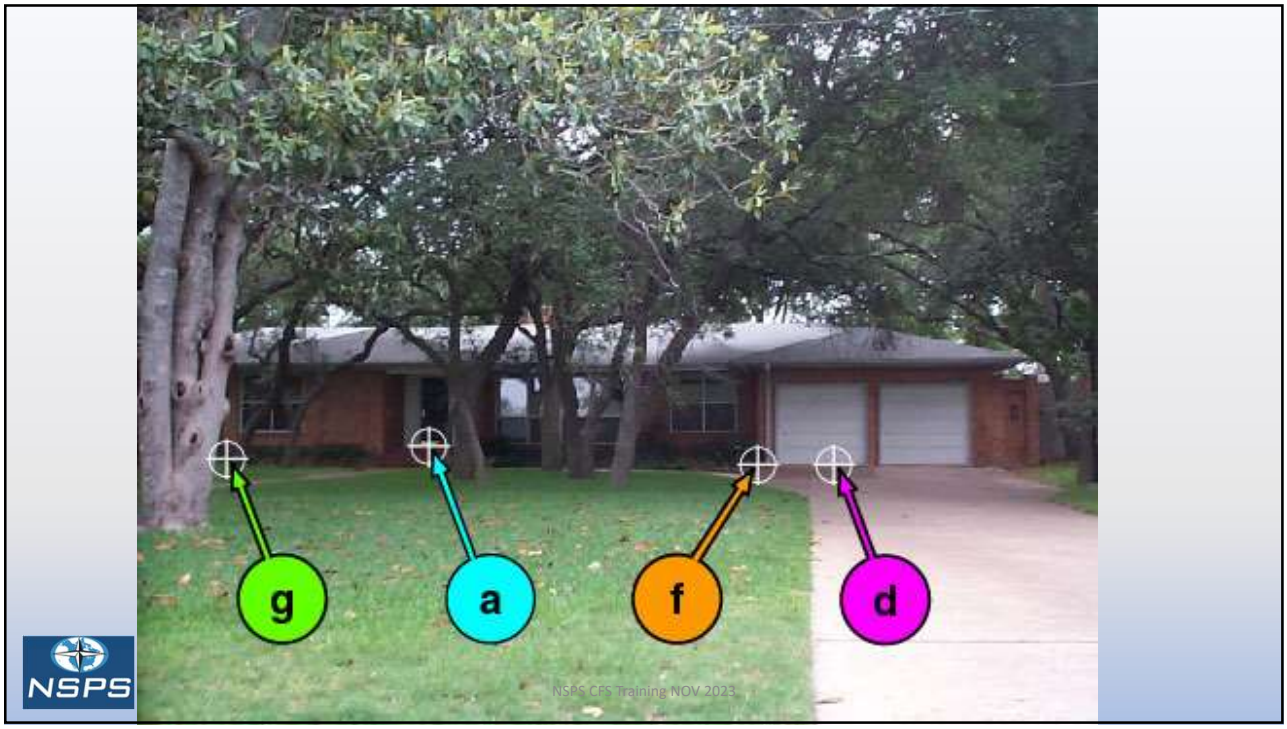
Enter “N/A.” Please use the Comments area!

124

Building Diagram 1A

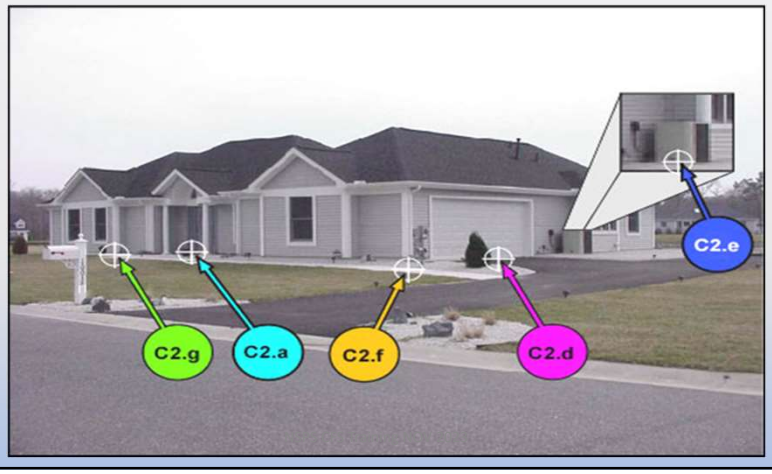


125



126

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



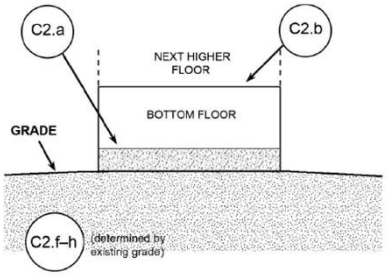
127

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.*



128

Slab on stem wall with fill

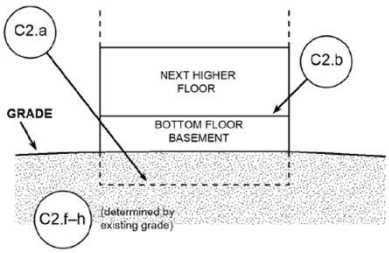
129

Building Diagram 2A

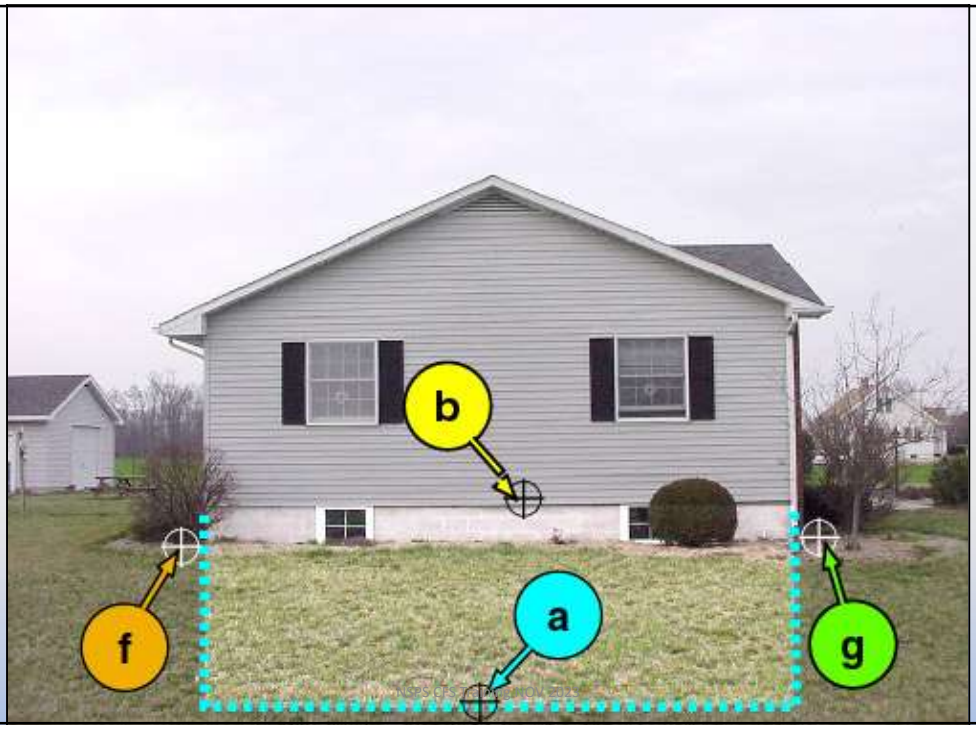
DIAGRAM 2A:

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.*



130



131

Which Diagram Do You Use?

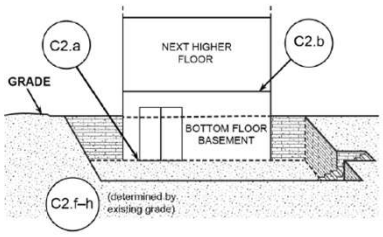
132

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 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.*



133

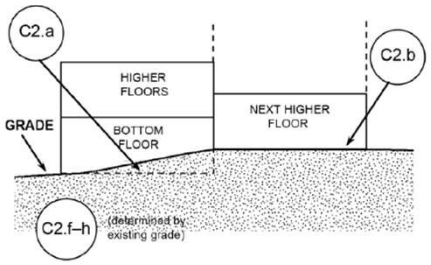
134

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.*



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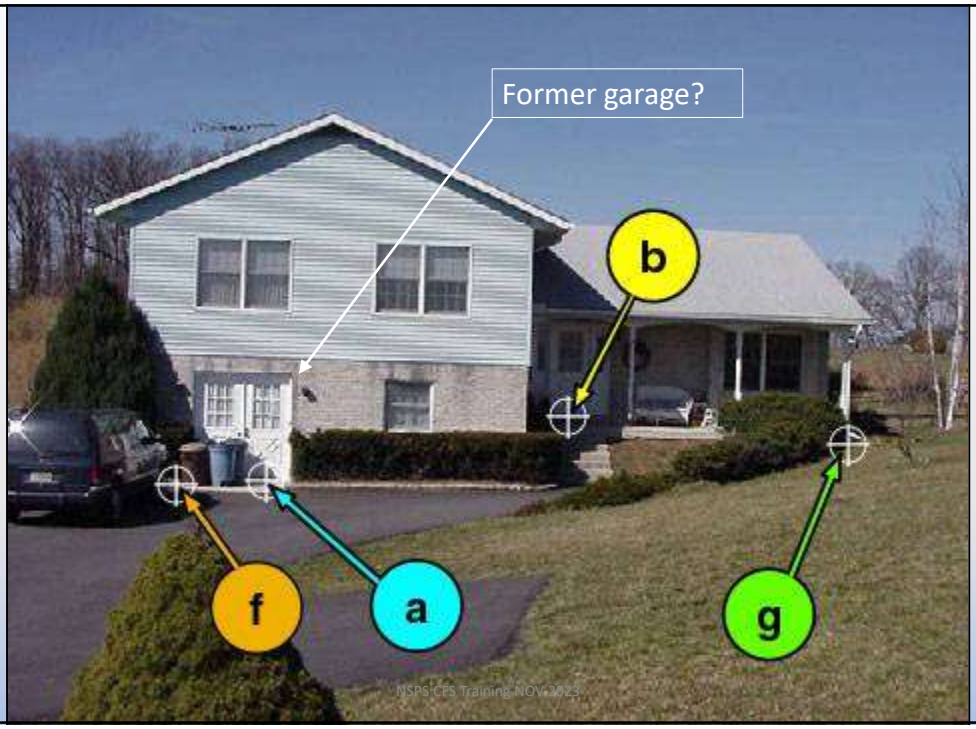
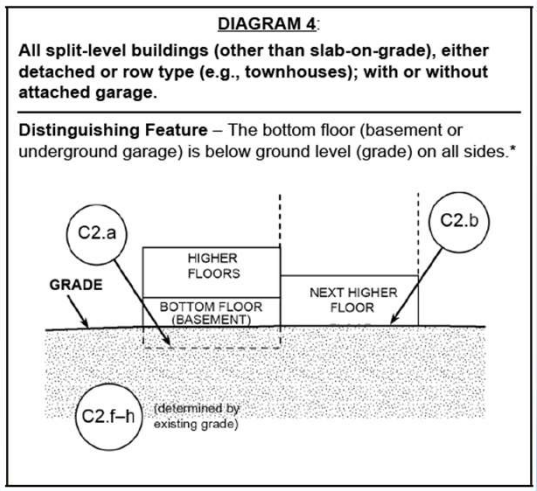
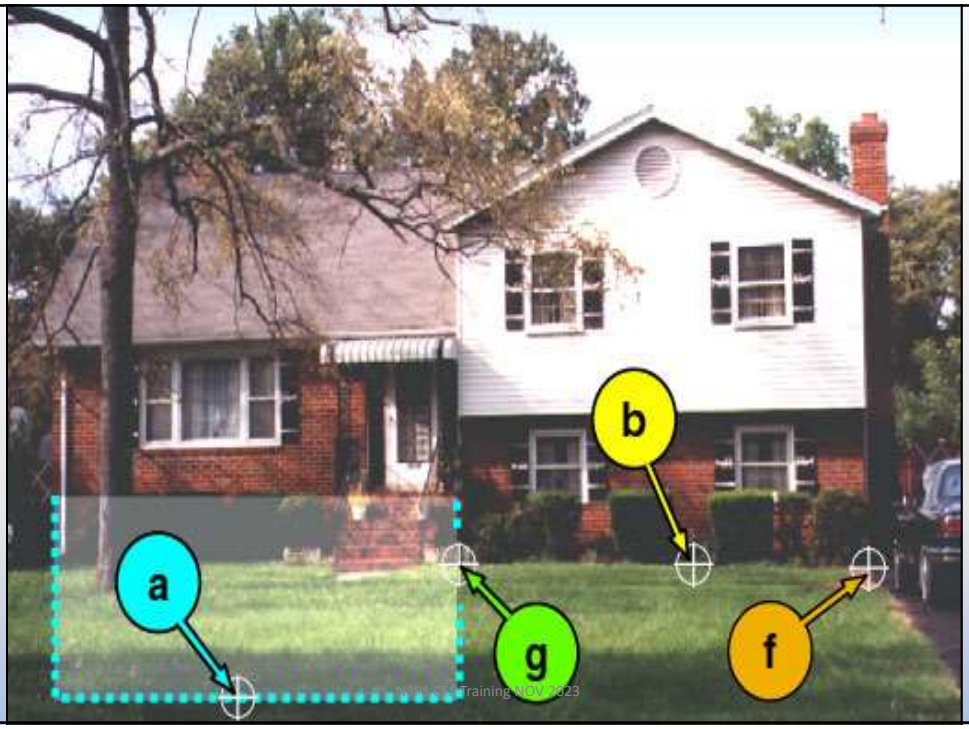


136

Building Diagram 4



137



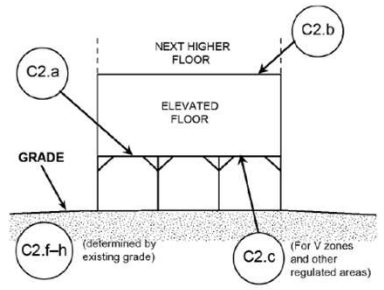
138

Building Diagram 5

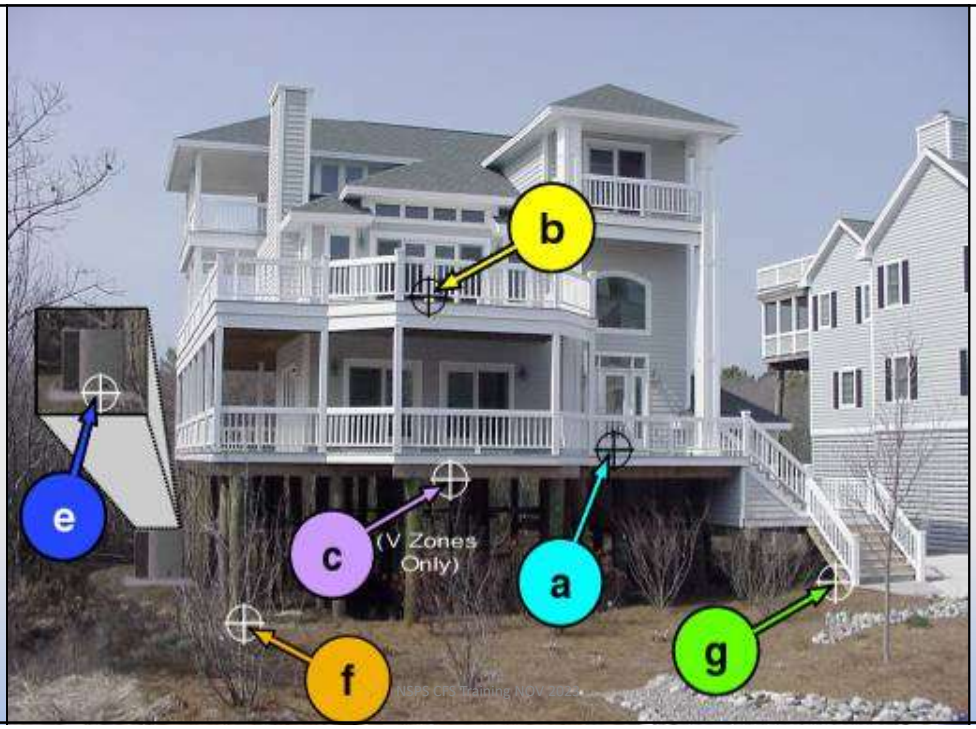
DIAGRAM 5:

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 floodwaters (open lattice work and/or insect screening is permissible).

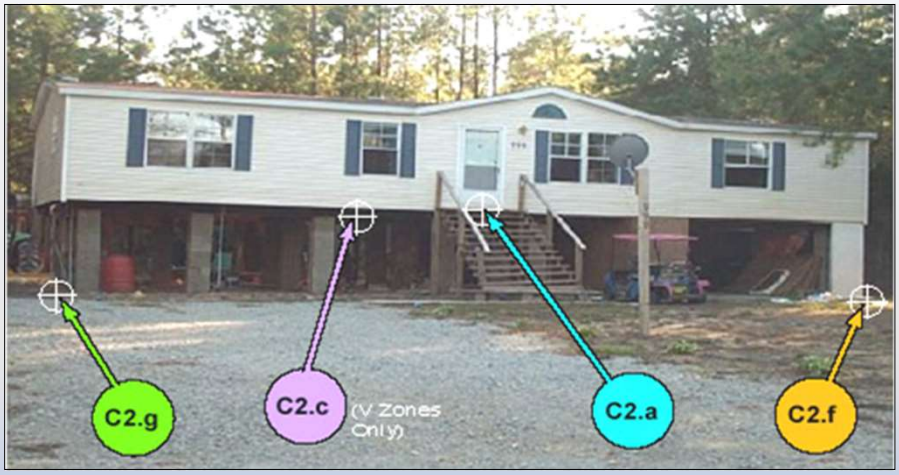


139



140

Manufactured home elevated on pier foundation



141

Which Diagram is it?

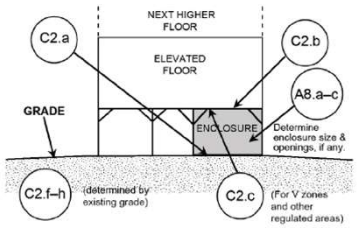
142

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.



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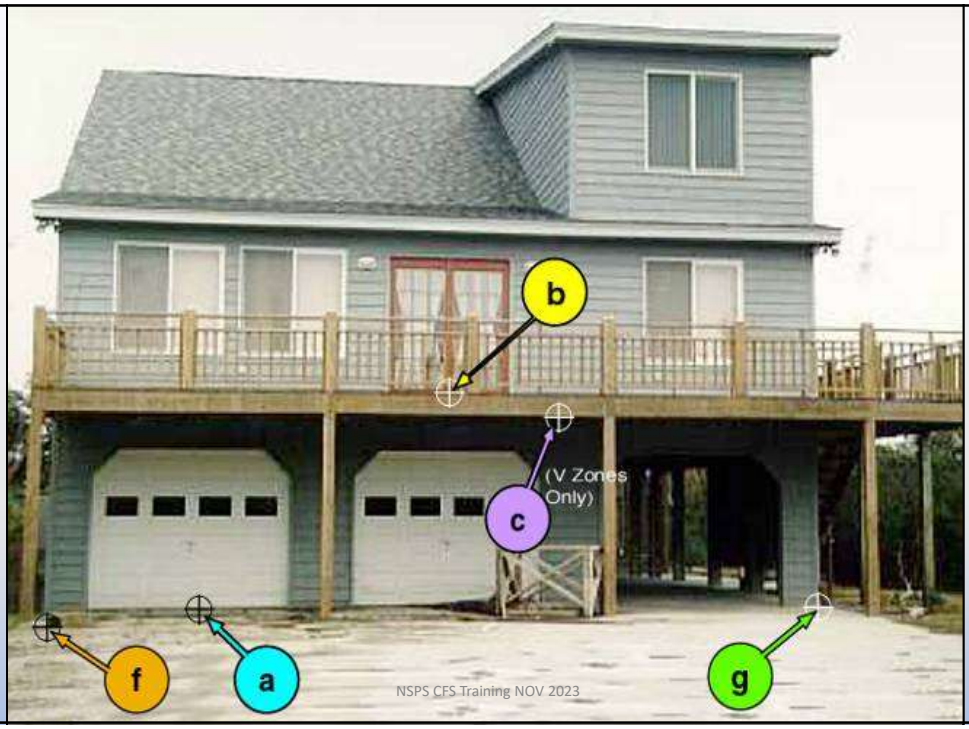
143

143



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144

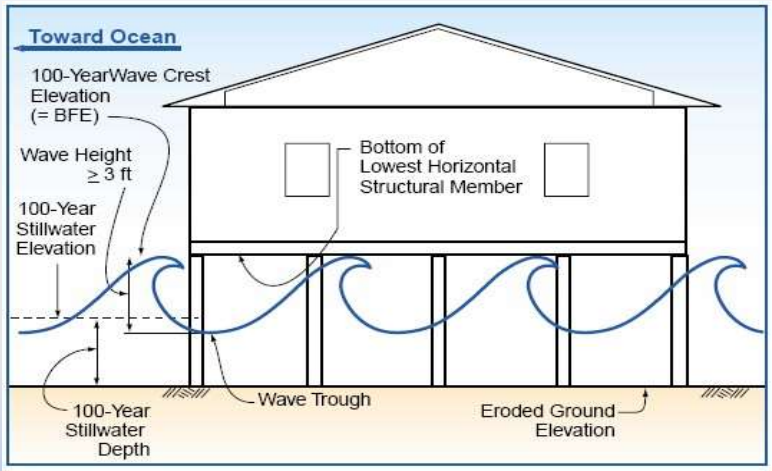
144

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

145

NFIP: V Zone Elevation



146

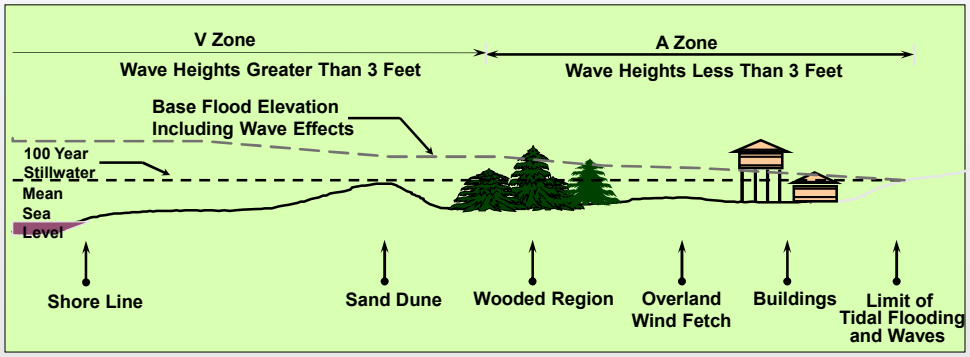
Free-of-Obstruction

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 building access, or storage.

147

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.

148

Breakaway Walls

149

150

151

Technical Bulletins

Free-of-Obstruction Requirements

For Buildings Located in Coastal High Hazard Areas in Accordance with the National Flood Insurance Program

NFIP Technical Bulletin 5 / March 2020

FEMA

Design and Construction Guidance for Breakaway Walls

Below Elevated Buildings Located in Coastal High Hazard Areas in Accordance with the National Flood Insurance Program

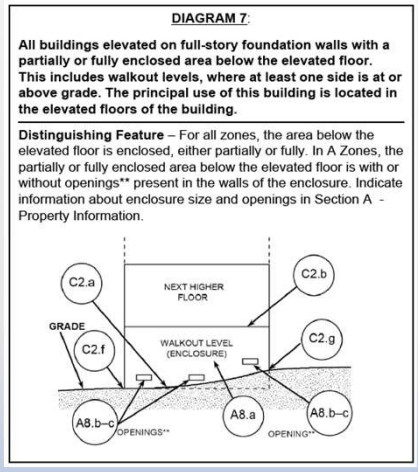
NFIP Technical Bulletin 9 / September 2021

FEMA

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

152

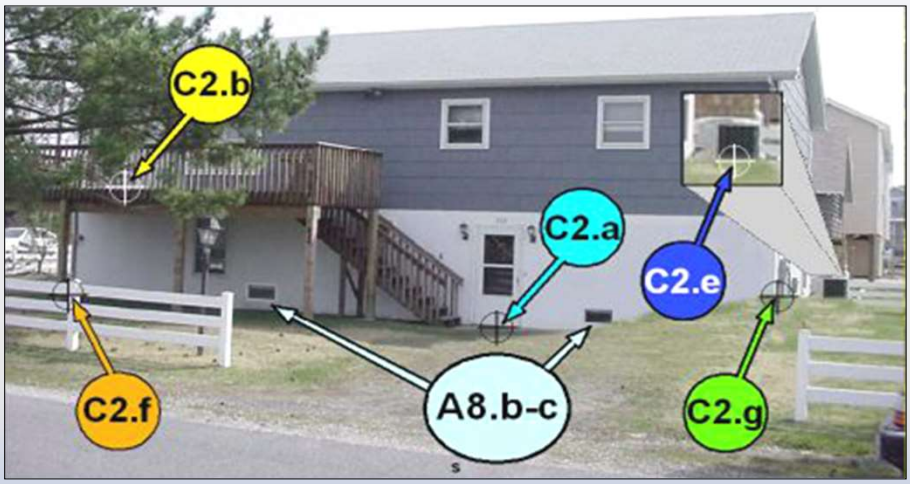
Building Diagram 7



153

Building elevated on full-story foundation walls

Fully enclosed area below the elevated floor



154

Building elevated on full-story foundation walls

Fully enclosed area below the elevated floor

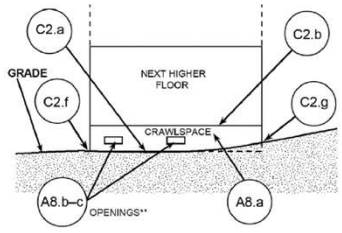
155

Building Diagram 8

DIAGRAM 8:

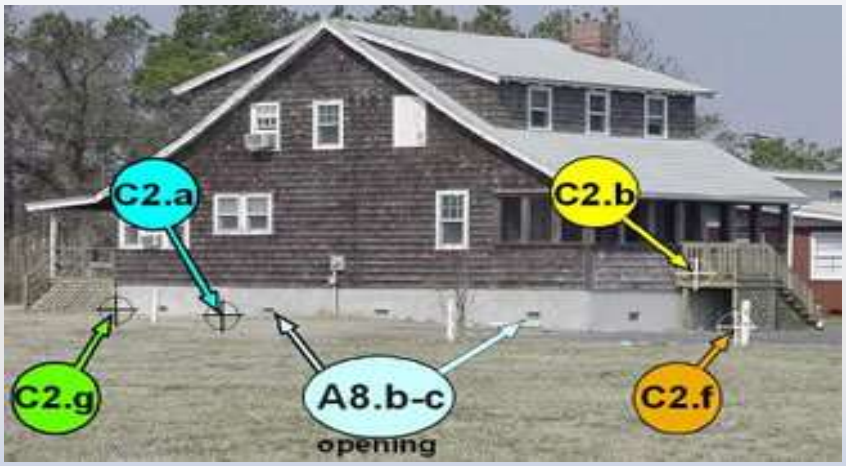
All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least one side, with or without an attached garage.

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. (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, use Diagram 7.)



156

Multi-level building elevated on crawl space



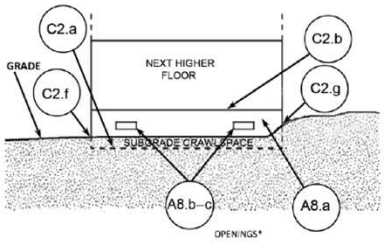
157

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 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 five feet, or the crawlspace floor is more than two feet below the grade [LAG] on all sides, use Diagram 2A or 2B.)



158

Section A7 – Diagram 9

- NFIP Insurance Manual & Elevation Certificate: 5’ maximum between floor and top of the next higher floor = Crawlspace
- Technical Bulletin 11: 4’ maximum between floor and bottom of next higher floor AND no more than 2’ below exterior grade = Crawlspace

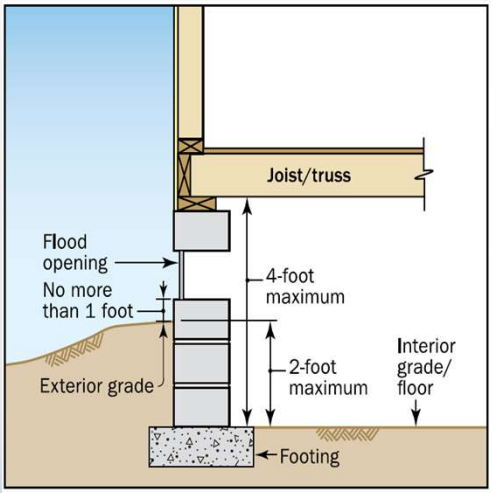


Figure 5: Limitations on below-grade crawlspaces in shallow flood hazard areas (see NFIP Technical Bulletin 11 for more information)

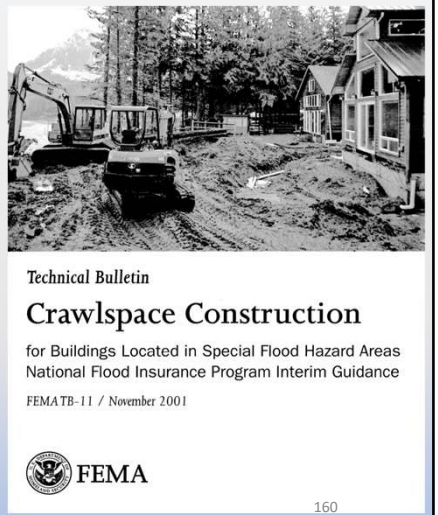
159

Section A7 – Diagram 9

Communities must amend their ordinance to include:

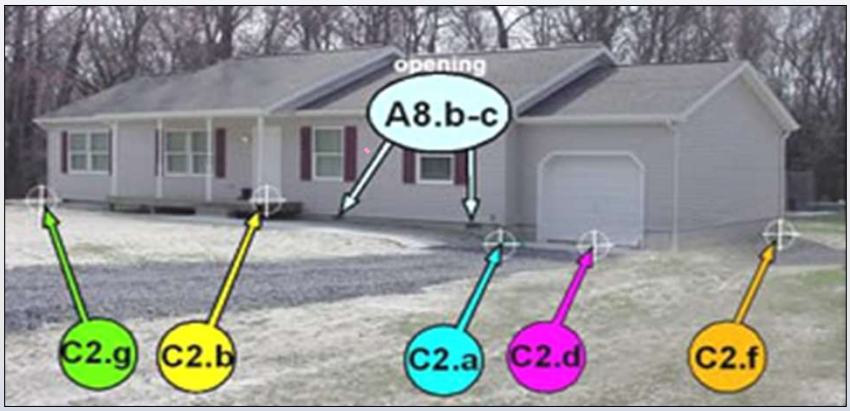
- Interior grade no more than 2’ below LAG
- Height to top of foundation wall not to exceed 4’
- Must be adequate drainage
- Velocities not to exceed 5 fps

Note: still considered a basement for insurance rating



160

One-story building on crawl space
Attached garage



161

Which Building Diagram?

162

Diagram 2B

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163

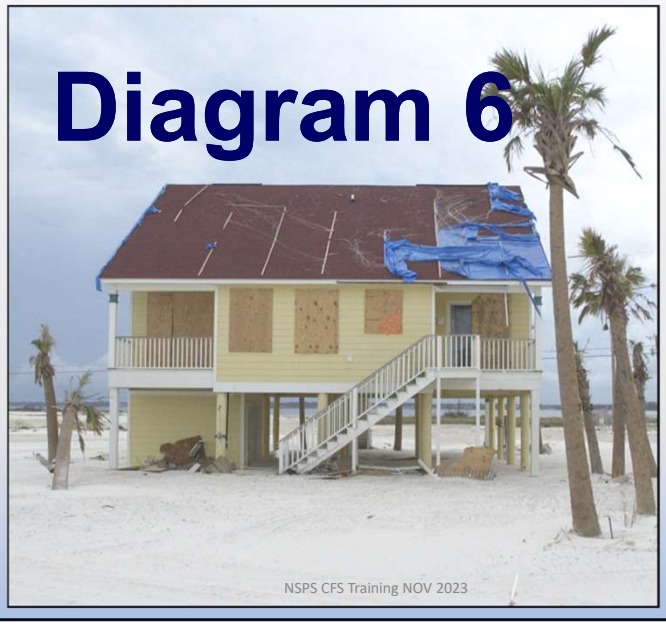

Diagram 6

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164

Diagram 2B

165

Diagram 7

166


167
Diagram 4 or 2
NSPS CFS Training NOV 2023

167


168
Diagram 3
NSPS CFS Training NOV 2023

168

Diagram 5

169

Diagram 5

Hanging Floor

170

Diagram 1A

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171

172

Diagram 1 or 6?

← Enclosure

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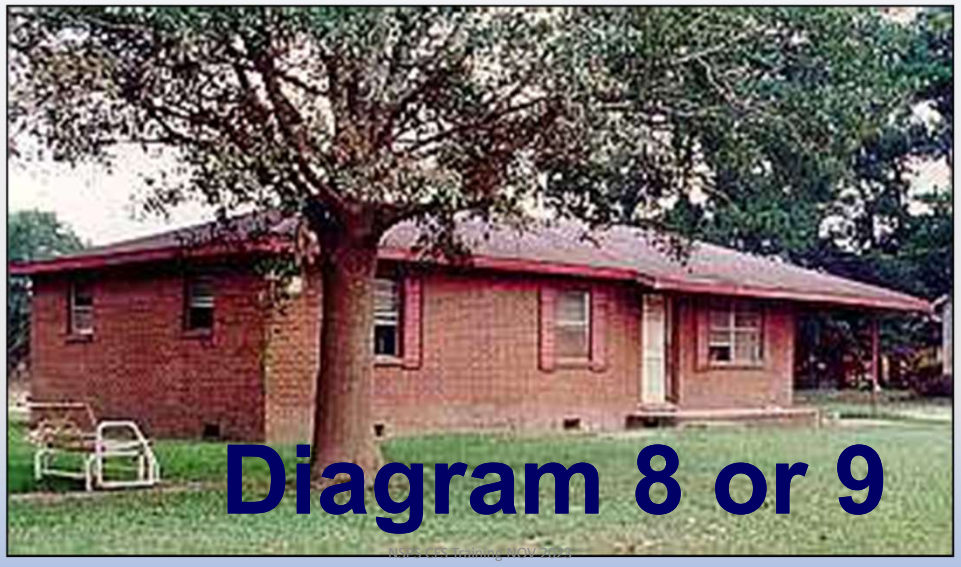
172

Diagram 5 or 6

173

Diagram 1B

174



175

176

177

178

Quiz

179

Certified Floodplain Surveyor (CFS) Quiz

Elevation Certificates

1. Which of the following is a characteristic of a basement?

   A. Below grade on all sides
   B. Below grade on three sides
   C. Below grade on two sides
   D. A and B

2. What is the definition of "enclosure?"

3. Are windows, doors, or garage doors acceptable for venting? If 'No', why?

4. What is the one item that MUST be included in the Comments under Section D?

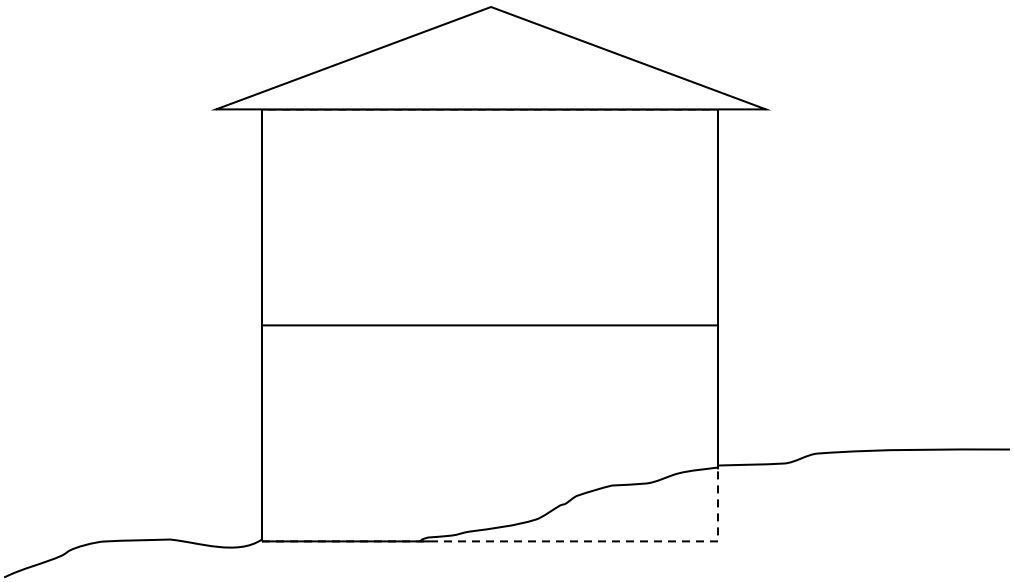
5. What is the purpose of the Lowest Adjacent Grade elevation for a structure?

6. True/False: A lake level monitored by USGS can be used as a vertical benchmark.

7. For a structure in Zone X, what would be the BFE in B9?

   A. 0 (zero)
   B. The nearest BFE
   C: The nearest RFPE
   D. N/A

8. Label the Lowest Adjacent Grade (LAG), Top of Bottom floor, Top of next highest floor and the Highest Adjacent Grade (HAG) on the diagram below.



NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 5

Using a FIRM and its Components

October 31 - November 3, 2023

1

This Module Will . . .

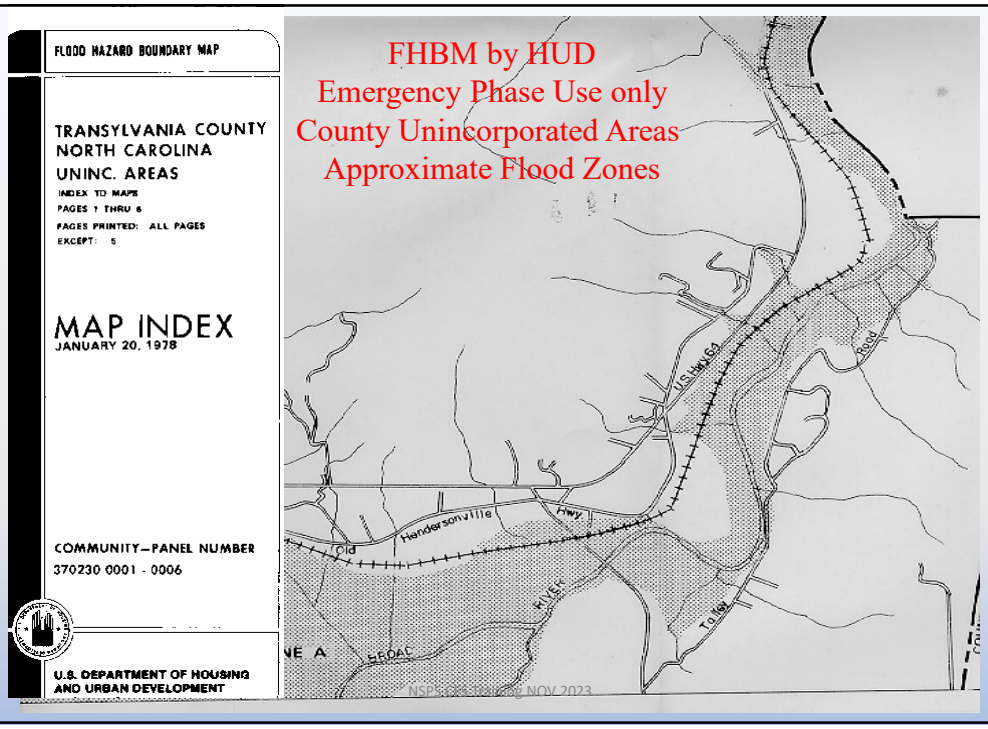
- Describe the different types of FEMA flood maps
- Teach you how to determine BFE using:
  - A Flood Profile
  - A Floodway Data Table
  - An interpolation method (for Limited Detailed Study cases)
  - TNFMP Rasters

2

Types of FEMA Flood Maps

- Flood Hazard Boundary Map (FHBM)
  - Delineates SFHAs as Zone A and is usually only used in the Emergency Phase of the NFIP.
- Flood Boundary and Floodway Map (FBFM)
  - Regular Phase use - supplemental to the FIRM - shows Floodway data.
- Flood Insurance Rate Map (FIRM)
  - Regular Phase use - shows floodplains, BFEs where available, profile data, etc. - NOTE: Newer FIRMs are combining all data into one map and some are even going County- or Statewide.

3



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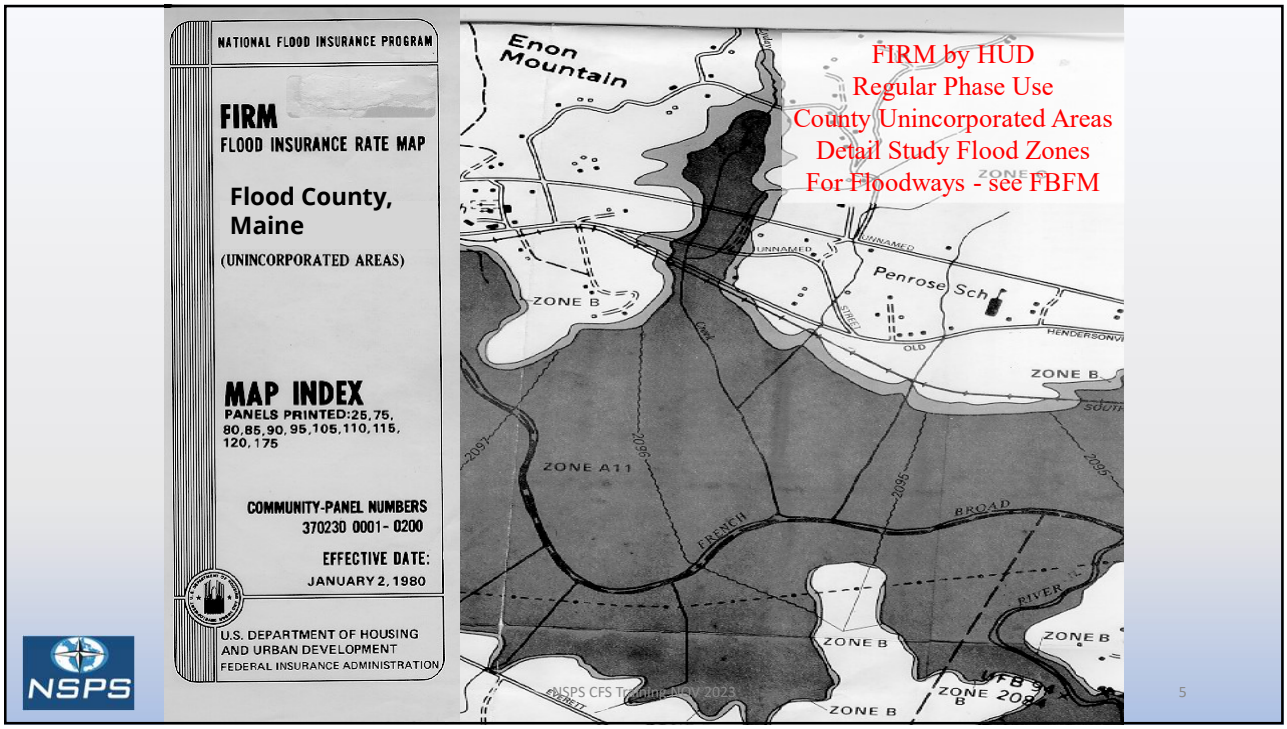
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
Flood County, Maine
(UNINCORPORATED AREAS)
MAP INDEX
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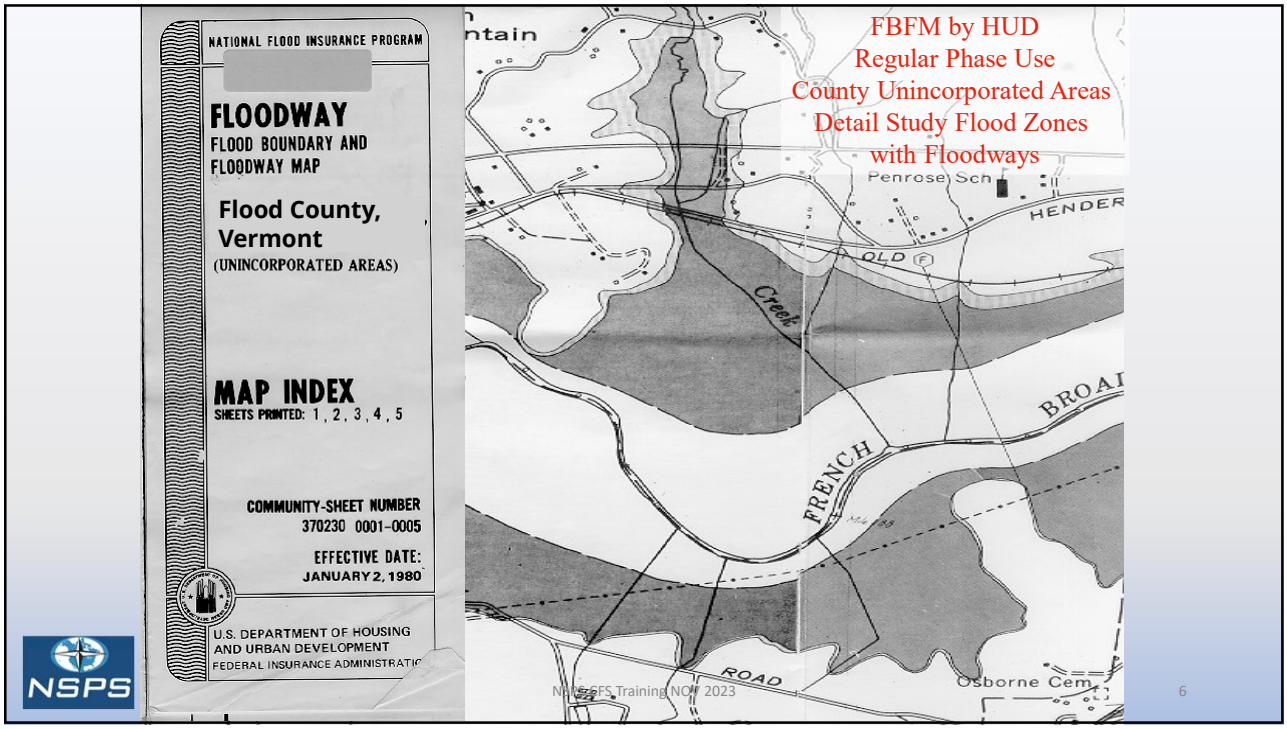
COMMUNITY-PANEL NUMBERS
370230 0001- 0200
EFFECTIVE DATE:
JANUARY 2, 1980
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION
Enon Mountain
ZONE B
ZONE A11
ZONE B
ZONE B
ZONE B
ZONE B
Penrose Sch
FRENCH
BROAD
RIVER
FIRM by HUD
Regular Phase Use
County Unincorporated Areas
Detail Study Flood Zones
For Floodways - see FBFM

5


NATIONAL FLOOD INSURANCE PROGRAM
FLOODWAY
FLOOD BOUNDARY AND FLOODWAY MAP
Flood County, Vermont
(UNINCORPORATED AREAS)
MAP INDEX
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370230 0001-0005
EFFECTIVE DATE:
JANUARY 2, 1980
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATIC
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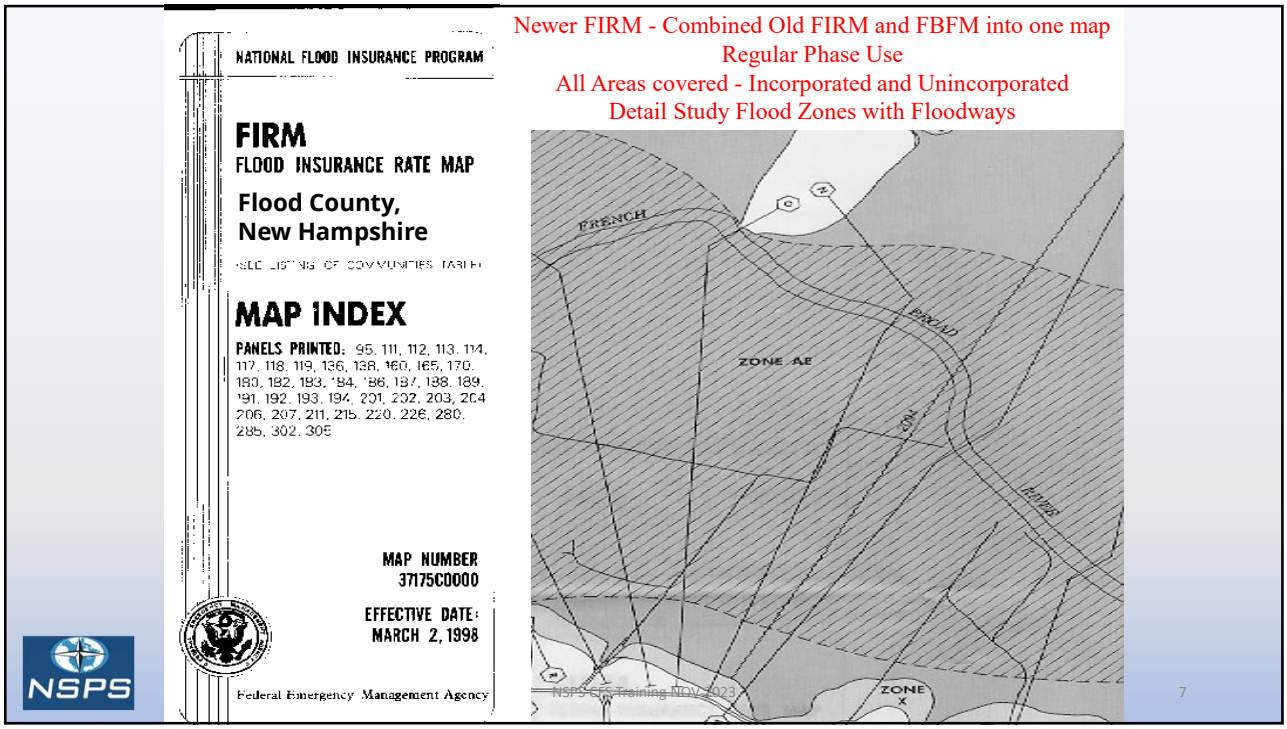
HENDER
QLD
Creek
FRENCH
BROAI
ROAD
Osborne Cem
FBFM by HUD
Regular Phase Use
County Unincorporated Areas
Detail Study Flood Zones
with Floodways

6


NATIONAL FLOOD INSURANCE PROGRAM
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FLOOD INSURANCE RATE MAP
Flood County,
New Hampshire
MAP INDEX
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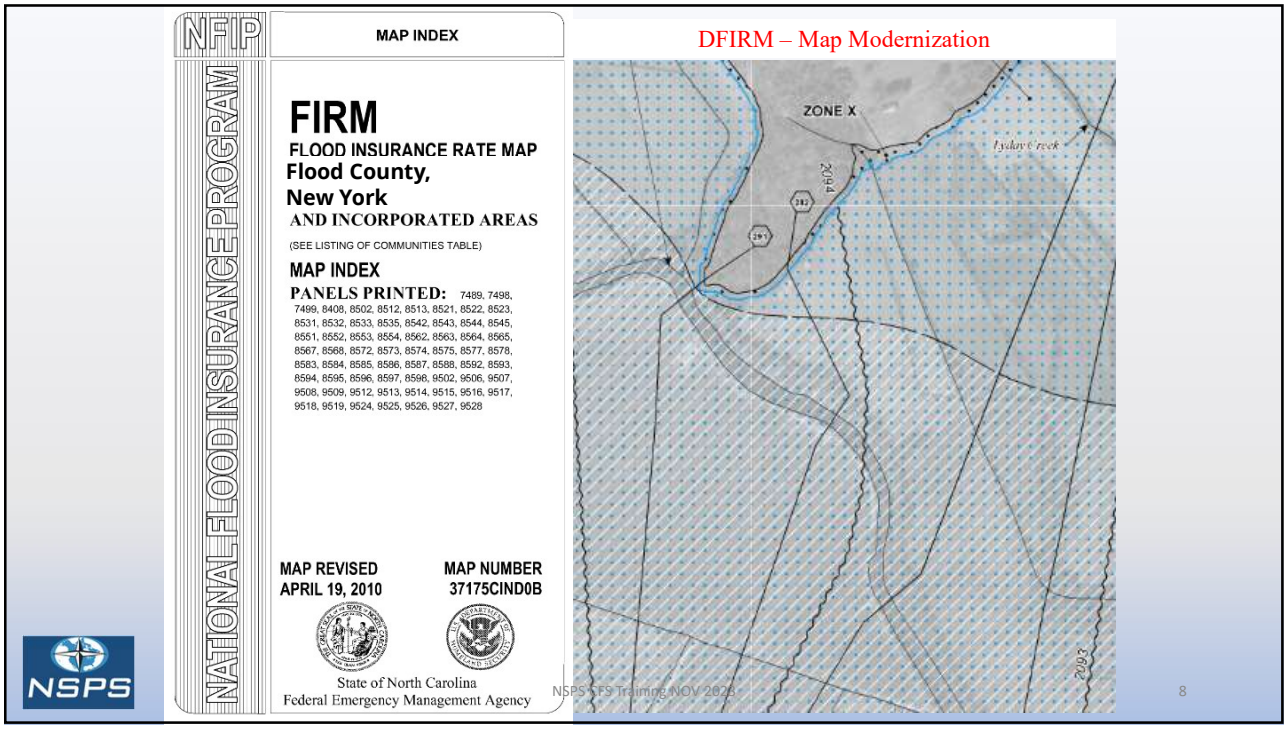
MAP NUMBER
37175C0000
EFFECTIVE DATE:
MARCH 2, 1998
Federal Emergency Management Agency
Newer FIRM - Combined Old FIRM and FBFM into one map
Regular Phase Use
All Areas covered - Incorporated and Unincorporated
Detail Study Flood Zones with Floodways
FRENCH
BROAD
ZONE AE
ZONE X
NSPS CFS Training NOV 2023
7

7


NFIP
NATIONAL FLOOD INSURANCE PROGRAM
MAP INDEX
FIRM
FLOOD INSURANCE RATE MAP
Flood County,
New York
AND INCORPORATED AREAS
(SEE LISTING OF COMMUNITIES TABLE)
MAP INDEX
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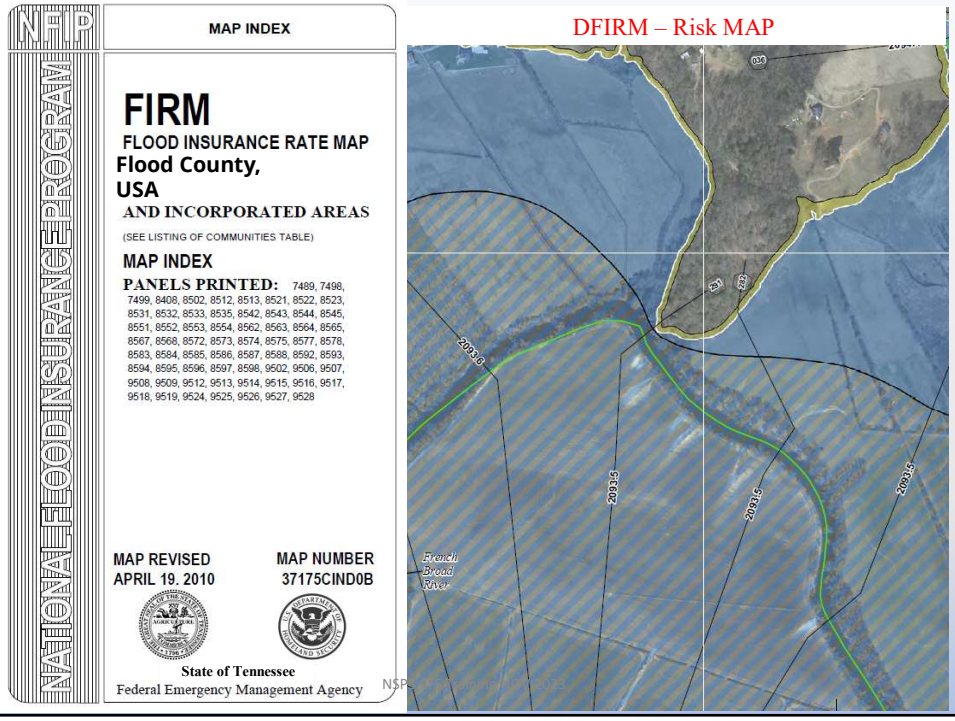
MAP REVISED
APRIL 19, 2010
MAP NUMBER
37175CIND0B
State of North Carolina
Federal Emergency Management Agency
DFIRM – Map Modernization
ZONE X
Sydays creek
2094
2093
NSPS CFS Training NOV 2023
8

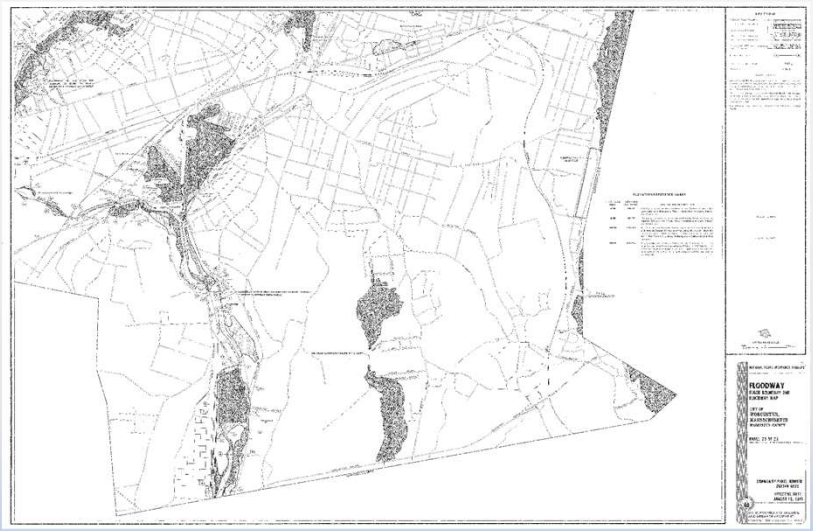
8



DFIRM – Risk MAP

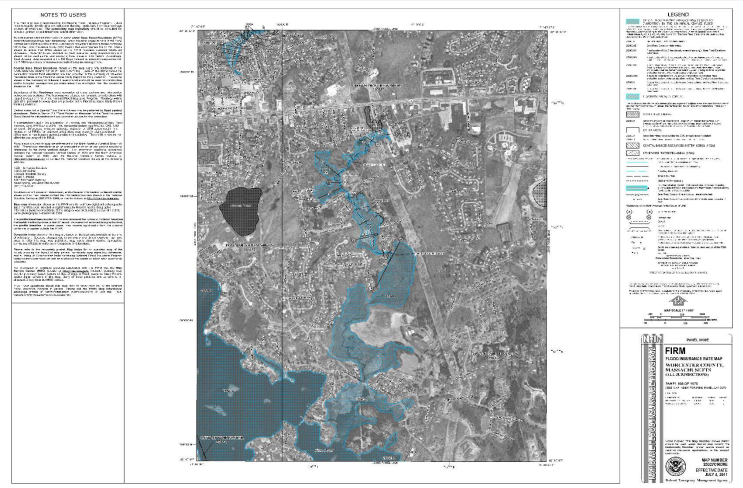
9

FEMA Flood Boundary Floodway Map (1980)



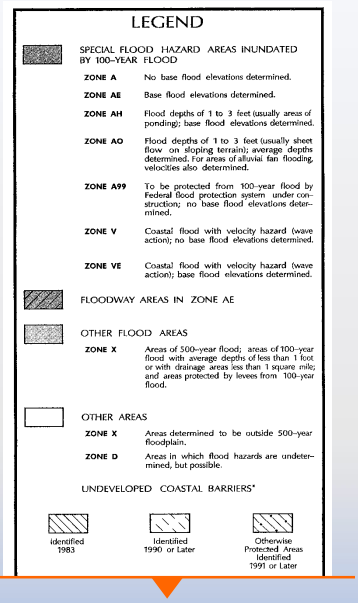
10

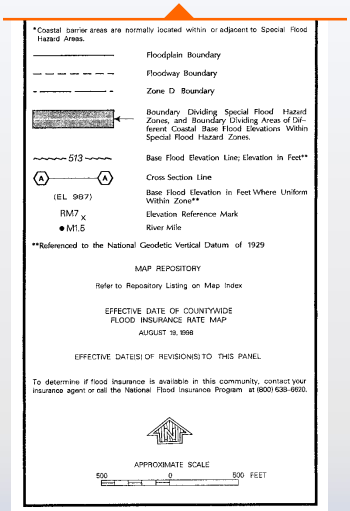
Digital FIRM (DFIRM) – Map Modernization (2011)



11

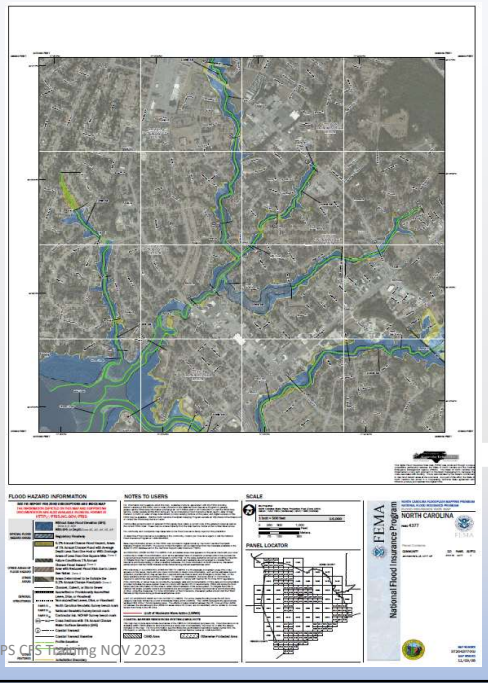
Legend





12

Digital FIRM (DFIRM) – Risk MAP



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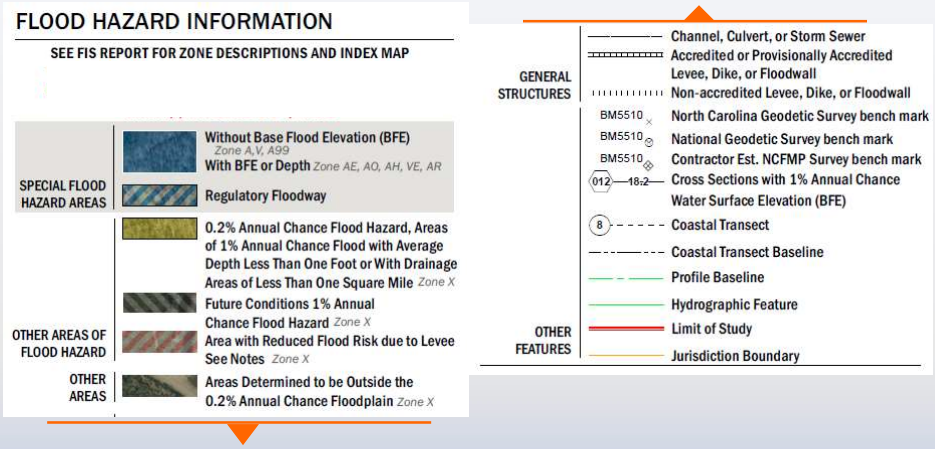


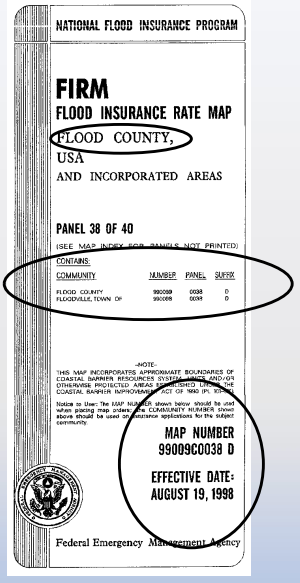
14

Basic Elements of Flood Maps:

Title Block

Found on each panel, the title box contains:

- Community name
- Community ID no.
- Map and Panel number
- other information necessary to identify the flood map panel correctly.



15

Title Blocks

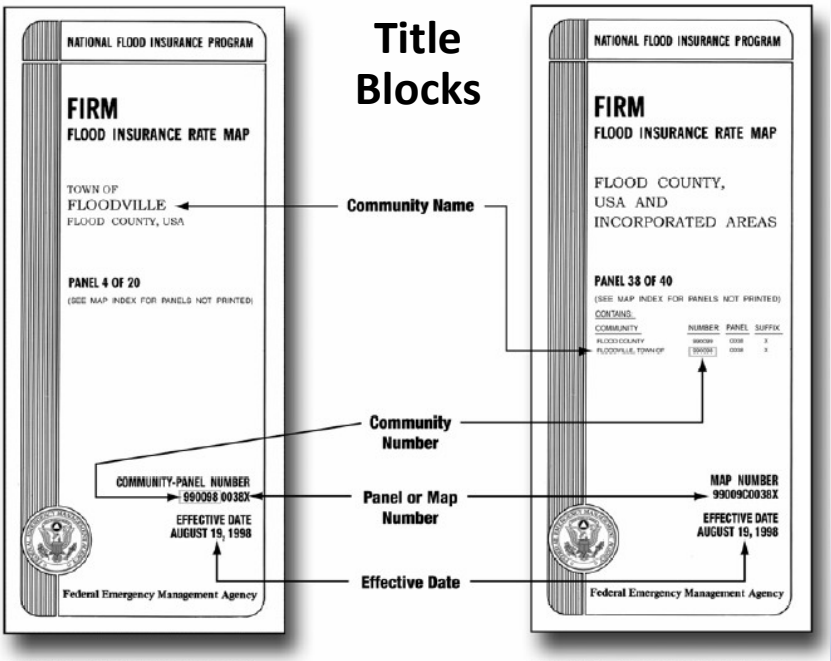


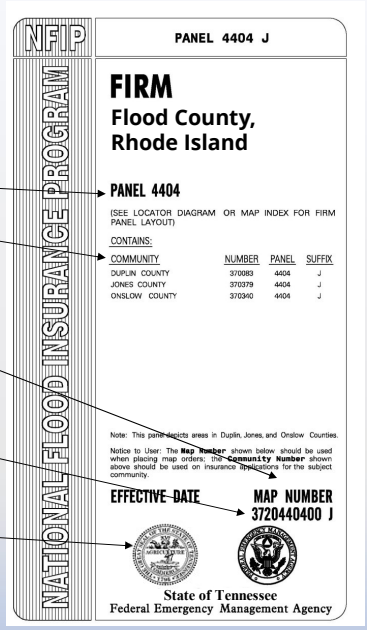
Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

16

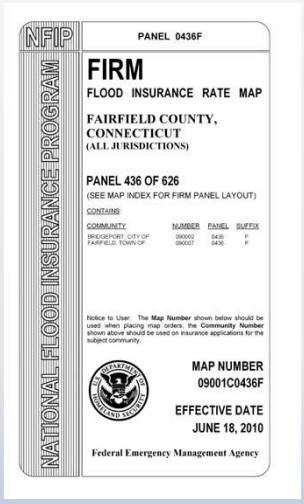
Title Block

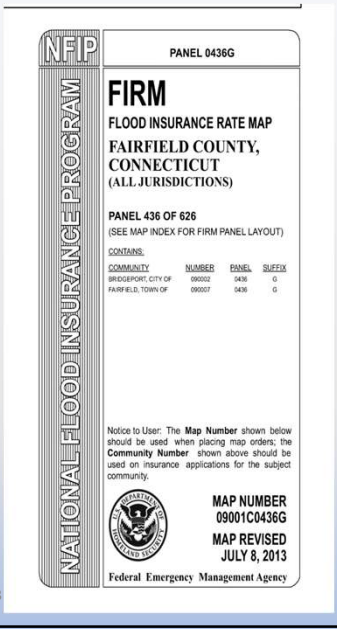
- Statewide FIRM
- 4-digit panel number
- Community names and CID numbers
- 10-digit map numbering system based on state plane coordinates
- New suffixes (in this started with letter J)
- State of TN and FEMA Seals



17

Is your FIRM panel still Effective?





18

Community Status Book

https://www.fema.gov/national-flood-insurance-program-community-status-book

Communities participating in the NFIP

- Community Identification Number
- Date of Entry
- Current Effective Map (Index)

Communities not participating with SFHA identified

- Date Hazard Area Identified
- Date on which Sanctions Apply

- Maine Link: https://www.fema.gov/cis/ME.html

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Community Status Book

- https://www.fema.gov/cis/ME.pdf

FEMA

Community Status Book Report
Communities Participating in the National Flood Program

MAINE

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
230406#	ABBOT, TOWN OF	PISCATAQUIS COUNTY	02/14/75	09/15/78	09/30/93	09/15/78	No					
230190#	ACTON, TOWN OF	YORK COUNTY	02/21/75	06/05/85	06/05/85	06/05/85	No					
230688#	ADAMSTOWN T04 R02 WBKP, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230132A	ADDISON, TOWN OF	WASHINGTON COUNTY	10/18/74	07/16/91	07/18/17	07/16/91	No					
230606#	ALBANY, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230231#	ALBION, TOWN OF	KENNEBEC COUNTY	02/21/75	09/27/85	06/16/11	09/27/85	No					
230713	ALDER BROOK T3 R3 NBKP, TOWNSHIP OF	SOMERSET COUNTY			(NSFHA)	04/30/84	No					
230852	ALDER STREAM T02 R08 WBKP, TOWNSHIP OF	FRANKLIN COUNTY			(NSFHA)	04/30/84	No					
230303A	ALEXANDER, TOWN OF	WASHINGTON COUNTY	12/06/74	09/04/85	07/18/17(M)	09/04/85	No					
230191#	ALFRED, TOWN OF	YORK COUNTY	02/21/75	07/16/90	05/18/98	07/16/90	No	10/01/91	10/01/93	8	10%	05%
230440#	ALLAGASH, TOWN OF	AROOSTOOK COUNTY	02/14/75	08/05/85	04/02/03	08/05/85	No					
	FORMERLY ALLAGASH PLANTATION											
230083A	ALNA, TOWN OF	LINCOLN COUNTY	01/03/75	03/01/05	07/16/15(M)	03/01/05	No					
230101	ALTON, TOWN OF	PENOBSCOT COUNTY	02/28/75	09/18/85	09/18/85(M)	09/18/85	No					
230272A	AMHERST, TOWN OF	HANCOCK COUNTY	01/24/75	07/20/16	07/20/16(M)	02/22/17	No					
230418	AMITY, TOWN OF	AROOSTOOK COUNTY	01/17/75	08/19/85	08/19/85(M)	08/19/85	No					
230689#	ANDOVER NORTH SURPLUS, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230690#	ANDOVER WEST SURPLUS, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230160#	ANDOVER, TOWN OF	OXFORD COUNTY	11/08/74	01/03/85	07/07/09	01/03/85	No					
230967A	ANDREWS ISLAND	KNOX COUNTY		02/23/01	07/06/16	04/30/84	No					
230123#	ANSON, TOWN OF	SOMERSET COUNTY	07/23/76	07/15/88	07/03/95	07/15/88	No					
230714	APPLETON T6 R7 BKP WKR, TOWNSHIP OF	SOMERSET COUNTY			(NSFHA)	04/30/84	No					
230073A	APPLETON, TOWN OF	KNOX COUNTY	08/02/74	12/04/85	07/06/16	12/04/85	No					
230464	ARGYLE, TOWNSHIP OF	PENOBSCOT COUNTY	02/21/75	09/18/85	09/18/85(M)	09/18/85	No					
230208#	ARROWSIC, TOWN OF	SAGADAHOC COUNTY	01/17/75	05/15/91	07/16/15	05/15/91	No	10/01/93	10/01/18	8	10%	05%

20

Community Status Book

https://www.fema.gov/cis/ME.pdf

FEMA

Community Status Book Report

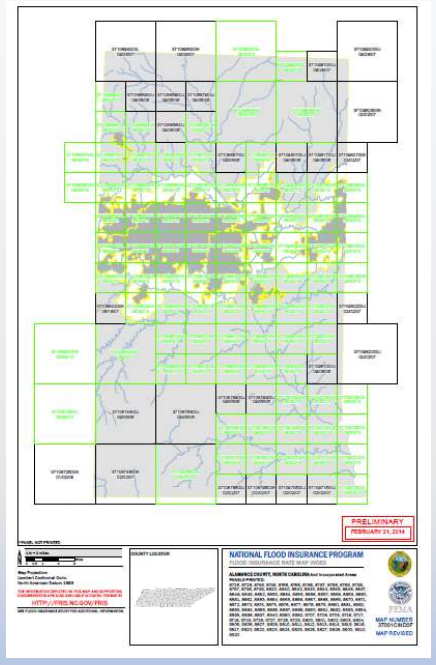
Communities Participating in the National Flood Program

MAINE

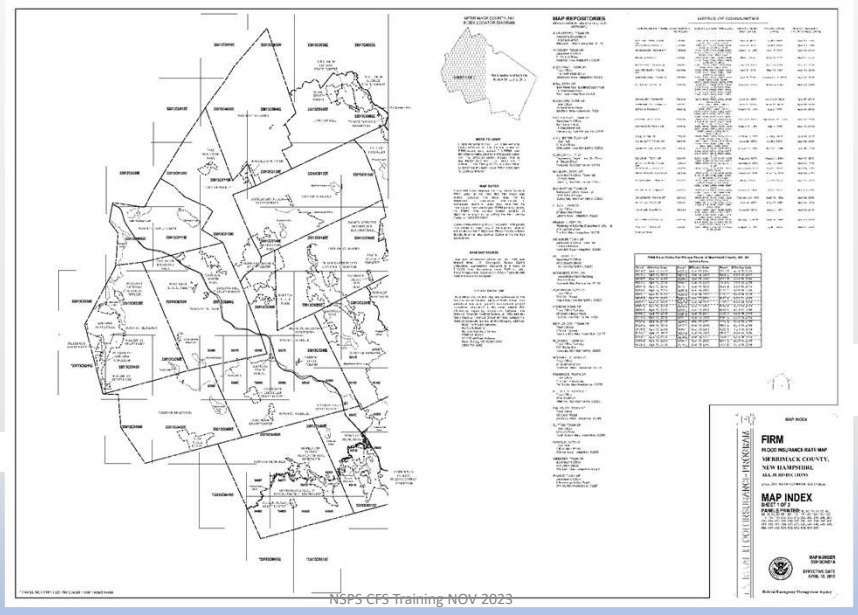
CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal	CRS Entry Date	Curr Eff Date	Curr Class	% Disc SFHA	% Disc Non SFHA
230406#	ABBOT, TOWN OF	PISCATAQUIS COUNTY	02/14/75	09/15/78	09/30/93	09/15/78	No					
230190#	ACTON, TOWN OF	YORK COUNTY	02/21/75	06/05/85	06/05/85	06/05/85	No					
230688#	ADAMSTOWN T04 R02 WBKP, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230132A	ADDISON, TOWN OF	WASHINGTON COUNTY	10/18/74	07/16/91	07/18/17	07/16/91	No					
230606#	ALBANY, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230231#	ALBION, TOWN OF	KENNEBEC COUNTY	02/21/75	09/27/85	06/16/11	09/27/85	No					
230713	ALDER BROOK T3 R3 NBKP, TOWNSHIP OF	SOMERSET COUNTY			(NSFHA)	04/30/84	No					
230852	ALDER STREAM T02 R08 WBKP, TOWNSHIP OF	FRANKLIN COUNTY			(NSFHA)	04/30/84	No					
230303A	ALEXANDER, TOWN OF	WASHINGTON COUNTY	12/06/74	09/04/85	07/18/17(M)	09/04/85	No					
230191#	ALFRED, TOWN OF	YORK COUNTY	02/21/75	07/16/90	05/18/98	07/16/90	No	10/01/91	10/01/93	8	10%	05%
230440#	ALLAGASH, TOWN OF	AROOSTOOK COUNTY	02/14/75	08/05/85	04/02/03	08/05/85	No					
	FORMERLY ALLAGASH PLANTATION											
230083A	ALNA, TOWN OF	LINCOLN COUNTY	01/03/75	03/01/05	07/16/15(M)	03/01/05	No					
230101	ALTON, TOWN OF	PENOBSCOT COUNTY	02/28/75	09/18/85	09/18/85(M)	09/18/85	No					
230272A	AMHERST, TOWN OF	HANCOCK COUNTY	01/24/75	07/20/16	07/20/16(M)	02/22/17	No					
230418	AMITY, TOWN OF	AROOSTOOK COUNTY	01/17/75	08/19/85	08/19/85(M)	08/19/85	No					
230689#	ANDOVER NORTH SURPLUS, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230690#	ANDOVER WEST SURPLUS, TOWNSHIP OF	OXFORD COUNTY		07/07/09	(NSFHA)	04/30/84	No					
230160#	ANDOVER, TOWN OF	OXFORD COUNTY	11/08/74	01/03/85	07/07/09	01/03/85	No					
230967A	ANDREWS ISLAND	KNOX COUNTY		02/23/01	07/06/16	04/30/84	No					
230123#	ANSON, TOWN OF	SOMERSET COUNTY	07/23/76	07/15/88	07/03/95	07/15/88	No					
230714	APPLETON T6 R7 BKP WKR, TOWNSHIP OF	SOMERSET COUNTY			(NSFHA)	04/30/84	No					
230073A	APPLETON, TOWN OF	KNOX COUNTY	08/02/74	12/04/85	07/06/16	12/04/85	No					
230464	ARGYLE, TOWNSHIP OF	PENOBSCOT COUNTY	02/21/75	09/18/85	09/18/85(M)	09/18/85	No					
230208#	ARROWSIC, TOWN OF	SAGADAHOC COUNTY	01/17/75	08/19/85	07/16/15	05/15/91	No	10/01/93	10/01/18	8	10%	05%

Map Index

- New Risk Map-style Index Map
- 11 X 17 format
- Portrait layout
- List of Communities has been removed.



Map Index

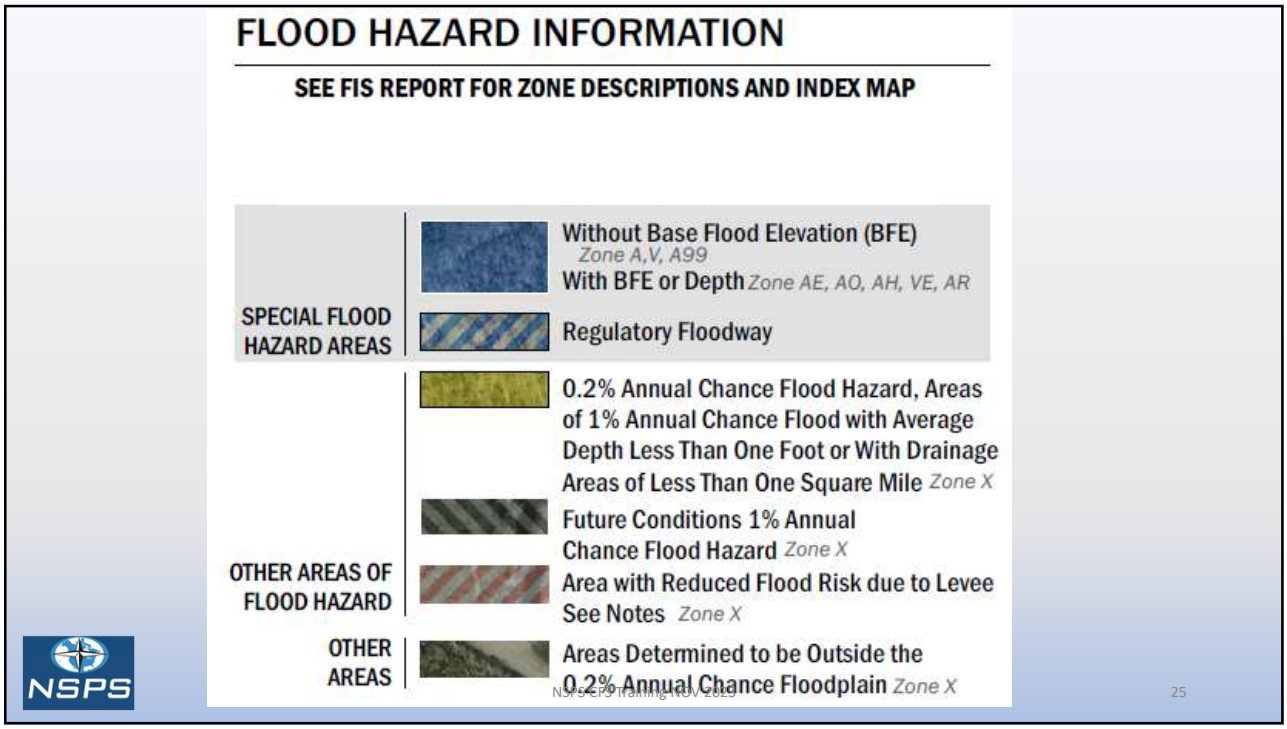


23

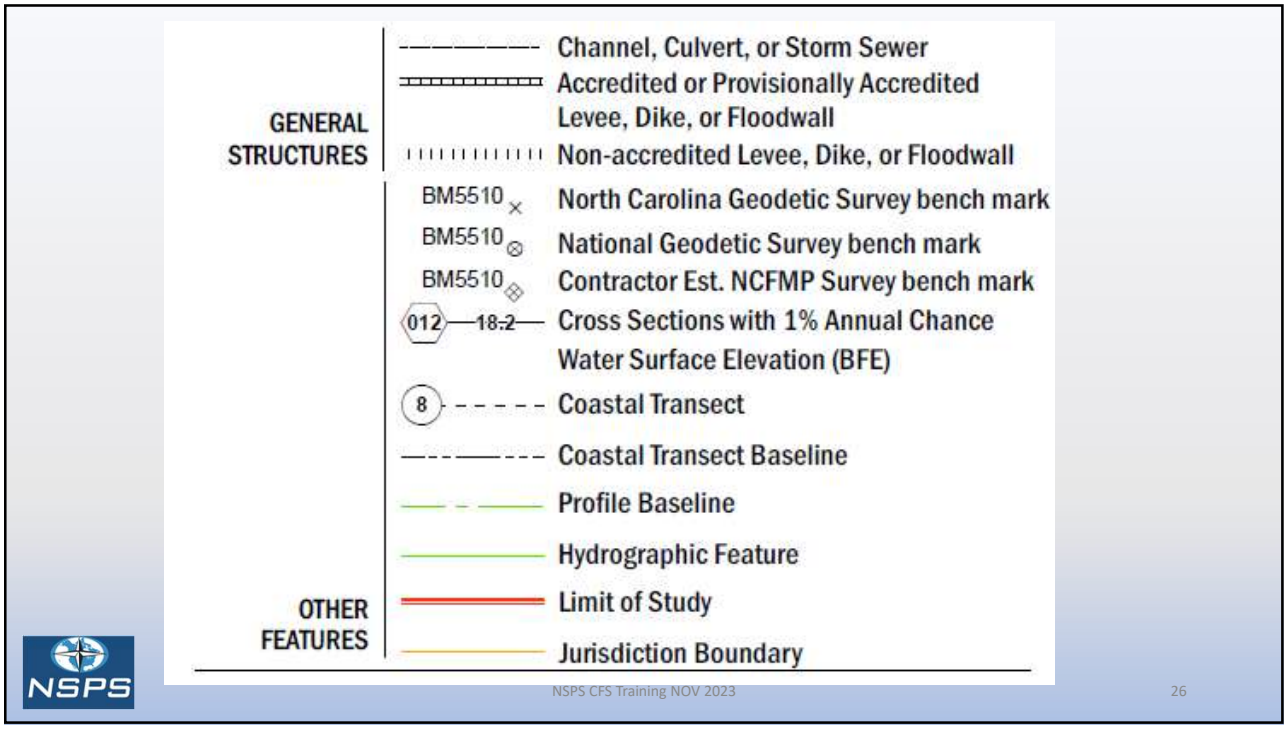
Using a FIRM and its components

- Flood Insurance Rate Map (FIRM) panels:
  - Show relationship between base map features and SFHA
  - Indicate flooding source name, floodway, flood zones, Base Flood Elevation (BFE) lines, cross section lines, and road network
  - Primary tool for floodplain management
- Flood Insurance Study (FIS) text:
  - Designed to accompany maps and provide detailed information about community and its flooding sources
  - Contains information about hydrologic and hydraulic studies used to create maps
  - Contains Floodway Data Tables and Flood Profiles

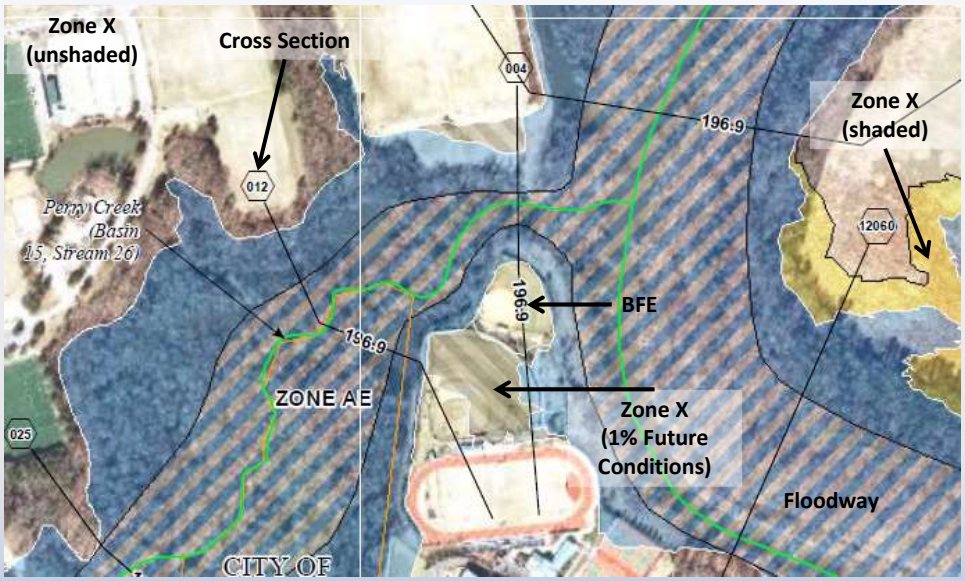
24


FLOOD HAZARD INFORMATION
SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
SPECIAL FLOOD HAZARD AREAS
Without Base Flood Elevation (BFE) Zone A,V, A99
With BFE or Depth Zone AE, AO, 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
OTHER AREAS
Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
NSPS
NSPS CFS Training NOV 2023
25

25

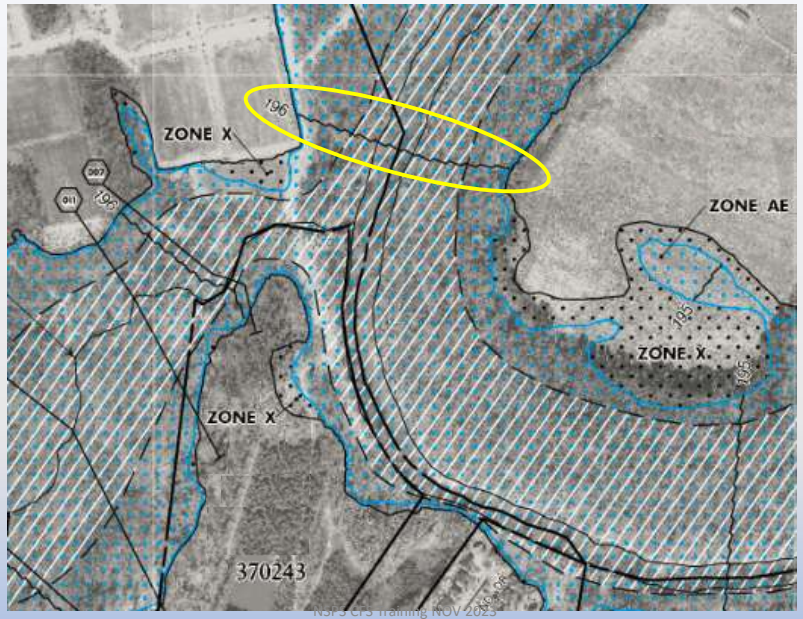

GENERAL STRUCTURES
Channel, Culvert, or Storm Sewer
Accredited or Provisionally Accredited Levee, Dike, or Floodwall
Non-accredited Levee, Dike, or Floodwall
BM5510
North Carolina Geodetic Survey bench mark
BM5510
National Geodetic Survey bench mark
BM5510
Contractor Est. NCFMP Survey bench mark
012
18.2
Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
8
Coastal Transect
Coastal Transect Baseline
Profile Baseline
Hydrographic Feature
OTHER FEATURES
Limit of Study
Jurisdiction Boundary
NSPS
NSPS CFS Training NOV 2023
26

26



27

What about those wavy BFE lines?



28

What about those wavy BFE lines?

- Rounded to the nearest whole foot.
- Use for insurance rating, not compliance.
- Could be placed within 0.5’ of the actual BFE value.
- Cross-sections are based on the hydraulic models.
- FEMA’s Guidelines and Standards for Flood Risk Analysis and Mapping remove this feature.

29

BFE Determination from Flood Profile

- Once subject is plotted, draft line perpendicular to floodplain at upstream portion of subject
- Using reliable measuring tool, measure distance from nearest cross section to drafted line following streamline or Profile Baseline
- Convert this map distance to appropriate physical distance using map scale

30

BFE Determination from Flood Profile
(Continued)

- Convert physical distance to units as measured on Flood Profile
- On Flood Profile, start at chosen cross section and measure calculated distance to drafted line
- Mark location by drawing a vertical line at this point, intersecting water-surface elevations on Flood Profile

31

BFE Determination from Flood Profile
(Continued)

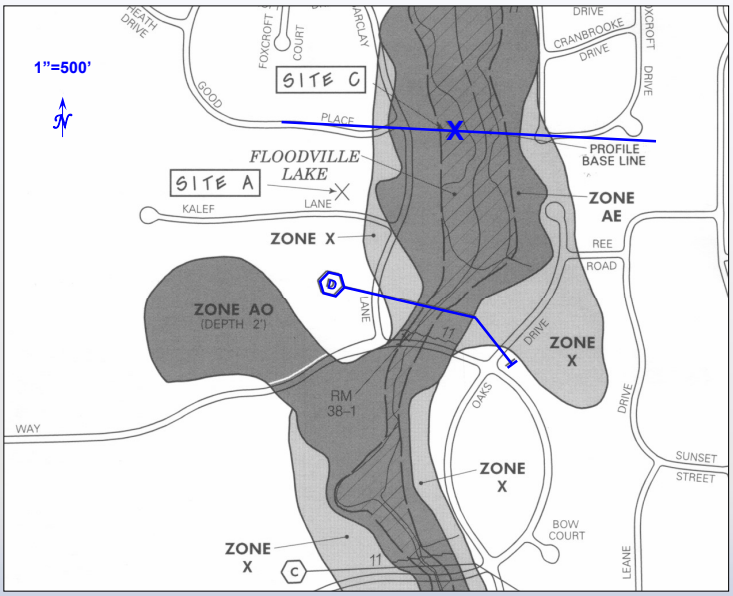
- Read 1% annual chance flood elevation where vertical line intersects 100-year flood elevation profile line
- Round this number to the nearest 0.1 foot
- Check work against Floodway Data Table

32

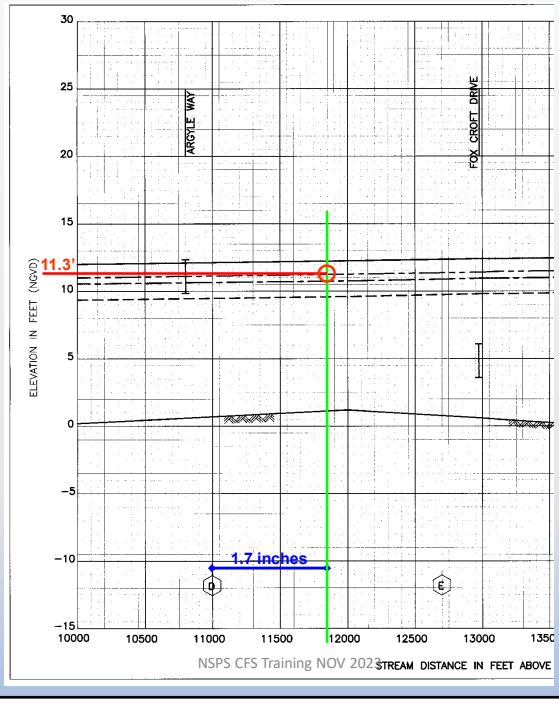
Example 1

- Site C - Floodville
  - Map scale is 1”=500’; flooding source is Rocky River
  - Distance from Site C to Cross Section D is 1.7”
  - 1.7” x 500’ = 850’; therefore, Site C is 850’ upstream of Cross Section D
  - Rocky River Flood Profile from FIS report is at a horizontal scale of 1”=500’
  - 850’ x 1”/500’ = 1.7” on Flood Profile
  - Measure 1.7” upstream from Cross Section D on the Flood Profile
  - Draw vertical line at this point, and read 1% annual chance flood elevation, which is 11.3’

33



34



35

Check your answer

- Floodway Data Table lists each cross section and regulatory flooding elevation as represented in model used to create floodplains shown on the flood maps
- Floodway Data Table (FDT) for Rocky River is in Table 6
- Notice that Site C is located between Cross Sections D and E on FIRM
- Compare measured 1% annual chance flood elevation from Flood Profile to Regulatory column in FDT; measured value should fall between values listed for bracketing cross sections
- FDT lists 1% annual chance flood elevation as 11.2’ and 11.3’; the measured value of 11.3’ falls within accepted range of values
- Also note that value of 11.3’ is significantly higher than 11’ indicated by BFE lines on FIRM

36

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rocky River								
A	4,395	115	1,233	6.1	9.9	9.9	10.0	0.1
B	5,537	13	142	9.2	10.4	10.4	10.5	0.1
C	9,610	100	323	8.4	10.9	10.9	11.1	0.2
D	10,995	85	881	7.2	11.2	11.2	11.3	0.1
E	12,695	245	1,887	5.1	11.3	11.3	11.4	0.1
F	13,845	270	2,403	4.5	11.5	11.5	11.5	0.0
G	14,513	230	2,553	3.7	11.6	11.6	11.6	0.0
H	16,625	180	2,000	4.2	11.7	11.7	11.7	0.0
I	18,209	415	2,566	3.9	12.5	12.5	12.7	0.2
J	20,849	230	2,381	4.0	13.0	13.0	13.2	0.2
K	25,360	340	2,924	3.6	14.0	14.0	14.2	0.2

[1]Feet above county boundary

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOOD COUNTY, USA
AND INCORPORATED AREAS

FLOODWAY DATA

ROCKY RIVER

37

BFE Interpolation in Limited Detailed Study Areas

- Once subject is plotted, draft line perpendicular to floodplain at upstream portion of subject
- Using measuring instrument, measure distance between cross sections that bracket site, following streamline or Profile Baseline
- Calculate slope of stream — divide difference in elevation by distance between two cross sections
- Measure distance from subject and downstream cross section
- Multiply slope by distance between site and downstream cross section and add this number to elevation of downstream cross section
- Result is BFE at subject site

38

$$\left[\left(\frac{E2-E1}{X2-X1}\right) \times D\right]+E1 = BFE$$

E1= Elevation of Downstream cross section

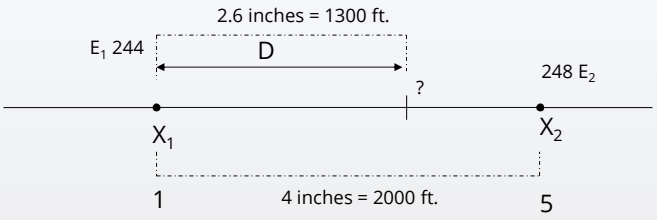
E2= Elevation of Upstream cross section

X2-X1= Distance between cross sections

D= Distance between downstream cross section and Subject Site

39

Scale 1=500 ft.



$$\left[\left(\frac{248-244}{(4 \text{ inches} \times 500 \text{ ft./1 inch}) = 2000 \text{ ft.}}\right) \text{X } 1300 \text{ ft.}\right] + 244 \text{ ft.}$$

[.002 x 1,300 ft.]+ 244 ft.

2.6+ 244= 246.6 ft.

40

BFE Interpolation in Limited Detailed Study Areas

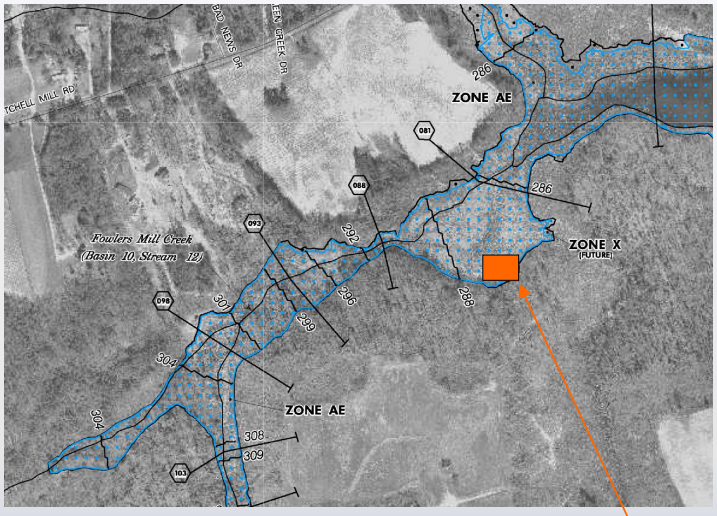
- This method will be used to determine flood elevation on Limited Detailed Study areas, which were first used on Tennessee FIRMs

41

Exercise 1 – Determine BFE

Interpolate the BFE for the property shown along Fowlers Mill Creek (Basin 10, Stream 12), using the example Limited Detailed Flood Hazard Data Table

42



Scale: 1"=500'

Subject Property

43

TABLE 14—Limited Detailed Flood Hazard Data

Cross Section[1]	Stream Station[2]	Existing Flood Discharge *(cfs)*	Future Flood Discharge *(cfs)*	1% Annual Chance Existing Water-Surface Elevation *(feet NAVD 88)*	1% Annual Chance Future Water-Surface Elevation[3] *(feet NAVD 88)*	Non - Encroachment Width[4] *(feet)*
FOWLERS MILL CREEK (BASIN 10, STREAM 12)						
050	5,049	3,101	3,874	275.9	276.4	209 / 202
055	5,530	3,101	3,874	277.5	278.1	209 / 202
071	7,092	2,556	3,335	286.0	286.6	431 / 273
081	8,130	1,590	2,131	286.1	286.7	276 / 428
088	8,753	1,590	2,131	289.9	290.4	35 / 30
093	9,275	1,590	2,131	298.5	299.1	48 / 126
098	9,787	1,373	1,872	301.9	302.5	116 / 50
103	10,335	1,373	1,872	308.5	309.2	30 / 50
107	10,653	1,373	1,872	312.6	313.4	26 / 35

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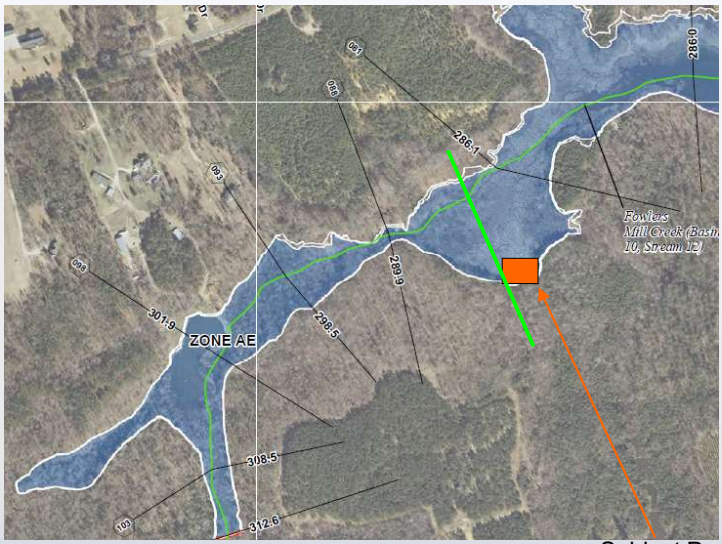
Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Fowlers Mill Creek (Basin 10, Stream 12)				
006	648	3,101	266.3[1]	158 / 90
011	1,086	3,101	266.3[1]	191 / 90
015	1,472	3,101	266.3[1]	100 / 125
020	2,033	3,101	266.3	50 / 150
026	2,584	3,101	267.2	200 / 90
030	3,023	3,101	267.9	170 / 80
039	3,949	3,101	272.6	37 / 200
044	4,390	3,101	274.2	209 / 202
050	5,048	3,101	275.9	209 / 202
055	5,530	3,101	277.5	209 / 202
071	7,092	2,556	286.0	431 / 273
081	8,130	1,590	286.1	276 / 428
088	8,753	1,590	289.9	35 / 30
093	9,275	1,590	298.5	48 / 126
098	9,787	1,373	301.9	116 / 50
103	10,335	1,373	308.5	30 / 50
107	10,653	1,373	312.6	26 / 35

45



Scale: 1”=500’

Subject Property

46

Exercise 1 – Review Answers

47

Stillwater Elevations

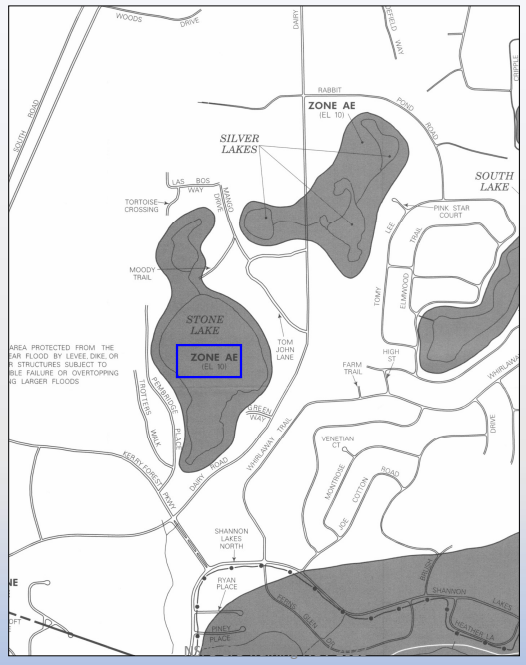
- BFEs are also shown on a FIRM where flood water has a static elevation
- This is known as **Stillwater BFE** and is shown on FIRM as, for example, **ZONE AE (EL 10)**
- Stillwater elevation on FIRM does not represent true elevation but rather a 'rounded' whole number value
- True Stillwater elevation values are found in FIS report in Summary of Stillwater Elevations table, and should be used to make determinations as they are shown to the nearest 0.1 foot

48

Example 2

- Stone Lake on FIRM panel
  - BFE is listed at 10 feet NGVD 29
  - Summary of Stillwater Elevations table, indicates 1% annual chance (100-Year) flood elevation of Stone Lake is 10.2 feet NGVD 29

49



50

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[1]	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

[1] Includes wave set-up of 0.5 foot

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Example 3

- Kingdom Way on FIRM panel 40
  - BFE is listed at 10 feet NGVD 29
  - Summary of Stillwater Elevations table, indicates 1% annual chance (100-Year) flood elevation of Atlantic Ocean is 10.0 feet NGVD 29, which includes 0.5 foot of wave set up.
  - Stillwater Elevations from the Transect Data table, also indicates 1% annual chance (100-Year) flood elevation of Atlantic Ocean is 10.0 feet NGVD 29, which includes 0.5 foot of wave set up.

52


ZONE AE
(EL 10)
ZONE VE
(EL 12)
ZONE AE
(EL 11)
ZONE VE
(EL 13)
FLOOD REGIONAL PARK
POTTS LAKE
APOLLO TRAIL
CITATION TRAIL
VENTURE TRAIL
CAVALCADE TRAIL
COUNT TRAIL
PIMICO DRIVE
SHANNON LAKES
HEATHER LA
KINGDOM WAY
NORTH
PUBLIC WAY
RODNEY WAY
BRUSH DRIVE

53

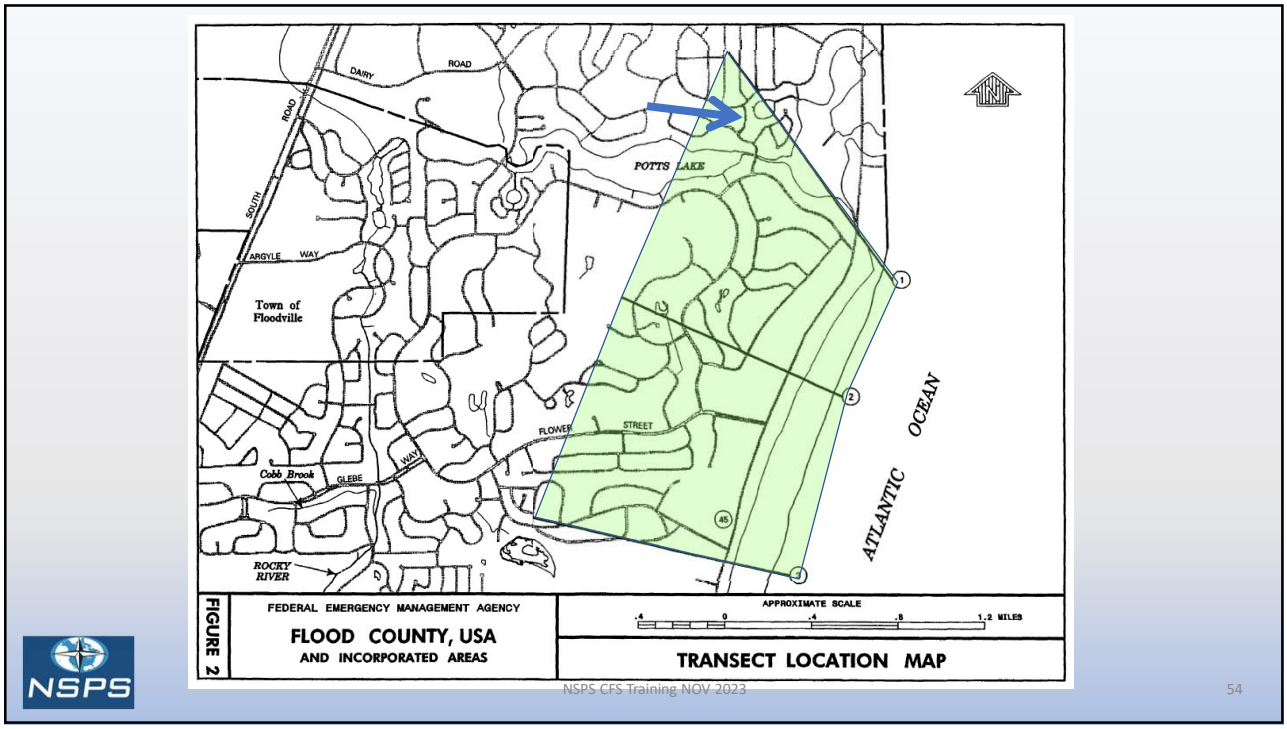
DAIRY ROAD
SOUTH ROAD
POTTS LAKE
ARGYLE WAY
Town of Floodville
FLOWER STREET
Cobb Brook
GLEBE WAY
ROCKY RIVER
ATLANTIC OCEAN
FIGURE 2
FEDERAL EMERGENCY MANAGEMENT AGENCY
FLOOD COUNTY, USA
AND INCORPORATED AREAS
APPROXIMATE SCALE
.4 0 .4 .8 1.2 MILES
TRANSECT LOCATION MAP

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TABLE 4 - TRANSECT DESCRIPTIONS

TRANSECT	LOCATION	ELEVATION (feet NGVD) 100-YEAR STILLWATER	ELEVATION (feet NGVD) MAXIMUM 100-YEAR WAVE CREST[2]
1	Shoreline of Flood County, approximately 1,000 feet southeast of the intersection of Tralee Road and McLaughlin Drive, extending inland approximately 5,400 feet to Old Ventura.	10.0[1]	14.2
2	Shoreline of Flood County, between McLaughlin Drive and Flower Street, extending inland approximately 4,300 feet to Palmeri Drive.	10.0[1]	14.2
3	Shoreline of Flood County approximately 300 feet southwest of the intersection of State Route 45 and View Way, extending inland approximately 4,700 feet to Stone Trail.	10.0[1]	14.2

[1] Includes wave setup of 0.5 foot
[2] Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM

Each transect was taken perpendicular to the shoreline and extended inland to a point where wave action ceased. Along each transect, wave heights and elevations were computed considering effects of changes in ground elevation, vegetation, and physical features. The stillwater elevations for the 100-year flood were used as the starting elevations for these computations. Wave heights were calculated to the nearest 0.1 foot, and wave elevations were determined at whole-foot increments along the transects. The location of the 3-foot breaking wave for determining the terminus of the V Zone (area with velocity wave action) was also computed at each transect.

55

Table 5, "Transect Data," shows the Atlantic Ocean stillwater elevations and the maximum and minimum VE and AE zone elevations at each transect.

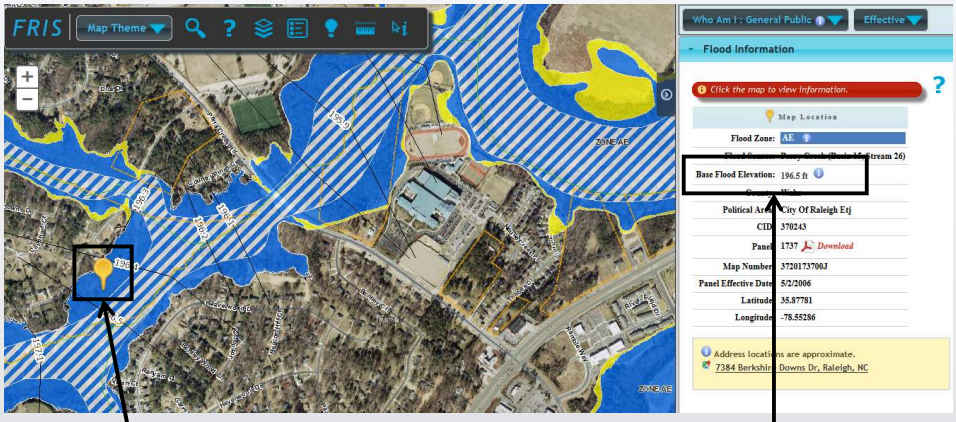
TABLE 5 - TRANSECT DATA

FLOODING SOURCE	STILLWATER ELEVATION (feet NGVD) 10-YEAR	50-YEAR	100-YEAR	500-YEAR	ZONE	BASE FLOOD ELEVATION (feet NGVD)[2]
ATLANTIC OCEAN						
Transect 1	6.7	8.7	10.0[1]	12.6	VE	12-14
					AE	10-12
Transect 2	6.7	8.7	10.0[1]	12.6	VE	13-14
					AE	10-12
					AO	Depth 2'
Transect 3	6.7	8.7	10.0[1]	12.6	VE	12-14
					AE	10-12

[1] Includes wave set-up of 0.5 foot
[2] Because of map scale limitations, base flood elevations shown on the FIRM represent average elevations for the zones depicted.

56

BFE from Rasters

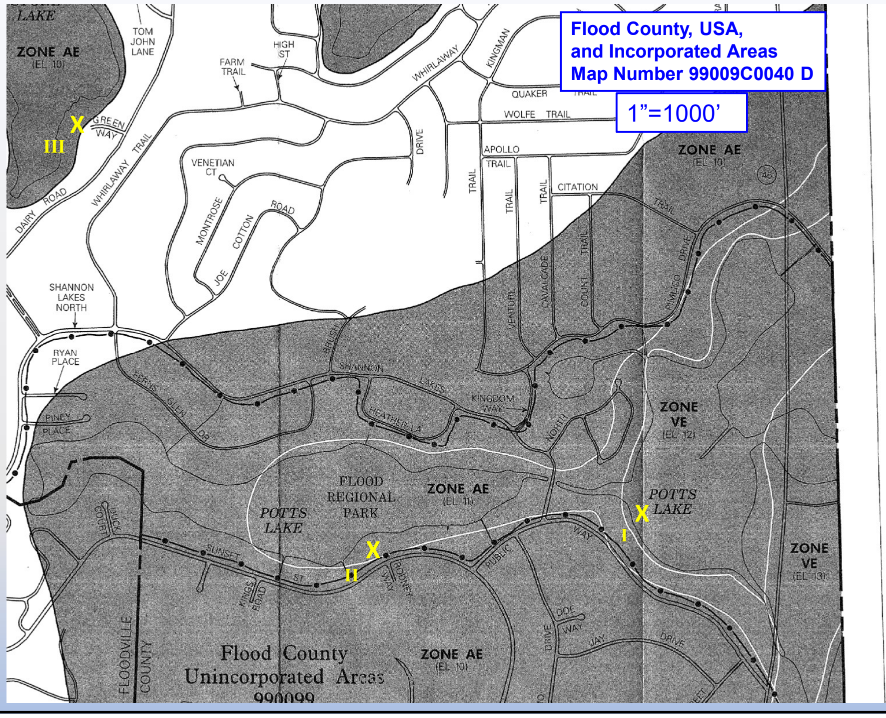


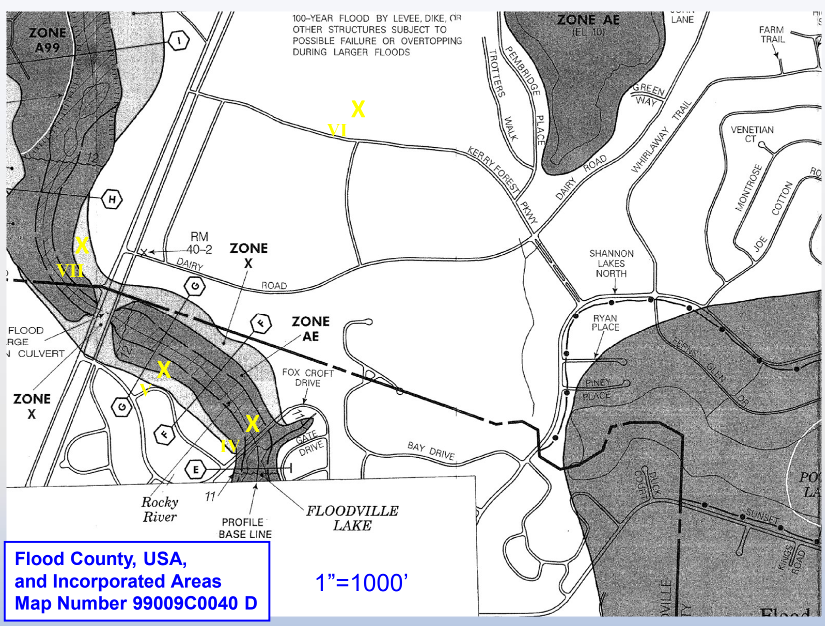
57

Exercise 2 — BFE Determination

- Use the following two slides to complete the Chart for sites **I** through **VII.** Determine BFE at that site
  - Assume site is located at center of 'X' shown
  - See Flood County, USA Map Panel 99009C0040 D and FIS Text
  - Scale of example map is 1"=1,000'

58


Flood County, USA,
and Incorporated Areas
Map Number 99009C0040 D
1”=1000’
ZONE AE
(EL 10)
ZONE AE
(EL 10)
ZONE VE
(EL 12)
FLOOD
REGIONAL
PARK
ZONE AE
(EL 11)
POTTS
LAKE
POTTS
LAKE
ZONE
VE
(EL 13)
ZONE AE
(EL 10)
Flood County
Unincorporated Areas
990099
X
III
X
II
X
I
TOM
JOHN
LANE
FARM
TRAIL
HIGH
ST
WHIRLAWAY
KINGMAN
QUAKER
WOLFE TRAIL
APOLLO
TRAIL
CITATION
VENETIAN
CT
MONTROSE
COTTON
ROAD
JOE
SHANNON
LAKES
NORTH
RYAN
PLACE
PINEY
PLACE
DAIRY ROAD
WHIRLAWAY TRAIL
KINGDOM
WAY
HEATHER LA
SUNSET
ST
FLOODVILLE
COUNTY


100-YEAR FLOOD BY LEVEE, DIKE, OR
OTHER STRUCTURES SUBJECT TO
POSSIBLE FAILURE OR OVERTOPPING
DURING LARGER FLOODS
ZONE
A99
ZONE AE
(EL 10)
X
VI
RM
40-2
ZONE
X
X
VII
ZONE
AE
ZONE
X
X
V
X
IV
FLOOD
RGE
N CULVERT
FOX CROFT
DRIVE
BAY DRIVE
Rocky
River
PROFILE
BASE LINE
FLOODVILLE
LAKE
TROTTERS
WALK
PEMBROKE
PLACE
KERRY FOREST
PKWY
DAIRY ROAD
WHIRLAWAY TRAIL
GREEN
WAY
FARM
TRAIL
VENETIAN
CT
MONTROSE
COTTON
JOE
SHANNON
LAKES
NORTH
RYAN
PLACE
PINEY
PLACE
SUNSET
KINGS
ROAD
Flood County, USA,
and Incorporated Areas
Map Number 99009C0040 D
1”=1000’

BFE Determination Chart
Add Responses Below

Site Number	1% Annual Chance Flood Elevation
I	
II	
III	
IV	
V	
VI	
VII	

61

Review Answers

62

Conclusion

- You should:
  - Be able to determine BFE for subject using Flood Profile, Summary of Stillwater Elevations Table, or the interpolation method for LDS areas

63

Questions?

64

NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 6

Letters of Map Change (LOMC) Descriptions and Policy

October 31 - November 3, 2023

1

This Module Will …

- Review General Responsibilities / Roles
- Describe the types of Letters of Map Change
- FEMA LOMC-related Policy

2

General Responsibilities/Roles

- FEMA
- NFIP
- State NFIP
- Community
- Engineers / Surveyors

3

General Responsibilities/Roles

- FEMA
  - Maintain and Updates the National Flood Insurance Program Maps
    - New Studies
    - CLOMRs / LOMRs / PMRs
  - Respond to Natural Disasters

4

General Responsibilities/Roles

- NFIP
  - Identify and map flood hazard areas
  - Provide a framework for floodplain management regulations
    - Set Minimum Standards
  - Make flood insurance available in communities that participate in the NFIP
    - All properties in participating community are eligible, not just those in the Special Flood Hazard Area (SFHA)

5

General Responsibilities/Roles

- State NFIP
  - Assist Communities in Developing and Adopting Necessary Floodplain Management Measures
  - Through the CAP, Assist Communities to Prevent and Resolve Floodplain Management Issues Before a Flood Event
  - Through Community Assistance Visits (CAV) provide technical assistance to the community and assure that the community is adequately enforcing its floodplain management regulations.
  - Review No-Impact Certifications at Community Request

6

General Responsibilities/Roles

- Community
  - Adopt and Enforce Minimum Floodplain Management Standards
  - Require Permits for **All Development** in the SFHA
  - Ensure that Construction Materials and Methods Used will Minimize Future Flood damage
  - Provide Community Acknowledge Form the property or structure will be **"Reasonably Safe From Flooding"**
  - Review Development for Compliance with NFIP Standards

7

General Responsibilities/Roles

- Surveyors
  - Comply with State Rules
  - Produce applications for LOMCs
  - Complete MT-1 forms and Elevation Certificates
  - Follow Guidelines and Specifications for Flood Hazard Mapping Partners
  - Accurately Assess and Report Flood Risk
  - Meet Clients' Needs

8

MT-1 Completions per State between 10/01/2021 and 09/30/2022								
	Connecticut	Maine	Massachusetts	New Hampshire	New Jersey	New York	Rhode Island	Vermont
CLOMA	1	1	4	3	1	1	0	1
CLOMR-F	4	2	9	0	9	6	0	0
LOMA	157	210	281	185	253	522	21	77
LOMR-F	13	7	21	3	14	60	5	1
LOMR-FW	9	0	10	8	11	11	0	2
LOMR-VZ	2	4	4	0	0	1	2	0
Grand Total	186	224	329	199	288	601	28	81

MT-1 Completions per State between 10/01/2022 and 09/30/2023						
	Connecticut	Maine	Massachusetts	New Hampshire	Rhode Island	Vermont
CLOMA	3	0	4	2	0	1
CLOMR-F	6	1	11	1	0	0
LOMA	76	112	136	108	31	45
LOMR-F	16	2	21	5	3	6
LOMR-FW	3	0	3	4	0	2
LOMR-VZ	0	3	2	0	0	0
Grand Total	104	118	177	120	34	54

9

Map Update Methods

FEMA-Funded Updates:

- Study/Restudy
- Limited Map Maintenance Program (LMMP) Revision
  - A limited-scope restudy of flood hazards that generally involves a single community and one watercourse.
- Existing Data Study (XDS)
  - This term is used to describe the process by which FEMA uses previously published flood hazard information to prepare a Flood Insurance Study report and Flood Insurance Rate Map for a community that does not have a FIRM using previously published flood hazard information. This flood hazard information comes from reports prepared by Federal agencies for purposes other than the National Flood Insurance Program, such as Flood Hazard Analyses Reports and Floodplain Information reports; other engineering reports prepared by Federal, State, or local agencies; or Flood Insurance Study reports and maps issued by FEMA for adjacent communities (especially previously unincorporated areas of a county).

10

Map Update Methods

- Community/Property Owner-Initiated Amendments and Revisions:
  - Letters of Map Change (LOMCs)
    - Letter of Map Amendment (LOMA)
    - Letter of Map Revision – based on Fill (LOMR-F)
    - Letter of Map Revision (LOMR)
  - Physical Map Revisions (PMRs)

11

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

12

Why Use LOMC Process?

- Less costly and processing is faster than republishing DFIRM
- Scale limitations

13

LOMR

- Letter from FEMA that officially revises current flood map and FIS report to show changes to floodplains, floodways, flood elevations, and Flood Profiles
- A request that proposes updates to the flood map and FIS report is a Conditional Letter of Map Revision, or simply CLOMR
- Licensed engineers, not surveyors

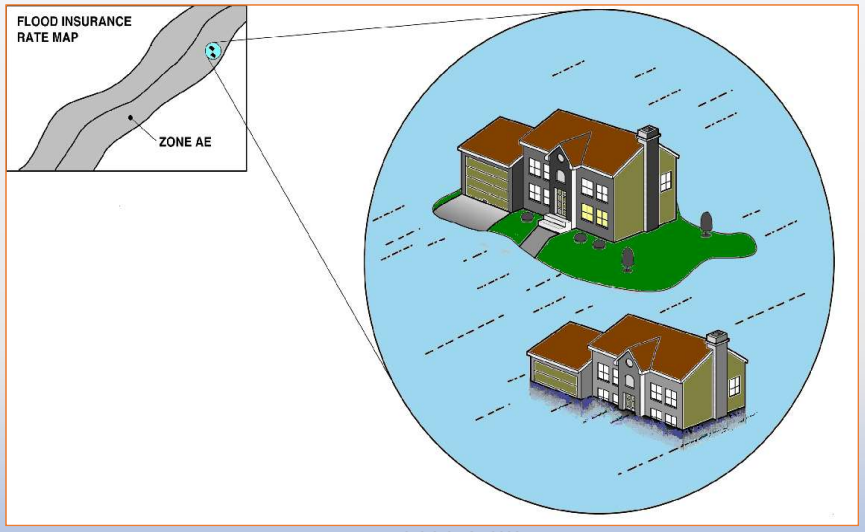
14

LOMA and LOMR-F

- Administrative procedure whereby FEMA reviews information submitted by property owner who believes that an existing structure or parcel of land has been inadvertently included in mapped SFHA:
  - A LOMA would apply to a structure or parcel of land on natural grade (not elevated by fill)
  - A LOMR-F would apply to a structure or parcel of land elevated by fill

15

LOMA or LOMR-F



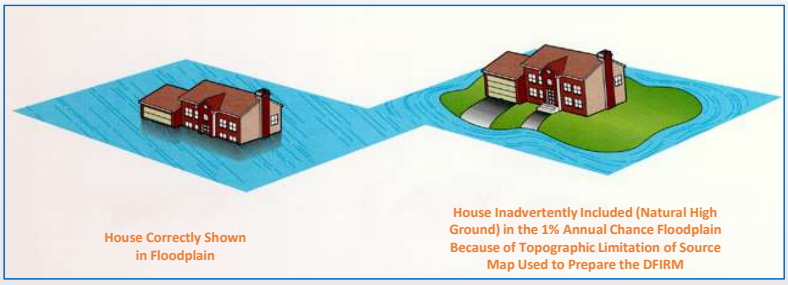
16

What Is a LOMA?

- Removal (by letter) of a specific parcel, portion of a parcel, and/or existing structure inadvertently shown within SFHA (no fill placed)
- Directly affect floodplain management and insurance rating
- Removes mandatory Federal flood insurance purchase requirement
- Processed under Part 70 – Procedure for Map Correction of NFIP regulations
- Does not change Base Flood Elevations (BFEs)

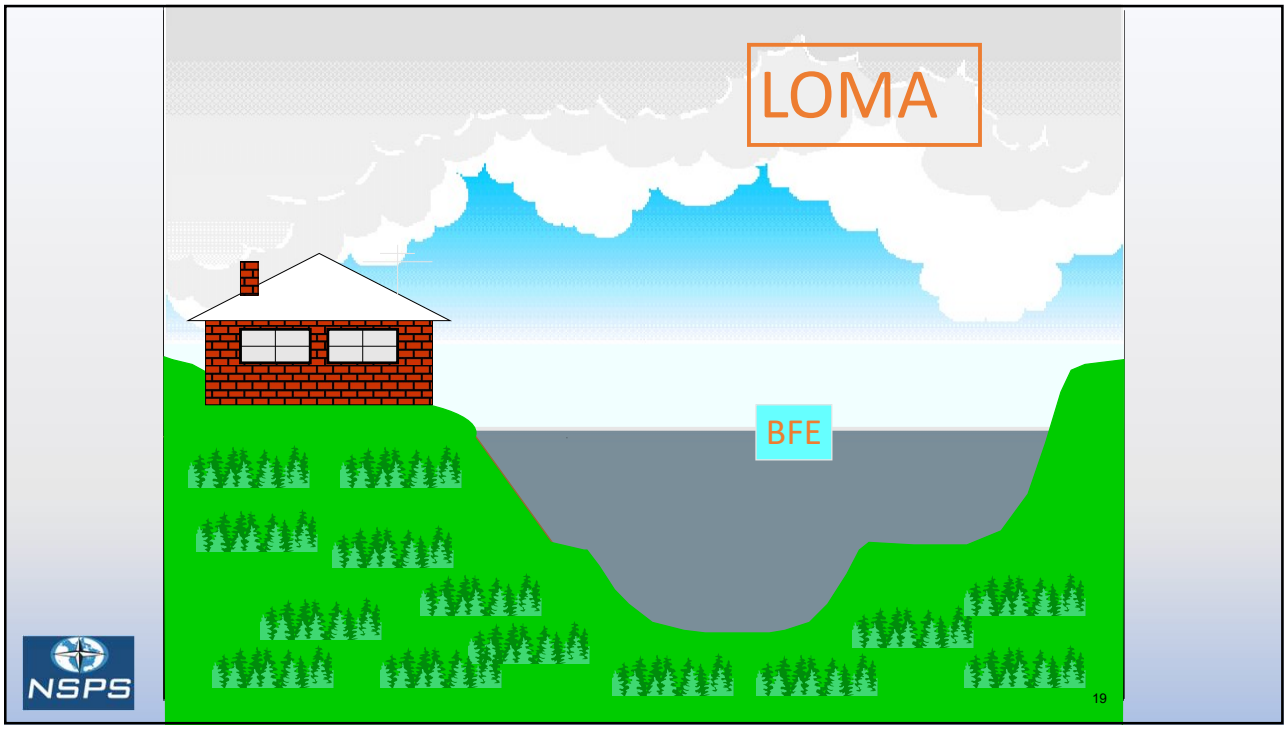
17

Criteria for LOMA



Part 70 of the NFIP Regulations requires that the lowest ground touching the structure be equal to or higher than the Base Flood Elevation (BFE)

18



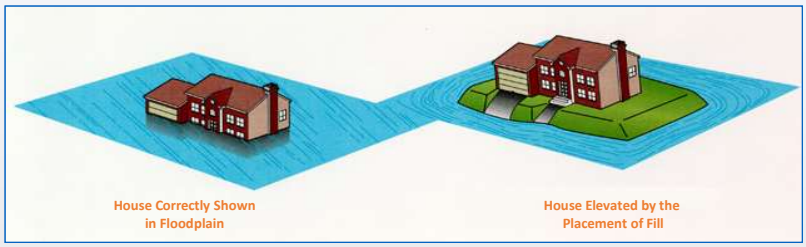
19

What is a LOMR-F?

- Removal (by letter) of a specific parcel, portion of a parcel, and/or existing structure elevated above the SFHA by earthen fill when:
  - Structure or parcel is outside SFHA
  - Structure or parcel is elevated above the SFHA
- Removes mandatory Federal flood insurance purchase requirement
- Processed under Section 65.5 Identification and Mapping of Special Flood Hazard Areas of NFIP regulations
- Does not change BFEs
- If the structure or parcel is currently mapped outside of the SFHA or fill was placed when the parcel or structure was outside of the SFHA, it will be treated as a LOMA.

20

Criteria for LOMR-F

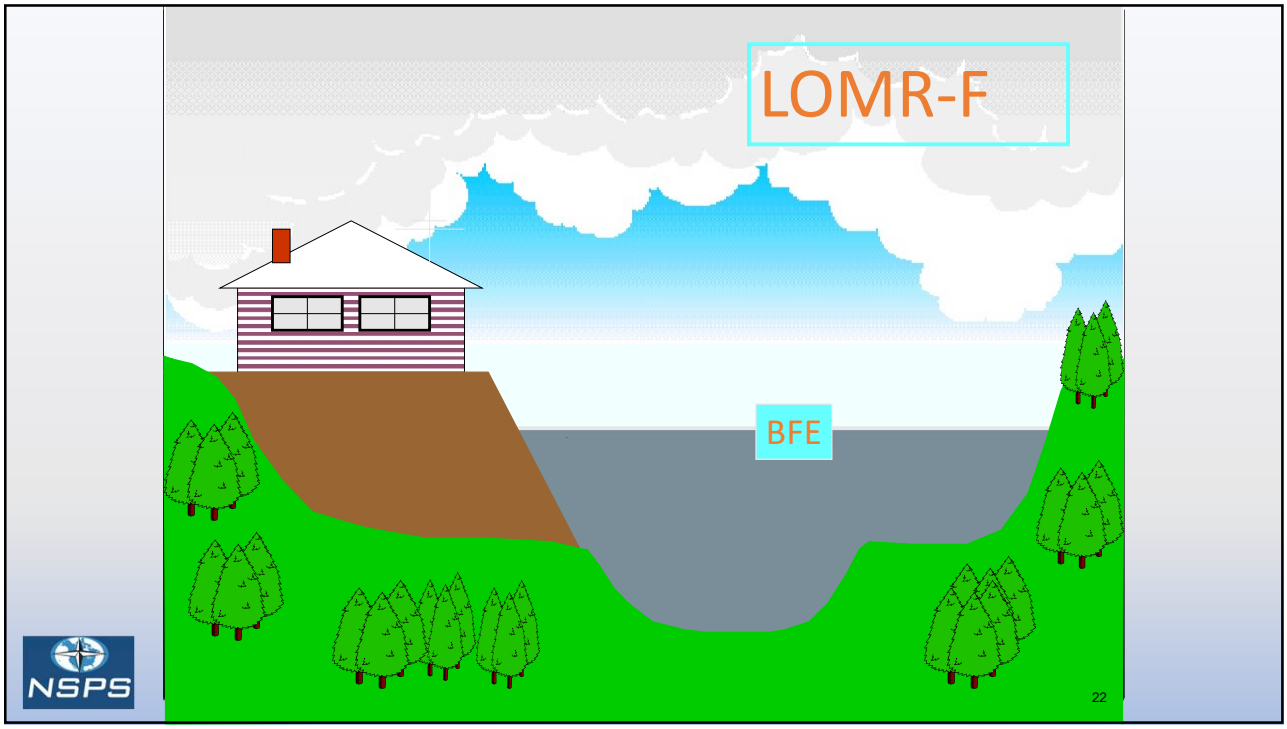


- Parts 60 and 65 of the NFIP regulations require that lowest ground touching structure be equal to or higher than BFE

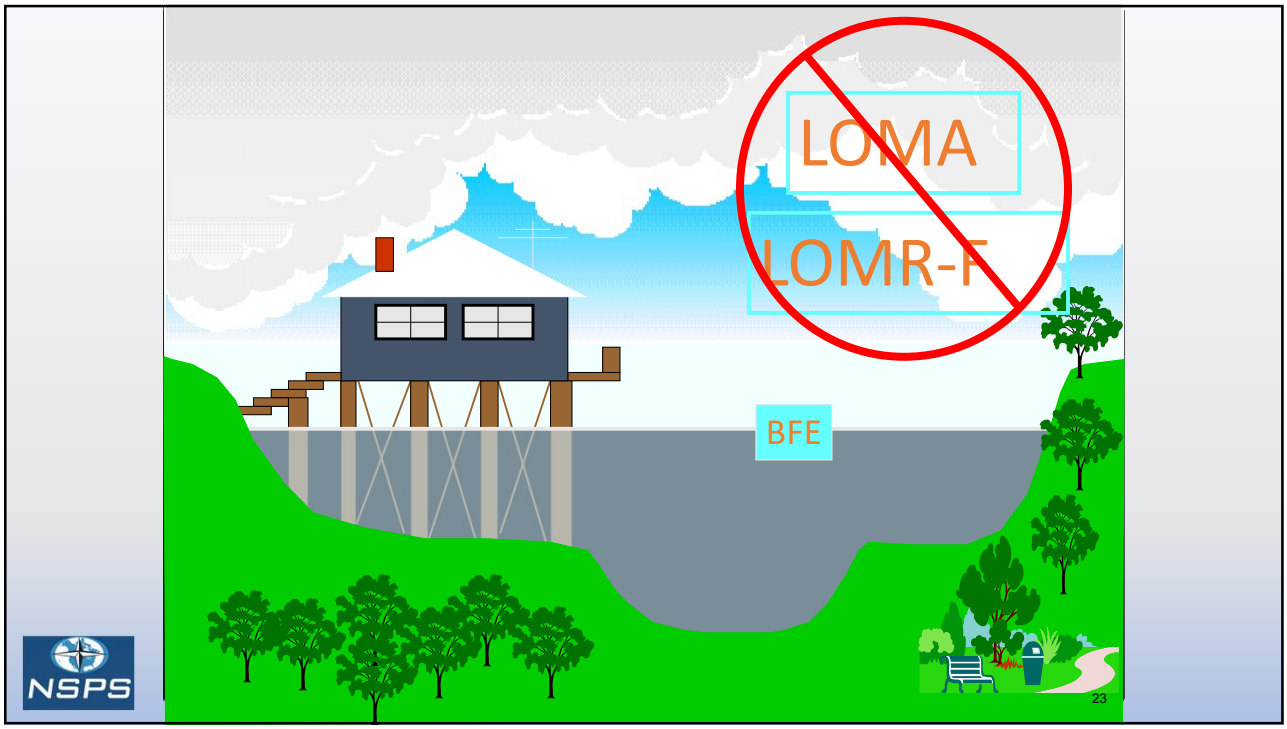
If structure is involved:

- LAG and lowest floor ≥ 1% annual chance flood elevation
- Community must sign the Community Acknowledgement form stating the structure is **"reasonably safe from flooding"**
- Fill typically is engineered to meet compaction and soil testing procedures

21



22



23

Conditional LOMR (CLOMR)

- Letter from FEMA commenting on whether proposed project, if built as proposed, would justify map revision or proposed hydrology changes
- Required in two situations:
  - 44 CFR 60.3(c)(10),(13) – where there is a BFE but no floodway, the cumulative effect of the existing and anticipated development cannot increase the water surface elevation of the base flood more than one foot at any point within the community ….. Or must apply for a CLOMR
  - 44 CFR 60.3(d)(3)(4) – no floodway encroachment can increase flood levels during the base flood discharge …. Or must apply for a CLOMR
- Does not revise flood map
- Within six (6) months of completion of the project a LOMR must be submitted to reflect the BFE and/or floodway modifications and officially revise the maps

24

Conditional LOMA or LOMR-F (CLOMA or CLOMR-F)

- FEMA's comment on proposed projects
- For an applicant proposing to build on property that is inadvertently included in SFHA or proposing to raise property above BFE using fill
- CLOMR-F applicants are responsible for documenting to FEMA compliance with the Endangered Species Act (ESA)
- Do not amend flood map

25

LOMA & 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
- A LOMR-F cannot be issued within the floodway

26

Determinations – Rounding

- All elevations for the LOMA or LOMR-F document are measured and referenced to nearest tenth of a foot, for example:

537.8’ remains 537.8’

537.87’ becomes 537.9’

539.95’ becomes 540.0’

27

Determinations – Rounding

- Determinations are based on rounded numbers:
  - Structure has LAG elevation of 537.87’ and BFE is 537.93’
    - While structure has LAG elevation lower than BFE, determination would be removal because LAG elevation rounds to 537.9’ and BFE rounds to 537.9’, thus elevations are the same

28

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **FEMA Policy #FP 204-078-1 (Rev 13) – November 2022**
- **https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping**
- **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.
- **198, 4/1/2003:** When processing a LOMC, any ongoing, past, or future map actions affecting the case shall be taken into consideration.
- **199, 2/28/2018 (Previously issued 4/1/2003):** LOMC submittals must include **certifications by a licensed professional authorized to certify the data under state law**, except when LiDAR is provided to satisfy the lowest adjacent grade (LAG) requirements for LOMAs.

29

FEMA POLICY Standards for 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.

30

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **218, 11/30/2019:** LOMA, CLOMA, LOMR-F, CLOMR-F, LOMR and CLOMR for a community **determinations must be issued based on the effective FIRM and FIS** 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).

31

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **553, 2/28/2018 (Previously issued 4/1/2003):** LOMCs shall be categorized on the SOMA as follows:
  - Category 1 (LOMCs Incorporated) - Includes those LOMRs (and some LOMAs and LOMR-Fs) whose results are unaffected by new or revised flood hazard data, and whose results can and will be incorporated into the revised FIRM panel(s). Large metes-and-bounds or multi-lot property removal LOMR-Fs are sometimes incorporated through Category 1 when scale limitations do not prohibit it; although typically, these LOMAs and LOMR-Fs will be revalidated through Category 2. Structure removal (both single and multiple determination) LOMCs cannot be incorporated due to scale limitations and therefore shall not be included in Category 1.
  - Category 2A (LOMCs Not incorporated on revised panels) - Includes those valid LOMCs that shall remain effective and / or are within the revised panel footprint of the study.

32

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **553, 2/28/2018 (Previously issued 4/1/2003):** LOMCs shall be categorized on the SOMA as follows:
  - Category 2B (LOMCs Not incorporated on unrevised panels) - Includes those valid LOMCs within a community that shall remain effective and / or fall on unrevised panels within that community.
  - Category 3 (LOMCs Superseded) - Includes those LOMCs whose results will not be reflected on the revised FIRM panel because the flood hazard data on which the determinations are based are being superseded by new detailed flood hazard data, or the information available was not sufficient to make a determination.
  - Category 4 (LOMCs To Be Redetermined) - Includes those LOMAs and LOMR-Fs issued for multiple lots or structures for which new determinations must be made because the determination for one or more properties or structures has changed as a result of the new or revised flood hazard information, and therefore cannot be revalidated.

33

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **613, 7/31/2015:** FEMA does not issue CLOMA or LOMA determinations in V zones where the primary frontal dunes (PFDs) define the inland limits of V zones.
- **614, 4/11/2019:** FEMA will only use BFEs in the format of the effective flood hazard map for (C)LOMA or (C)LOMR-F determinations where effective flood hazard areas are the result of coastal flood hazard analysis.
- **623, 11/30/2016:** Within **non-participating communities**, the Special Flood Hazard Area (SFHA) designation shall not be conditionally or effectively removed by letter from a structure or property that 1) has or will be elevated by the placement of fill, or 2) encroaches the regulatory floodway on the effective FIRM. This is because these reviews require the submission of a completed, signed, and dated Community Acknowledgement Form, which confirms compliance with the participating community's adopted floodplain management ordinance.

34

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **624, 11/30/2016:** The Special Flood Hazard Area (SFHA) designation shall not be conditionally or effectively removed from a structure or property by letter when the lowest adjacent grade to the structure or lowest point on the property is or would be below the applicable 1-percent-annual-chance flood elevation, **unless** certified data can be presented to demonstrate that naturally occurring intervening high ground exists between the structure or property and the source of flooding.

35

FEMA POLICY Standards for Flood Risk Analysis and Mapping

- **626, 11/30/2016:** The Special Flood Hazard Area designation may only be conditionally or effectively removed by letter from a property or portion-of-property that 1) includes the complete footprint of any proposed or existing structures impacted by the removal; and 2) does not include any flooding sources identified on the effective NFIP map.
- **627, 2/28/2018:** For Letters of Map Amendment (**LOMAs**), submitters may use **elevation data (typically LiDAR)** to document the **lowest adjacent grade** for a structure or lowest lot elevation for a parcel of land that complies with the USGS National Geospatial Program LiDAR Base Specification Quality Level 3 (QL3) or better and is provided by a federal, state or local government agency. [Guidance provided in Section 5.0 of MT-1 Technical Guidance, November 2022]

36

Questions?

37

NSPS Certified Floodplain Surveyor (CFS) Northeast Training and Certification Program

Module 7

Letters of Map Change (LOMC)
Forms Required for LOMA and LOMR-F Requests

October 31 - November 3, 2023

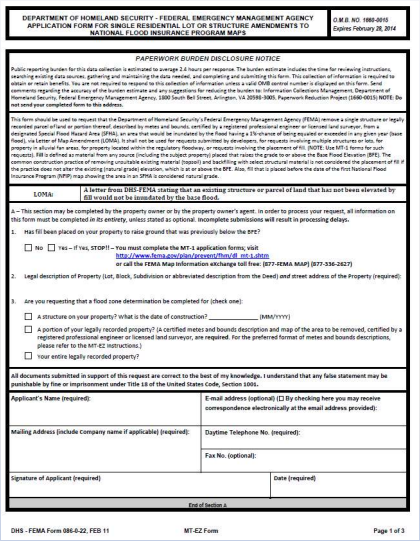
1

This module will…

- Describe Forms required to complete a LOMA or LOMR-F request and how to complete them
- Discuss Additional Data required for LOMA and LOMR-F requests
- Describe how to organize a case file and application package
- Provide an overview of LOMC Fees
- Discuss LOMC Revalidation
- Describe Common Problems with LOMA and LOMR-F requests

2

MT-EZ Form



DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
APPLICATION FORM FOR SINGLE RESIDENTIAL LOT OR STRUCTURE AMENDMENTS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 2.4 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. This collection of information is required to obtain or retain benefits. 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, 1800 South Bell Street, Arlington, VA 20598-3005. Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form should be used to request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) remove a single structure or legally recorded parcel of land or portion thereof, described by metes and bounds, certified by a registered professional engineer or licensed land surveyor, from a designated Special Flood Hazard Area (SFHA), an area that would be inundated by the flood having a 1%-chance of being equaled or exceeded in any given year (base flood), via Letter of Map Amendment (LOMA). It shall not be used for requests submitted by developers, for requests involving multiple structures or lots, for property in alluvial fan areas, for property located within the regulatory floodway, or requests involving the placement of fill. (NOTE: Use MT-1 forms for such requests). Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base 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. Also, fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in an SFHA is considered natural grade.

LOMA:	A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the base flood.

A – This section may be completed by the property owner or by the property owner's agent. In order to process your request, all information on this form must be completed *in its entirety*, unless stated as optional. Incomplete submissions will result in processing delays.

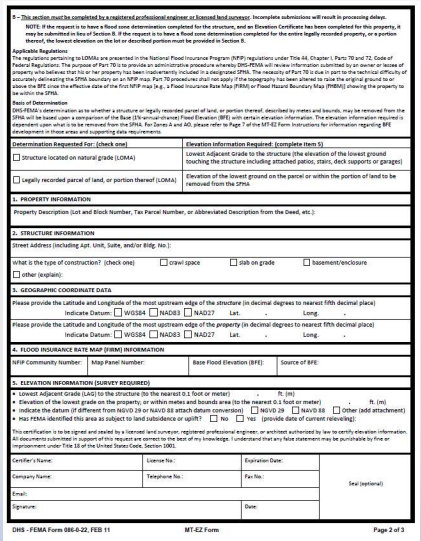
1. Has fill been placed on your property to raise ground that was previously below the BFE?
   ☐ No ☐ Yes – If Yes, **STOP!! – You must complete the MT-1 application forms, visit http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm or call the FEMA Map Information eXchange toll free: (877-FEMA MAP) (877-336-2627)**
2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed) and street address of the Property (required):
3. Are you requesting that a flood zone determination be completed for (check one):
   ☐ A structure on your property? What is the date of construction? _____ (MM/YYYY)
   ☐ A portion of your legally recorded property? (A certified metes and bounds description and map of the area to be removed, certified by a registered professional engineer or licensed land surveyor, are required. For the preferred format of metes and bounds descriptions, please refer to the MT-EZ instructions.)
   ☐ Your entire legally recorded property?

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required):	**E-mail address (optional) ☐ By checking here you may receive correspondence electronically at the email address provided):**
Mailing Address (include Company name if applicable) (required):	**Daytime Telephone No. (required):**
	Fax No. (optional):
Signature of Applicant (required)	**Date (required)**

End of Section A

DHS - FEMA Form 086-0-22, FEB 11 MT-EZ Form Page 1 of 3



B – This section must be completed by a registered professional engineer or licensed land surveyor. Incomplete submissions will result in processing delays.

NOTE: If the request is to have a flood zone determination completed for the structure, and an Elevation Certificate has been completed for this property, it may be submitted in lieu of Section B. If the request is to have a flood zone determination completed for the entire legally recorded property, or a portion thereof, the lowest elevation on the lot or described portion must be provided in Section B.

Applicable Regulations
The regulations pertaining to LOMAs are presented in the National Flood Insurance Program (NFIP) regulations under Title 44, Chapter I, Parts 70 and 72, Code of Federal Regulations. 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 his or her property has been inadvertently included in a designated SFHA. The necessity of Part 70 is due in part to the technical difficulty of accurately delineating the SFHA boundary on an NFIP map. 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 (e.g., a Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM)) showing the property to be within the SFHA.

Basis of Determination
DHS-FEMA's determination as to whether a structure or legally recorded parcel of land, or portion thereof, described by metes and bounds, may be removed from the SFHA will be based upon a comparison of the Base (1%-annual-chance) Flood Elevation (BFE) with certain elevation information. The elevation information required is dependent upon what is to be removed from the SFHA. For Zones A and AO, please refer to Page 7 of the MT-EZ Form Instructions for information regarding BFE development in those areas and supporting data requirements.

Determination Requested For: (check one)	**Elevation Information Required: (complete Item 5)**
☐ Structure located on natural grade (LOMA)	Lowest Adjacent Grade to the structure (the elevation of the lowest ground touching the structure including attached patios, stairs, deck supports or garages)
☐ Legally recorded parcel of land, or portion thereof (LOMA)	Elevation of the lowest ground on the parcel or within the portion of land to be removed from the SFHA

1. PROPERTY INFORMATION
Property Description (Lot and Block Number, Tax Parcel Number, or Abbreviated Description from the Deed, etc.):

2. STRUCTURE INFORMATION
Street Address (including Apt. Unit, Suite, and/or Bldg. No.):
What is the type of construction? (check one) ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☐ other (explain):

3. GEOGRAPHIC COORDINATE DATA
Please provide the Latitude and Longitude of the most upstream edge of the structure (in decimal degrees to nearest fifth decimal place)
Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .
Please provide the Latitude and Longitude of the most upstream edge of the property (in decimal degrees to nearest fifth decimal place)
Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .

4. FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

NFIP Community Number:	Map Panel Number:	Base Flood Elevation (BFE):	Source of BFE:

5. ELEVATION INFORMATION (SURVEY REQUIRED)
- Lowest Adjacent Grade (LAG) to the structure (to the nearest 0.1 foot or meter) . ft. (m)
- Elevation of the lowest grade on the property, or within metes and bounds area (to the nearest 0.1 foot or meter) . . ft. (m)
- Indicate the datum (if different from NGVD 29 or NAVD 88 attach datum conversion) ☐ NGVD 29 ☐ NAVD 88 ☐ Other (add attachment)
- Has FEMA identified this area as subject to land subsidence or uplift? ☐ No ☐ Yes (provide date of current relevelling):

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:	Seal (optional)
Company Name:	Telephone No.:	Fax No.:	
Email:			
Signature:		Date:	

DHS - FEMA Form 086-0-22, FEB 11 MT-EZ Form Page 2 of 3

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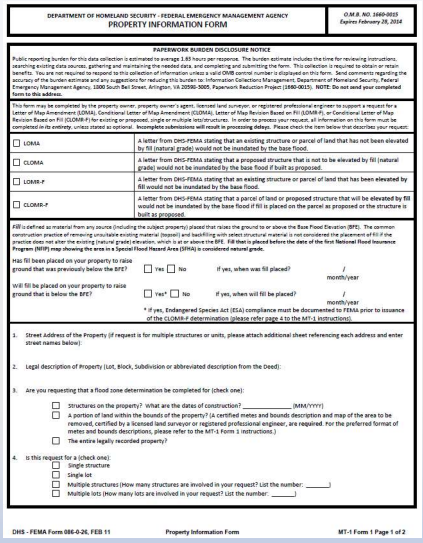
MT-1 - Property Information Form (PIF)



DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
PROPERTY INFORMATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.65 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005. Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form may be completed by the property owner, 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. In order to process your request, all information on this form must be completed *in its entirety*, unless stated as optional. **Incomplete submissions will result in processing delays.** Please check the item below that describes your request:

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

Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base 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 (SFHA) is considered natural grade.

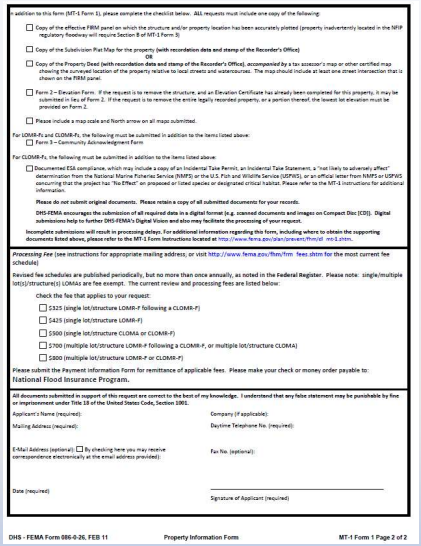
Has fill been placed on your property to raise ground that was previously below the BFE? ☐ Yes ☐ No If yes, when was fill placed? / month/year

Will fill be placed on your property to raise ground that is below the BFE? ☐ Yes* ☐ No If yes, when will fill be placed? / month/year

* If yes, Endangered Species Act (ESA) compliance must be documented to FEMA prior to issuance of the CLOMR-F determination (please refer page 4 to the MT-1 instructions).

1. Street Address of the Property (if request is for multiple structures or units, please attach additional sheet referencing each address and enter street names below):
2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed):
3. Are you requesting that a flood zone determination be completed for (check one):
   ☐ Structures on the property? what are the dates of construction? _____ (MM/YYYY)
   ☐ A portion of land within the bounds of the property? (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. For the preferred format of metes and bounds descriptions, please refer to the MT-1 Form 1 instructions.)
   ☐ The entire legally recorded property?
4. Is this request for a (check one):
   ☐ Single structure
   ☐ Single lot
   ☐ Multiple structures (How many structures are involved in your request? List the number: _____)
   ☐ Multiple lots (How many lots are involved in your request? List the number: _____)

DHS - FEMA Form 086-0-26, FEB 11 Property Information Form MT-1 Form 1 Page 1 of 2



In addition to this form (MT-1 Form 1), please complete the checklist below. ALL requests must include one copy of the following:

☐ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted (property inadvertently located in the NFIP regulatory floodway will require Section B of MT-1 Form 3)

☐ Copy of the Subdivision Plat Map for the property (with recordation data and stamp of the Recorder's Office)

OR

☐ Copy of the Property Deed (with recordation data and stamp of the Recorder's Office), *accompanied by* a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.

☐ Form 2 – Elevation Form. If the request is to remove the structure, and an Elevation Certificate has already been completed for this property, it may be submitted in lieu of Form 2. If the request is to remove the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2.

☐ Please include a map scale and North arrow on all maps submitted.

For LOMR-Fs and CLOMR-Fs, the following must be submitted in addition to the items listed above:
☐ Form 3 – Community Acknowledgment Form

For CLOMR-Fs, the following must be submitted in addition to the items listed above:

☐ Documented ESA compliance, which may include 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. Please refer to the MT-1 Instructions for additional information.

Please do not submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc (CD)). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-1 Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm.

Processing Fee (see instructions for appropriate mailing address; or visit http://www.fema.gov/fhm/frm_fees.shtm for the most current fee schedule)

Revised fee schedules are published periodically, but no more than once annually, as noted in the **Federal Register**. Please note: single/multiple lot(s)/structure(s) LOMAs are fee exempt. The current review and processing fees are listed below:

Check the fee that applies to your request:

☐ $325 (single lot/structure LOMR-F following a CLOMR-F)
☐ $425 (single lot/structure LOMR-F)
☐ $500 (single lot/structure CLOMA or CLOMR-F)
☐ $700 (multiple lot/structure LOMR-F following a CLOMR-F, or multiple lot/structure CLOMA)
☐ $800 (multiple lot/structure LOMR-F or CLOMR-F)

Please submit the Payment Information Form for remittance of applicable fees. Please make your check or money order payable to:
National Flood Insurance Program.

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required):	Company (if applicable):
Mailing Address (required):	Daytime Telephone No. (required):
E-Mail Address (optional): ☐ By checking here you may receive correspondence electronically at the email address provided):	Fax No. (optional):
Date (required)	Signature of Applicant (required)

DHS - FEMA Form 086-0-26, FEB 11 Property Information Form MT-1 Form 1 Page 2 of 2

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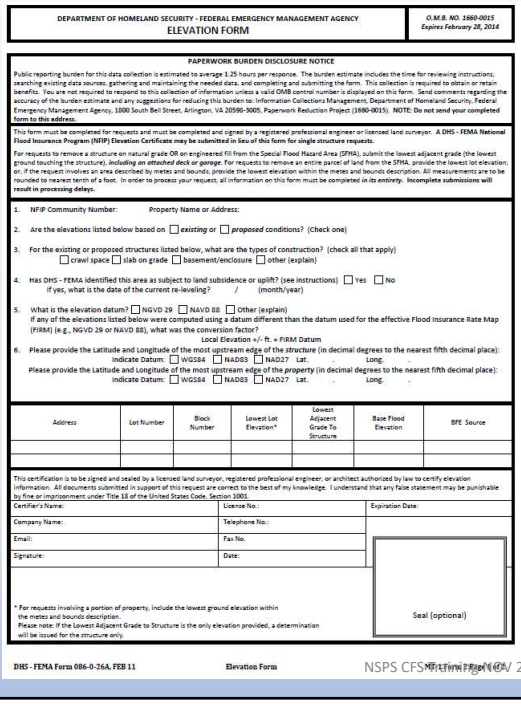

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.

For requests to remove a structure on natural grade OR on engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), *including an attached deck or garage*. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed *in its entirety*. Incomplete submissions will result in processing delays.

1. NFIP Community Number: Property Name or Address:
2. Are the elevations listed below based on ☐ *existing* or ☐ *proposed* conditions? (Check one)
3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☐ other (explain)
4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ☐ No
   If yes, what is the date of the current re-leveling? / (month/year)
5. What is the elevation datum? ☐ NGVD 29 ☐ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor?
   Local Elevation +/- ft. = FIRM Datum
6. Please provide the Latitude and Longitude of the most upstream edge of the *structure* (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .
   Please provide the Latitude and Longitude of the most upstream edge of the *property* (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:
Company Name:	Telephone No.:	
Email:	Fax No.	
Signature:	Date:	

Seal (optional)

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

DHS - FEMA Form 086-0-26A, FEB 11 Elevation Form MT-1 Form 1 Page 1 of 2

MT-1 Form
Page 1 of Elevation Form

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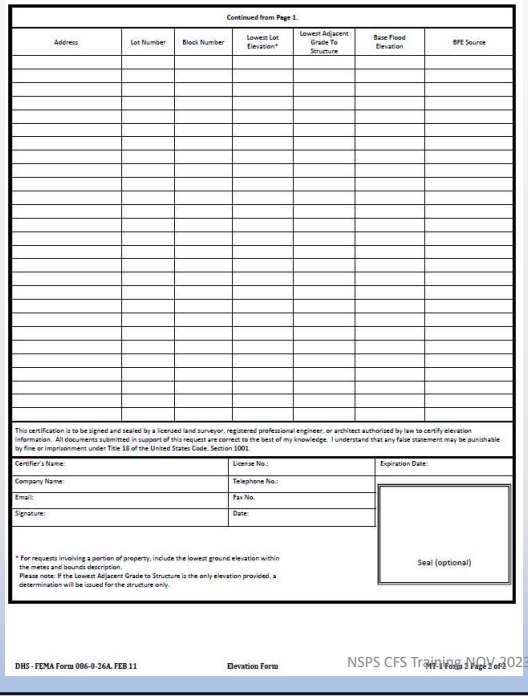

Continued from Page 1.

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:
Company Name:	Telephone No.:	
Email:	Fax No.	
Signature:	Date:	

Seal (optional)

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

DHS - FEMA Form 086-0-26A, FEB 11 Elevation Form MT-1 Form 2 Page 2 of 2

MT-1 Form
Page 2 of Elevation Form

- Submitted only in requests with multiple structures and/or parcels

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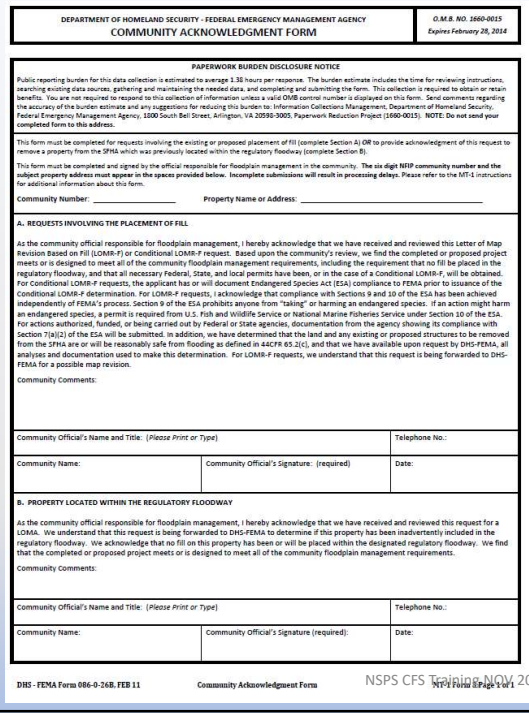

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) OR to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: _____ **Property Name or Address:** _____

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature: (required)	Date:

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

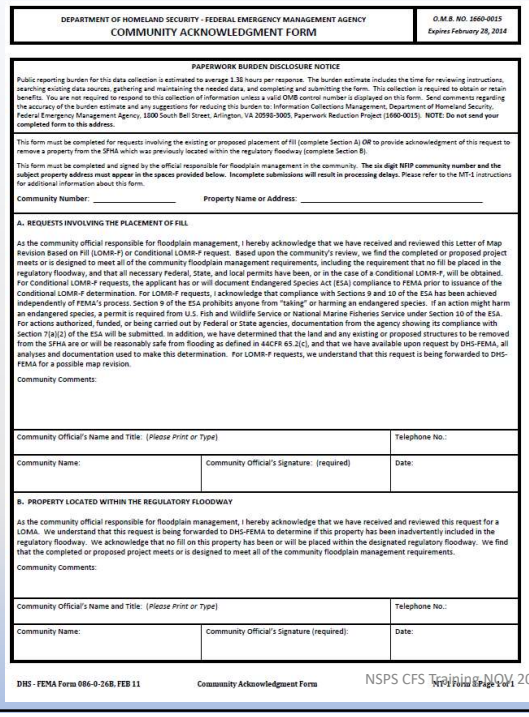
DHS - FEMA Form 086-0-26B, FEB 11 Community Acknowledgment Form MT-1 Form 8 Page 1 of 1

Community Acknowledgment Form

- Section A required for all requests involving fill
- Section B required if structure or parcel is inadvertently included in floodway

(If Section B is applicable, request must be submitted to the PTS Contractor for standard processing and issuance)

7



DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

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This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) OR to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: _____ **Property Name or Address:** _____

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature: (required)	Date:

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

DHS - FEMA Form 086-0-26B, FEB 11 Community Acknowledgment Form MT-1 Form 8 Page 1 of 1

MT-1 Form

Community Acknowledgment Form

- Section A required for all requests involving fill
- Section B required if structure or parcel is inadvertently included in floodway

8

Form Availability

- Forms are available from the FEMA Map Information eXchange (FMIX):
  - 1-877-FEMA MAP (1-877-336-2627)
  - Monday through Friday, 8:00 am through 6:30 pm ET
  - Self-service options are available 24/7
- Forms are also available online through FEMA's website:

https://www.fema.gov/flood-mapping-related-forms

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Which Form to use and when?

- *MT-EZ*: Structure is on natural ground, not on fill and/or "Out As Shown (OAS) See definition for fill. LOMA Application
- *MT-1:* Structure in built on fill or multiple structures. LOMR-F application

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Additional Data Requirements

- Copy of NFIP map indicating subject property location or structure plotted (certified with surveyor's seal and signature)
- Copy of legally recorded deed or plat map
- Certified metes and bounds description and map (if applicable)
- If deed, must include tax map.

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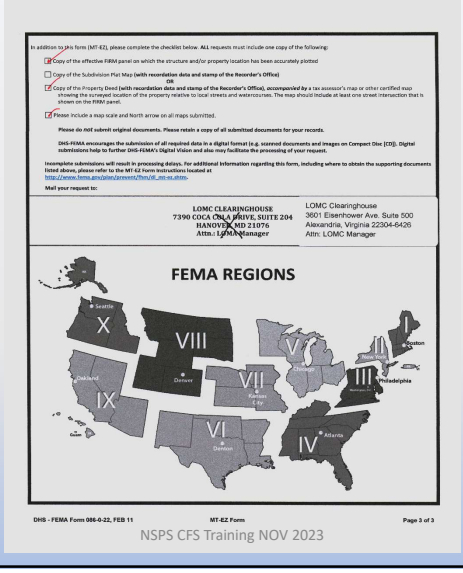
Last sheet MT-1 @ MT-EZ



In addition to this form (MT-EZ), please complete the checklist below. **ALL** requests must include one copy of the following:

☑ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted

☐ Copy of the Subdivision Plat Map **(with recordation data and stamp of the Recorder's Office)**

OR

☑ Copy of the Property Deed **(with recordation data and stamp of the Recorder's Office)**, ***accompanied by*** a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.

☑ Please include a map scale and North arrow on all maps submitted.

Please *do not* submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc (CD)). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-EZ Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-ez.shtm.

Mail your request to:

LOMC CLEARINGHOUSE
7390 COCA COLA DRIVE, SUITE 204
HANOVER, MD 21076
Attn.: LOMC Manager

LOMC Clearinghouse
3601 Eisenhower Ave. Suite 500
Alexandria, Virginia 22304-5426
Attn: LOMC Manager

FEMA REGIONS

DHS - FEMA Form 086-0-22, FEB 11 **MT-EZ Form** **Page 3 of 3**

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LOMA-OAS (out as shown)

- Cannot be on fill
- Applies to any structure that is completely out of the Special Flood Hazard Area
- Must include a GIS map or certified structure location map
- Expedited process.

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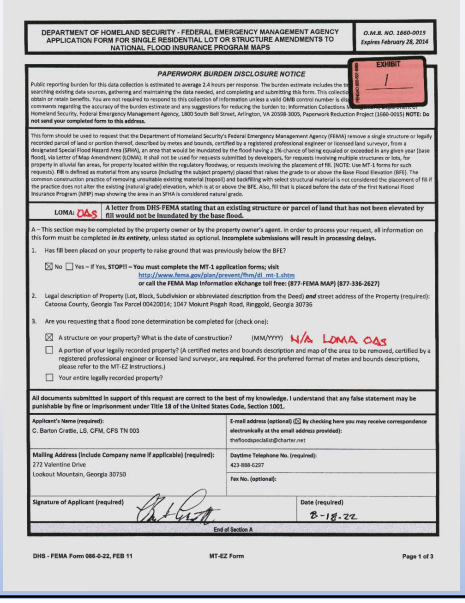
Completed MT-EZ OAS



DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
APPLICATION FORM FOR SINGLE RESIDENTIAL LOT OR STRUCTURE AMENDMENTS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

O.M.B. NO. 1660-0015
Expires February 28, 2014

EXHIBIT 1

PAPERWORK BURDEN DISCLOSURE NOTICE

LOMA: OAS A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the base flood.

A – This section may be completed by the property owner or by the property owner's agent. In order to process your request, all information on this form must be completed *in its entirety*, unless stated as optional. **Incomplete submissions will result in processing delays.**

1. Has fill been placed on your property to raise ground that was previously below the BFE?
☒ No ☐ Yes – If Yes, **STOP!!! – You must complete the MT-1 application forms; visit** http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm **or call the FEMA Map Information eXchange toll free: (877-FEMA MAP) (877-336-2627)**

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed) ***and*** street address of the Property (required): Catoosa County, Georgia Tax Parcel 0042001A; 1047 Mount Pisgah Road, Ringgold, Georgia 30736

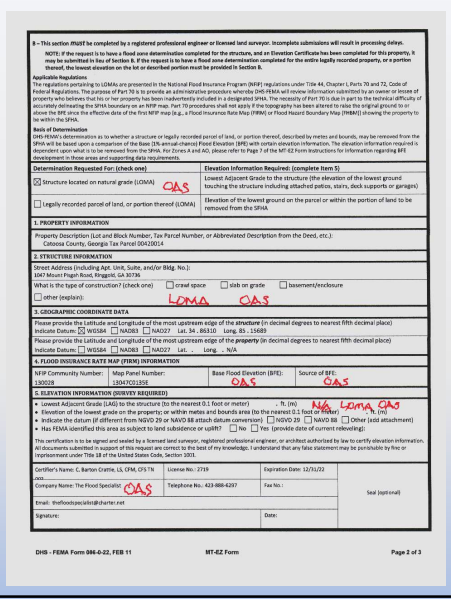
3. Are you requesting that a flood zone determination be completed for (check one):
☒ A structure on your property? What is the date of construction? (MM/YYYY) N/A LOMA OAS
☐ A portion of your legally recorded property? (A certified metes and bounds description and map of the area to be removed, certified by a registered professional engineer or licensed land surveyor, are **required.** For the preferred format of metes and bounds descriptions, please refer to the MT-EZ Instructions.)
☐ Your entire legally recorded property?

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required): C. Barton Crabbe, LS, CFM, CFS TN 003	E-mail address (optional): ☒ By checking here you may receive correspondence electronically at the email address provided: thefloodspecialist@charter.net
Mailing Address (Include Company name if applicable) (required): 272 Valentine Drive Lookout Mountain, Georgia 30750	Daytime Telephone No. (required): 423-888-6207 Fax No. (optional):
Signature of Applicant (required)	Date (required) 8-18-22

End of Section A

DHS - FEMA Form 086-0-22, FEB 11 MT-EZ Form Page 1 of 3



B – This section *must* be completed by a registered professional engineer or licensed land surveyor. Incomplete submissions will result in processing delays.

NOTE: If the request is to have a flood zone determination completed for the structure, and an Elevation Certificate has been completed for this property, it may be submitted in lieu of Section B. If the request is to have a flood zone determination completed for the entire legally recorded property, or a portion thereof, the lowest elevation on the lot or described portion must be provided in Section B.

Applicable Regulations
The regulations pertaining to LOMAs are presented in the National Flood Insurance Program (NFIP) regulations under Title 44, Chapter I, Parts 70 and 72, Code of Federal Regulations. 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 his or her property has been inadvertently included in a designated SFHA. The necessity of Part 70 is due in part to the technical difficulty of accurately delineating the SFHA boundary on an NFIP map. 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 (e.g., a Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM)) showing the property to be within the SFHA.

Basis of Determination
DHS-FEMA's determination as to whether a structure or legally recorded parcel of land, or portion thereof, described by metes and bounds, may be removed from the SFHA will be based upon a comparison of the Base (1% annual-chance) Flood Elevation (BFE) with certain elevation information. The elevation information required is dependent upon what is to be removed from the SFHA. For Zones A and AO, please refer to Page 7 of the MT-EZ Form Instructions for information regarding BFE development in those areas and supporting data requirements.

Determination Requested For: (check one)	Elevation Information Required: (complete Item 5)
☒ Structure located on natural grade (LOMA) OAS	Lowest Adjacent Grade to the structure (the elevation of the lowest ground touching the structure including attached patios, stairs, deck supports or garages)
☐ Legally recorded parcel of land, or portion thereof (LOMA)	Elevation of the lowest ground on the parcel or within the portion of land to be removed from the SFHA

1. PROPERTY INFORMATION
Property Description (Lot and Block Number, Tax Parcel Number, or Abbreviated Description from the Deed, etc.):
Catoosa County, Georgia Tax Parcel 0042001A

2. STRUCTURE INFORMATION
Street Address (including Apt. Unit, Suite, and/or Bldg. No.): 1047 Mount Pisgah Road, Ringgold, GA 30736
What is the type of construction? (check one) ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☐ other (explain): LOMA OAS

3. GEOGRAPHIC COORDINATE DATA
Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to nearest fifth decimal place) Indicate Datum: ☒ WGS84 ☐ NAD83 ☐ NAD27 Lat. 34 . 86110 Long. 85 . 15689
Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to nearest fifth decimal place) Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. . N/A

4. FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

NFIP Community Number: 130028	Map Panel Number: 13047C0135E	Base Flood Elevation (BFE): OAS	Source of BFE: OAS

5. ELEVATION INFORMATION (SURVEY REQUIRED)
- Lowest Adjacent Grade (LAG) to the structure (to the nearest 0.1 foot or meter) N/A LOMA OAS ft. (m)
- Elevation of the lowest grade on the property; or within metes and bounds area (to the nearest 0.1 foot or meter) ft. (m)
- Indicate the datum (if different from NGVD 29 or NAVD 88 attach datum conversion) ☐ NGVD 29 ☐ NAVD 88 ☐ Other (add attachment)
- Has FEMA identified this area as subject to land subsidence or uplift? ☐ No ☐ Yes (provide date of current rebeveling):

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: C. Barton Crattie, LS, CFM, CFS TN 003	License No.: 2719	Expiration Date: 12/31/22	Seal (optional)
Company Name: The Flood Specialist OAS	Telephone No.: 423-888-6297	Fax No.:	
Email: thefloodspecialist@charter.net			
Signature:		Date:	

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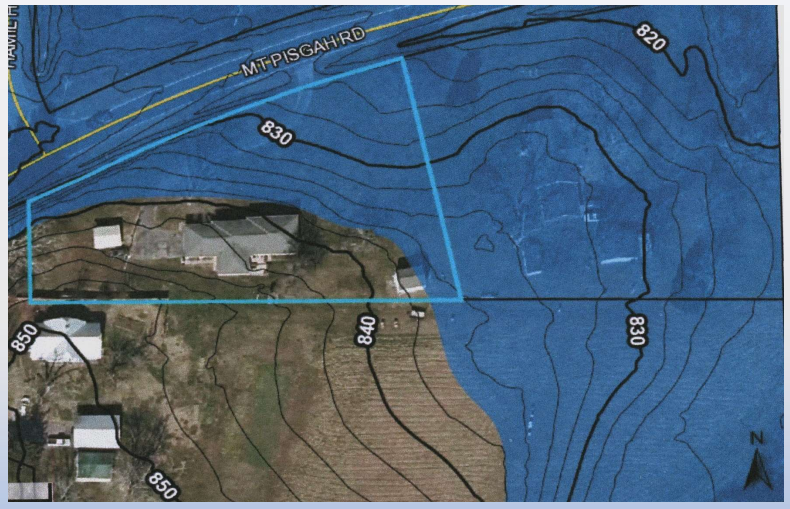
GIS Map



15

LOMR-F Data Requirements

- In addition to LOMR-F requirements:
  - Completed MT-1 Form 3 – Community Acknowledgement Form
  - Certified topographic map indicating original ground elevations and post-fill elevations (recommended). Only if the request is for a portion of the property.
  - Fees

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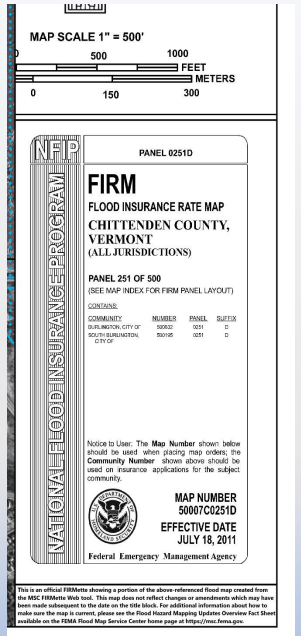
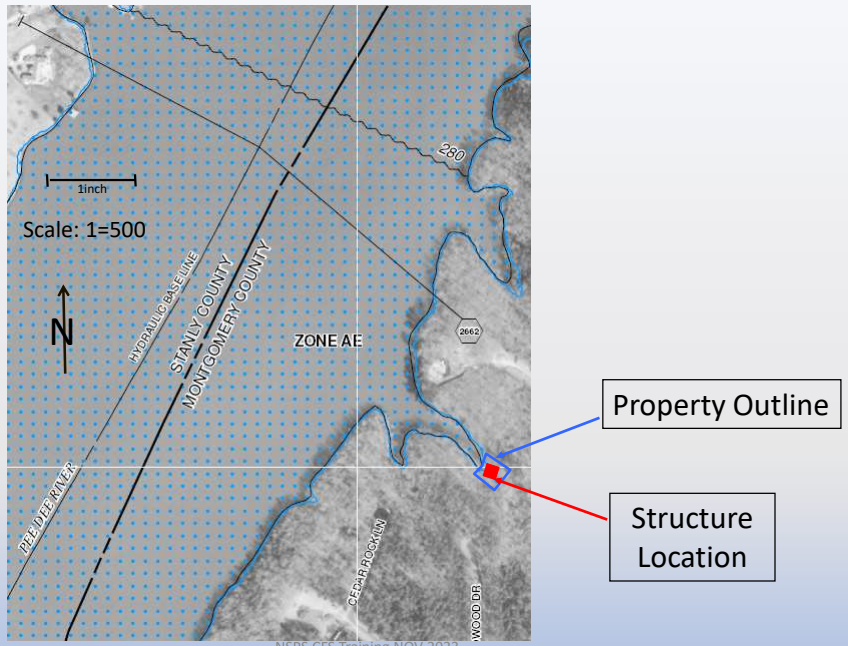
NFIP Map Requirements

- Annotated map panel must have property located and must be certified with surveyor's seal and signature
- Include copy of the map panel title block, including scale and North arrow
- Show flooding source name on map



17



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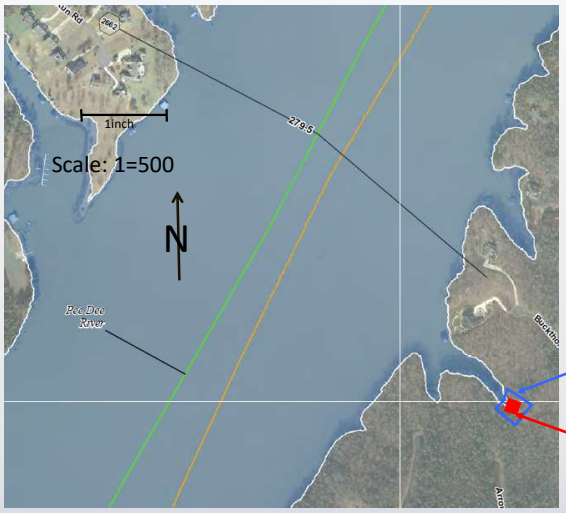

Property Outline

Structure Location

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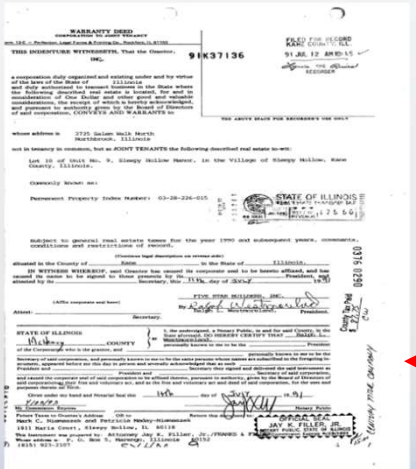
Legal Descriptions


WARRANTY DEED

91K37136

Legally Recorded Deed

- Can be based on recorded deed or recorded plat (see manual for example)

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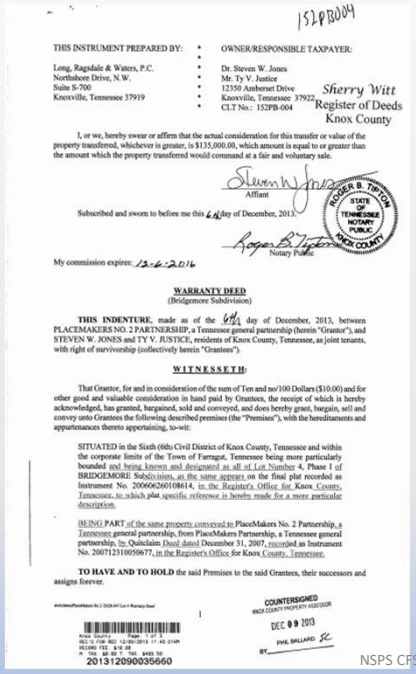
Legal Description from Deed



152PB004

THIS INSTRUMENT PREPARED BY:
Long, Ragsdale & Waters, P.C.
Northshore Drive, N.W.
Suite S-700
Knoxville, Tennessee 37919

OWNER/RESPONSIBLE TAXPAYER:
Dr. Steven W. Jones
Mr. Ty V. Justice
12350 Amberset Drive
Knoxville, Tennessee 37922
CLT No.: 152PB-004

Sherry Witt
Register of Deeds
Knox County

I, or we, hereby swear or affirm that the actual consideration for this transfer or value of the property transferred, whichever is greater, is $135,000.00, which amount is equal to or greater than the amount which the property transferred would command at a fair and voluntary sale.

Affiant

Subscribed and sworn to before me this 6th day of December, 2013.

ROGER B. TIPTON STATE OF TENNESSEE NOTARY PUBLIC KNOX COUNTY

Notary Public

My commission expires: 12-6-2016

WARRANTY DEED
(Bridgemore Subdivision)

THIS INDENTURE, made as of the 6th day of December, 2013, between PLACEMAKERS NO. 2 PARTNERSHIP, a Tennessee general partnership (herein "Grantor"), and STEVEN W. JONES and TY V. JUSTICE, residents of Knox County, Tennessee, as joint tenants, with right of survivorship (collectively herein "Grantees").

WITNESSETH:

That Grantor, for and in consideration of the sum of Ten and no/100 Dollars ($10.00) and for other good and valuable consideration in hand paid by Grantees, the receipt of which is hereby acknowledged, has granted, bargained, sold and conveyed, and does hereby grant, bargain, sell and convey unto Grantees the following described premises (the "Premises"), with the hereditaments and appurtenances thereto appertaining, to-wit:

SITUATED in the Sixth (6th) Civil District of Knox County, Tennessee and within the corporate limits of the Town of Farragut, Tennessee being more particularly bounded and being known and designated as all of Lot Number 4, Phase 1 of BRIDGEMORE Subdivision, as the same appears on the final plat recorded as Instrument No. 200606260108614, in the Register's Office for Knox County, Tennessee, to which plat specific reference is hereby made for a more particular description.

BEING PART of the same property conveyed to PlaceMakers No. 2 Partnership, a Tennessee general partnership, from PlaceMakers Partnership, a Tennessee general partnership, by Quitclaim Deed dated December 31, 2007, recorded as Instrument No. 200712310050677, in the Register's Office for Knox County, Tennessee.

TO HAVE AND TO HOLD the said Premises to the said Grantees, their successors and assigns forever.

COUNTERSIGNED
KNOX COUNTY PROPERTY ASSESSOR
DEC 09 2013
PHIL BALLARD
BY

201312090035660

Property instrument no. 200606260108614 added to Property no. #200712310050677, Bridgemore Subdivision, as described in a Warranty Deed in the Knox County Register's Office, Knox County, Tennessee

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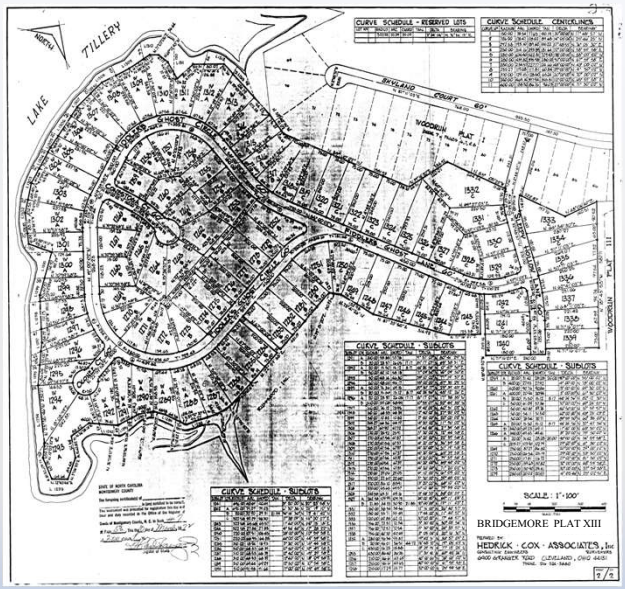
Example: Legal Description from Plat



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Data Requirements for Metes and Bounds

- Written description of portion of property at or above 1% annual chance flood elevation along with accompanying map (both must be certified)
- Certified lowest point elevation within metes and bounds parcel
- Metes and bounds must be a 'closed' description (having the same starting and ending points)

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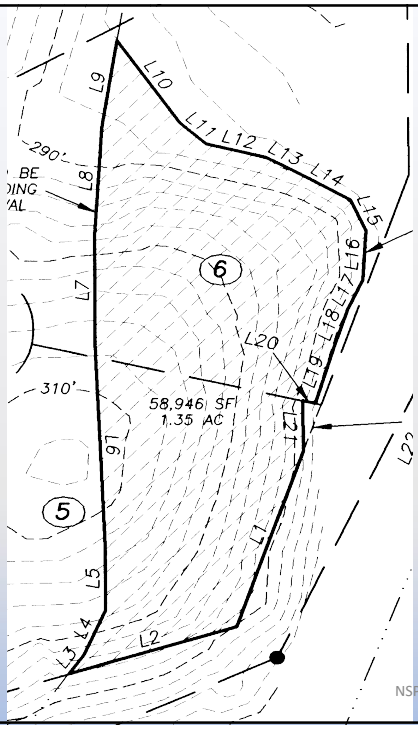

Metes and bounds map and description must be certified

LINE TABLE

LINE	DIRECTION	DISTANCE
L1	S 19°42'25" W	141.59'
L2	S 73°18'32" W	124.89'
L3	N 37°19'06" E	17.87'
L4	N 24°18'57" E	37.27'
L5	N 00°00'00" E	48.21'
L6	N 02°27'19" W	153.53'
L7	N 00°00'00" E	83.27'
L8	N 03°48'58" E	82.35'
L9	N 09°28'02" E	67.44'
L10	S 35°03'15" E	76.73'
L11	S 49°15'36" E	24.67'
L12	S 76°17'30" E	44.50'
L13	S 61°50'29" E	20.47'
L14	S 61°20'49" E	47.01'
L15	S 25°17'46" E	25.65'
L16	S 03°56'54" W	37.45'
L17	S 25°17'46" W	25.65'
L18	S 18°50'22" W	29.94'
L19	S 17°22'13" W	44.61'
L20	N 77°22'43" W	9.26'
L21	S 00°45'08" E	38.26'
L22	S 19°42'25" W	37.51'

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Metes and Bounds

- Descriptions are incorporated into Legal Property Description with phrase:
  - *"The portion of property is more particularly described by the following metes and bounds"*
- Example of Legal Property Description containing a metes and bounds is in the MT-1 instructions

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Metes and Bounds

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

Excerpt from MT-1 Instructions – Subject of Determination, page 7.

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Description Guidelines

Guidelines for writing Legal Property Descriptions

1. Do not copy the legal description directly from the recorded deed. Formats vary widely from community to community which is why FEMA requires the format described below be used for all eLOMAs.

2. Lot, Block, and Subdivision names should only be used for properties that are referred to using the standard Lot, Block, and Subdivision naming convention, e.g. Lot 8, Block C, Maple Acres.

3. Portions of lots are generally not depicted on recorded plats so if a property is described as a portion of a lot in a recorded deed then the Legal Property Description should refer to that recorded deed instead of the recorded plat.

4. If a property is not described by a Lot, Block, and Subdivision in the recorded deed but is described by a detailed metes and bounds, it is best to refer to the property as "A parcel of land, as described in..."

5. Properties are **described** in deeds and **shown** on plats.

6. Do not enter Legal Property Descriptions in all capital letters or all lower case letters (use appropriate capitalization).

7. Use the capitalization and punctuation that is detailed in the examples provided below.

8. If a deed or plat is recorded on more than one page refer to all of the pages in the Legal Property Description, not just the first one.

9. If a deed or plat is recorded with a Document Number or Instrument Number refer to that number along with any Book and Page information.

10. For those subdivisions that include Block and Section numbers (note: these 'Sections' are not the same as the ones in a Section, Township, Range) the Section number should be included in the Legal Property Description. An example would be 'Lot 1, Block B, Maple Acres, Section VII,..."

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Guidelines Continued

Steps for writing FEMA approved Legal Property Descriptions

1. Lot, Block, Subdivision, ... OR
   A portion of Section, Township, Range, Principal Meridian... OR
   A parcel of land,... (when there is no Lot, Block, Subdivision or Section/Township/Range/Principal Meridian information for the property)

2. as described in... (for deeds) OR
   as shown on... (for plats)

3. the (General Warranty, Joint Tenancy, Survivorship, Quit Claim, etc.) Deed... OR
   the Plat...

4. recorded as Document No. #, ... OR
   recorded as Document No. # in (Book or Liber) #, (Page(s) or Folio) #, (use "and" for 2-3 pages, "through" for 4 or more pages) ... OR
   recorded in (Book or Liber) #, (Page(s) or Folio) #, (use "and" for 2-3 pages, "through" fo or more pages) ...

5. in the Office of the (Recorder, or Register of Deeds, or County Clerk, or Clerk of Court, etc.), ...

6. City (use in place of the County only if the deed or plat is recorded in the city or town), ...

7. County/Parish, ...

8. State

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Common Problems with Metes and Bounds

- Map and written description do not match
- Topographic map indicates portion of metes and bounds below BFE
- Metes and bounds are not certified
- No tie-in to Point of Beginning
- Starting and ending points are not the same
- Metes and Bounds include flooding sources
- Metes and Bounds intersect with existing buildings
- Note: Metes and Bounds cannot follow and describe the SFHA Boundaries as they are subject to change

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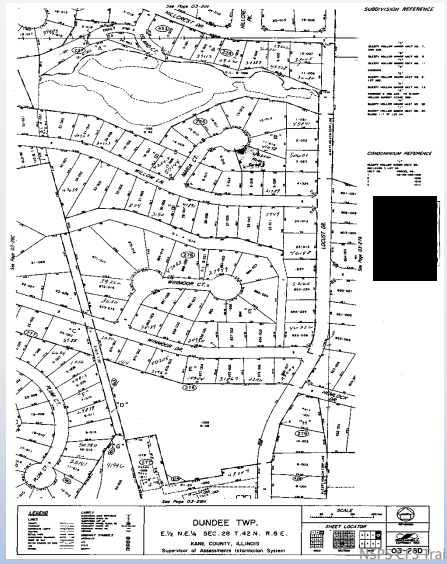
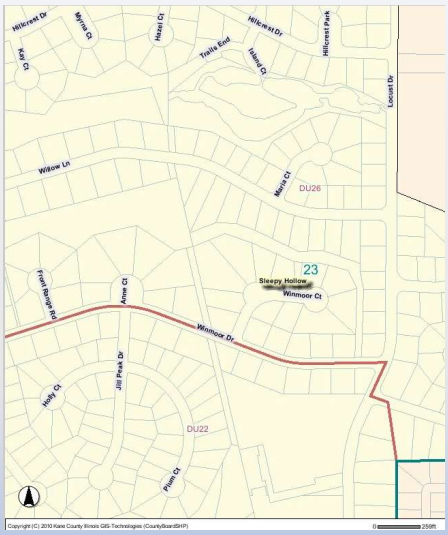
Sample Tax Map





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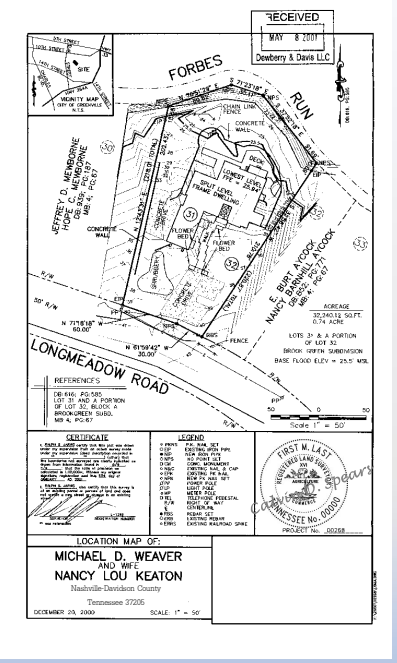
Survey and/or Site Plan

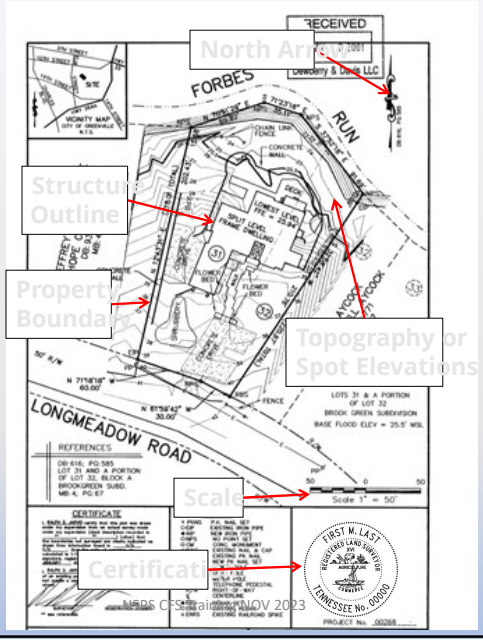
A certified map indicating structure location in relation to the property

- Required for all requests where property is located in floodway
- Must be certified
- Must include scale, North arrow, and vertical datum
- Will be referred to as a "Site Plan" during this course, the exam, and in all FEMA materials



31

Data Requirements for Site Plan



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Data Collection

Exhibit Num.	ITEM	Initial Submit Date	Date Requested	Date Received
	Property Information /MT-EZ form			
	Recorded Plat			
	Recorded Deed			
	Tax Assessor's Map or Similar Suitable Map			
	Effective FIRM or FHBM			
	Effective FBFM (Floodway)			
	Preliminary FIRM			
	Map Showing Structure Locations			
	Metes & Bounds Description			
	Metes & Bounds Map			
	Elevation Information Form or Certificate			
	Summary of Elevations/Lot Breakdown Form			
	Effective Profile			
	Floodway Data Table			
	Stillwater Elevations Table			
	Data Supporting the BFE			
	Topography/Countours/Grading Plan			
	Community Acknowledgement form			
	Fee ($_____)			
	Other Data: _____			
	_____			
	_____			

Submitted CFS case file should be organized according to Data Collection Table – example is in the instruction manual

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Table 2: Required Forms and Minimum Data Required by Letter

Forms[1]	CLOMA	CLOMR-F	LOMA	LOMR-F	LOMR-FW[2]	LOMR-VZ[3]
Property Information Form	Required	Required	Required	Required	Required	Required
Elevation Data[4]	Required[4]	Required[4]	Required[4]	Required[4]	Required[4]	Required[4]
Elevation Form (continuation)[5]	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[6]	Required[6]	Required[6]	Not Required	Required[6]	Not Required	Not Required
Additional Data	**CLOMA**	**CLOMR-F**	**LOMA**	**LOMR-F**	**LOMR-FW[4]**	**LOMR-VZ[5]**
Recorded Deed OR Recorded Plat	Not Required	Not Required	Required	Required	Required	Required
Tax Map[7]	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.
7 A tax map or other suitable map is needed to accurately show the location of the property.

 From - MT-1 Technical Guidance, NOV 2022

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Exercise: Case File Creation and Form Completion

35

This Lab Will . . .

- Introduce you to creating and organizing a case file
- Teach you how to complete MT-EZ Form, Elevation Form, and Property Information Form

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Case File Creation and Organization

- Collect necessary information
  - Completing a 'Case File Summary' will help you organize your information
  - 'Data Collection' table will help you inventory and arrange your submittal
- Make sure forms are complete (an exercise will follow)

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Case File Summary

Community Number: _____ Case Type: LOMA _____

Lot Type: Single _____ Multiple _____ LOMR-F_____

Name of CFS: _____

Date CFS Submitted: ___/___/___

Community: _____ County: _____ State: _____

Property Identifier: _____

CFS Telephone #: _____ Fax: _____

CFS Address: _____

Client Name: _____ Tel. Num.:_____ Fax: _____

Client Address: _____

Map Panel: _____

Date of Effective Map: ___/___/___ Fill Date: ___/___/___

Date of First NFIP Map Showing Property in SFHA (required for fill cases): ___/___/___

Flooding Source:_____ Detailed or Approximate

Revisions/FIS in Progress? Y N If yes, how does it affect property: _____

_____

Latitude and Longitude (000.000):_____ Datum:_____

Legal Description:_____

_____

_____

Comments: _____

_____

_____

_____

Topographic and Flooding Information

1. **Structure and Property Elevations** (for Multiple Structures refer to Summary of Elevations)
   Existing: _____ Proposed: _____
   Lowest Property: _____ Source: _____ Exhibit No._____
   Lowest Adjacent Grade: _____ Source: _____ Exhibit No._____
   Lowest Floor: _____ Source: _____ Exhibit No._____
2. **Flood Elevations** (for Multiple Lots refer to Summary of Elevations)
   1% Annual Chance Flood: _____ Source: _____Exhibit No._____
   0.2% Annual Chance Flood: _____ Source: _____ Exhibit No._____
3. **Elevation Datum:**
   BFE: _____ Property: _____ Conversion: _____

Determination

LOMA:
Structure-REM_____ Property-REM_____ Metes and Bound-REM_____
Structure-OAS_____ Property-OAS_____ Metes and Bound-OAS_____
LOMR-F:
Structure-REM_____ Property-REM_____ Metes and Bound-REM_____
Structure-OAS_____ Property-OAS_____ Metes and Bound-OAS_____

Resultant Flood Zone: _____

Additional Considerations

_____ Topography Altered by Fill?
_____ Is Any Portion of the Property in the Floodway?
_____ Inadvertent Inclusion in Floodway?
_____ Is the Property in Zone A?
_____ Is the Property Revised by LOMR? Date: _____
_____ Has the Property been Annexed since the date of the effective FIRM?

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Inventory those items that apply

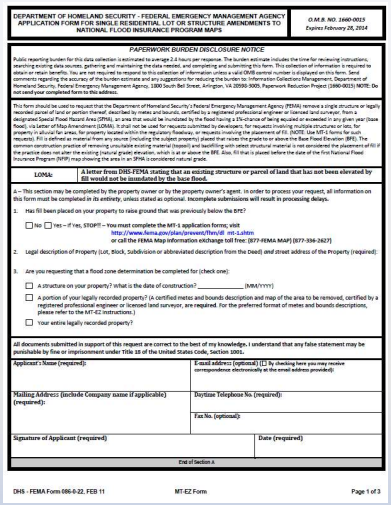
Data Collection

Exhibit Num.	ITEM	Initial Submit Date	Date Requested	Date Received
	Property Information /MT-EZ form			
	Recorded Plat			
	Recorded Deed			
	Tax Assessor's Map or Similar Suitable Map			
	Effective FIRM or FHBM			
	Effective FBFM (Floodway)			
	Preliminary FIRM			
	Map Showing Structure Locations			
	Metes & Bounds Description			
	Metes & Bounds Map			
	Elevation Information Form or Certificate			
	Summary of Elevations/Lot Breakdown Form			
	Effective Profile			
	Floodway Data Table			
	Stillwater Elevations Table			
	Data Supporting the BFE			
	Topography/Countours/Grading Plan			
	Community Acknowledgement form			
	Fee ($_____)			
	Other Data: _____			
	_____			
	_____			

MT-EZ Form

- Shortened version of the Property Information Form for cases that do not involve fill
- Contains requestor and elevation information
- Ideal for single properties, structures, or parcels
- May be complimented with Summary Table for multiple subjects

MT-EZ Form



DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
APPLICATION FORM FOR SINGLE RESIDENTIAL LOT OR STRUCTURE AMENDMENTS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 2.4 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. This collection of information is required to obtain or retain benefits. 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, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015) NOTE: Do not send your completed form to this address.

This form should be used to request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) remove a single structure or legally recorded parcel of land or portion thereof, described by metes and bounds, certified by a registered professional engineer or licensed land surveyor, from a designated Special Flood Hazard Area (SFHA), an area that would be inundated by the flood having a 1%-chance of being equaled or exceeded in any given year (base flood), via Letter of Map Amendment (LOMA). It shall not be used for requests submitted by developers; for requests involving multiple structures or lots; for property in alluvial fan areas; for property located within the regulatory floodway; or requests involving the placement of fill. (NOTE: Use MT-1 forms for such requests). Fill is defined as material from any source (including the subject property) placed that raises the grade to or above the Base 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. Also, fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in an SFHA is considered natural grade.

LOMA: A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the base flood.

A – This section may be completed by the property owner or by the property owner's agent. In order to process your request, all information on this form must be completed in its entirety, unless stated as optional. Incomplete submissions will result in processing delays.

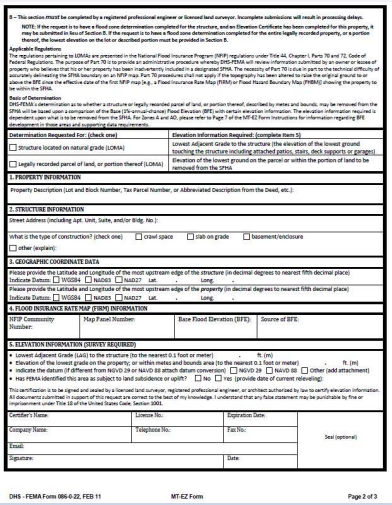
1. Has fill been placed on your property to raise ground that was previously below the BFE?
   ☐ No ☐ Yes – If Yes, STOP!! – You must complete the MT-1 application forms; visit http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm or call the FEMA Map Information eXchange toll free: (877-FEMA MAP) (877-336-2627)
2. Legal description of property (Lot, Block, Subdivision or abbreviated description from the Deed) *and* street address of the Property (required):
3. Are you requesting that a flood zone determination be completed for (check one):
   ☐ A structure on your property? What is the date of construction? _____ (MM/YYYY)
   ☐ A portion of your legally recorded property? (A certified metes and bounds description and map of the area to be removed, certified by a registered professional engineer or licensed land surveyor, are required. For the preferred format of metes and bounds descriptions, please refer to the MT-EZ instructions.)
   ☐ Your entire legally recorded property?

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required):	E-mail address (optional) ☐ By checking here you may receive correspondence electronically at the email address provided:
Mailing Address (include Company name if applicable) (required):	Daytime Telephone No. (required):
	Fax No. (optional):
Signature of Applicant (required)	Date (required)

End of Section A

DHS - FEMA Form 086-0-22, FEB 11 MT-EZ Form Page 1 of 3



B – This section must be completed by a registered professional engineer or licensed land surveyor. Incomplete submissions will result in processing delays.

NOTE: If the request is to have a flood zone determination completed for the structure, and an Elevation Certificate has been completed for this property, it may be submitted in lieu of Section B. If the request is to have a flood zone determination completed for the entire legally recorded property, or a portion thereof, the lowest elevation on the lot or described portion must be provided in Section B.

Applicable Regulations
The regulations pertaining to LOMAs are presented in the National Flood Insurance Program (NFIP) regulations under Title 44, Chapter I, Parts 70 and 72, Code of Federal Regulations. 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 his or her property has been inadvertently included in a designated SFHA. The necessity of Part 70 is due in part to the technical difficulty of accurately delineating the SFHA boundary on an NFIP map. 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 (e.g., a Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM)) showing the property to be within the SFHA.

Basis of Determination
DHS-FEMA's determination as to whether a structure or legally recorded parcel of land, or portion thereof, described by metes and bounds, may be removed from the SFHA will be based upon a comparison of the Base (1%-annual-chance) Flood Elevation (BFE) with certain elevation information. The elevation information required is dependent upon what is to be removed from the SFHA. For Zones A and AO, please refer to Page 7 of the MT-EZ Form Instructions for information regarding BFE development in those areas and supporting data requirements.

Determination Requested For: (check one)	Elevation Information Required: (complete item 5)
☐ Structure located on natural grade (LOMA)	Lowest Adjacent Grade to the structure (the elevation of the lowest ground touching the structure including attached patios, stairs, deck supports or garages)
☐ Legally recorded parcel of land, or portion thereof (LOMA)	Elevation of the lowest ground on the parcel or within the portion of land to be removed from the SFHA

1. PROPERTY INFORMATION

Property Description (Lot and Block Number, Tax Parcel Number, or Abbreviated Description from the Deed, etc.):

2. STRUCTURE INFORMATION

Street Address (including Apt. Unit, Suite, and/or Bldg. No.):

What is the type of construction? (check one) ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☐ other (explain):

3. GEOGRAPHIC COORDINATE DATA

Please provide the Latitude and Longitude of the most upstream edge of the structure (in decimal degrees to nearest fifth decimal place)
Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat: . Long: .
Please provide the Latitude and Longitude of the most upstream edge of the property (in decimal degrees to nearest fifth decimal place)
Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat: . Long: .

4. FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

NFIP Community Number:	Map Panel Number:	Base Flood Elevation (BFE):	Source of BFE:

5. ELEVATION INFORMATION (SURVEY REQUIRED)

- Lowest Adjacent Grade (LAG) to the structure (to the nearest 0.1 foot or meter) . ft. (m)
- Elevation of the lowest grade on the property, or within metes and bounds area (to the nearest 0.1 foot or meter) . ft. (m)
- Indicate the datum (if different from NGVD 29 or NAVD 88 attach datum conversion) ☐ NGVD 29 ☐ NAVD 88 ☐ Other (add attachment)
- Has FEMA-identified this area as subject to land subsidence or uplift? ☐ No ☐ Yes (provide date of current retleveling):

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:	
Company Name:	Telephone No.:	Fax No.:	Seal (optional)
Email:			
Signature:		Date:	

DHS - FEMA Form 086-0-22, FEB 11 MT-EZ Form Page 2 of 3

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Property Information Form: MT-1 Form 1

- Type of request (LOMA or LOMR-F)
- Information unique to the property is requested
- Identifies items needed to process a LOMA or LOMR-F
- Fees, if applicable
- Requester's signature is required

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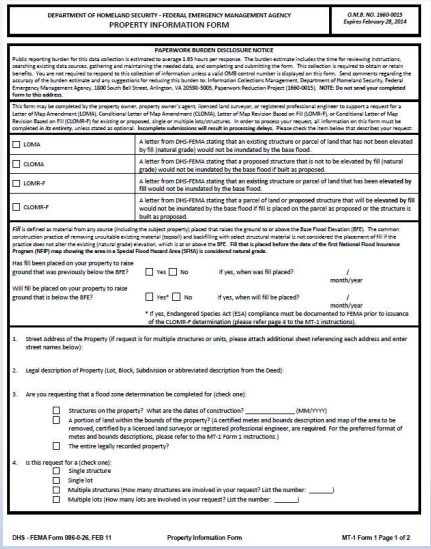
Property Information Form (PIF)



DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
PROPERTY INFORMATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.65 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form may be completed by the property owner, 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. In order to process your request, all information on this form must be completed in its entirety, unless stated as optional. Incomplete submissions will result in processing delays. Please check the item below that describes your request:

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

Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base 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 (SFHA) is considered natural grade.**

Has fill been placed on your property to raise ground that was previously below the BFE? ☐ Yes ☐ No If yes, when was fill placed? ___/___ month/year

Will fill be placed on your property to raise ground that is below the BFE? ☐ Yes* ☐ No If yes, when will fill be placed? ___/___ month/year

* If yes, Endangered Species Act (ESA) compliance must be documented to FEMA prior to issuance of the CLOMR-F determination (please refer page 6 to the MT-1 instructions).

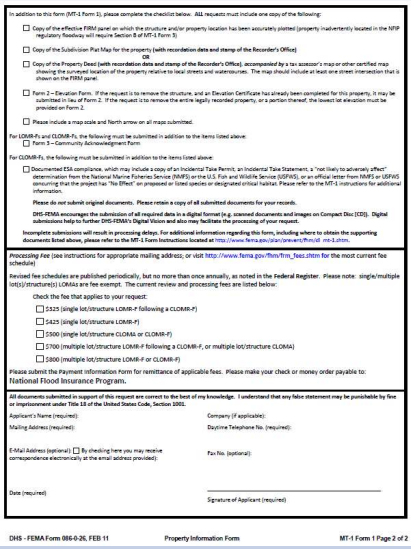
1. Street Address of the Property (If request is for multiple structures or units, please attach additional sheet referencing each address and enter street names below):

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed):

3. Are you requesting that a flood zone determination be completed for (check one):
   - ☐ Structures on the property? what are the dates of construction? _____ (MM/YYYY)
   - ☐ A portion of land within the bounds of the property? (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. For the preferred format of metes and bounds descriptions, please refer to the MT-1 Form 1 instructions.)
   - ☐ The entire legally recorded property?

4. Is this request for a (check one):
   - ☐ Single structure
   - ☐ Single lot
   - ☐ Multiple structures (How many structures are involved in your request? List the number: _____)
   - ☐ Multiple lots (How many lots are involved in your request? List the number: _____)

DHS - FEMA Form 086-0-26, FEB 11 Property Information Form MT-1 Form 1 Page 1 of 2



In addition to this form (MT-1 Form 1), please complete the checklist below. ALL requests must include one copy of the following:

- ☐ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted (property inadvertently located in the NFIP regulatory floodway will require Section B of MT-1 Form 3)
- ☐ Copy of the Subdivision Plat Map for the property (with recordation data and stamp of the Recorder's Office)
  OR
- ☐ Copy of the Property Deed (with recordation data and stamp of the Recorder's Office), accompanied by a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.
- ☐ Form 2 – Elevation Form. If the request is to remove the structure, and an Elevation Certificate has already been completed for this property, it may be submitted in lieu of Form 2. If the request is to remove the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2.
- ☐ Please include a map scale and North arrow on all maps submitted.

For LOMR-Fs and CLOMR-Fs, the following must be submitted in addition to the items listed above:
- ☐ Form 3 – Community Acknowledgment Form

For CLOMR-Fs, the following must be submitted in addition to the items listed above:
- ☐ Documented ESA compliance, which may include 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. Please refer to the MT-1 instructions for additional information.

Please do not submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc [CD]). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-1 Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm.

Processing Fee (see instructions for appropriate mailing address; or visit http://www.fema.gov/fhm/frm_fees.shtm for the most current fee schedule)

Revised fee schedules are published periodically, but no more than once annually, as noted in the **Federal Register**. Please note: single/multiple lot(s)/structure(s) LOMAs are fee exempt. The current review and processing fees are listed below:

Check the fee that applies to your request:
- ☐ $325 (single lot/structure LOMR-F following a CLOMR-F)
- ☐ $425 (single lot/structure LOMR-F)
- ☐ $500 (single lot/structure CLOMA or CLOMR-F)
- ☐ $700 (multiple lot/structure LOMR-F following a CLOMR-F, or multiple lot/structure CLOMA)
- ☐ $800 (multiple lot/structure LOMR-F or CLOMR-F)

Please submit the Payment Information Form for remittance of applicable fees. Please make your check or money order payable to: **National Flood Insurance Program.**

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required): Company (if applicable):

Mailing Address (required): Daytime Telephone No. (required):

E-Mail Address (optional) ☐ By checking here you may receive correspondence electronically at the email address provided: Fax No. (optional):

Date (required) Signature of Applicant (required)

DHS - FEMA Form 086-0-26, FEB 11 Property Information Form MT-1 Form 1 Page 2 of 2

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Elevation Form: MT-1 Form 2

- Type of construction for building is requested
- Elevation datum is required
- Can be used for single or multiple properties, structures, or parcels
- Certification is required

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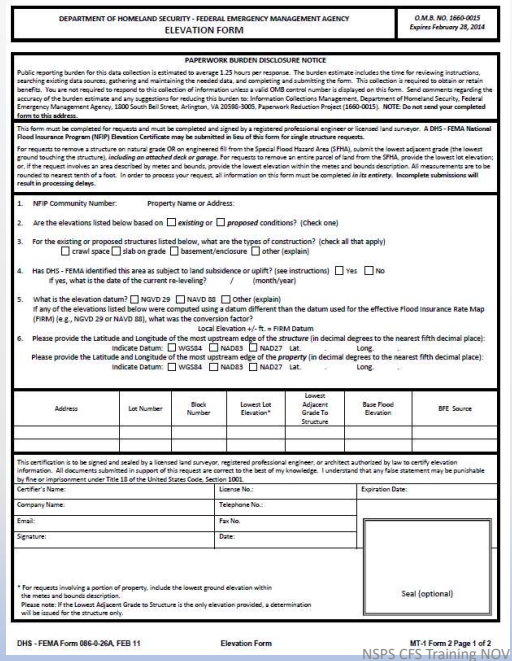

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005. Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.

For requests to remove a structure on natural grade OR an engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), *including an attached deck or garage*. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed *in its entirety*. Incomplete submissions will result in processing delays.

1. NFIP Community Number: Property Name or Address:
2. Are the elevations listed below based on ☐ *existing* or ☐ *proposed* conditions? (Check one)
3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☐ other (explain)
4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ☐ No
   If yes, what is the date of the current re-leveling? / (month/year)
5. What is the elevation datum? ☐ NGVD 29 ☐ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor?
   Local Elevation +/- ft. = FIRM Datum
6. Please provide the Latitude and Longitude of the most upstream edge of the *structure* (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. Long.
   Please provide the Latitude and Longitude of the most upstream edge of the *property* (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. Long.

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:
Company Name:	Telephone No.:	
Email:	Fax No.	
Signature:	Date:	

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

DHS - FEMA Form 086-0-26A, FEB 11 Elevation Form MT-1 Form 2 Page 1 of 2

Elevation Form

(an Elevation Certificate may also be substituted)

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Exercise: Forms Completion

- Using information provided in the following example survey and the bulleted items below, complete the MT-EZ Form and Elevation Form
  - No fill was placed at the site
  - Structure is located in Zone AE (not near floodway)
  - Property is located within the Floodville Town Limits
  - Slab on grade construction (as-built) and deck is attached to the structure
  - Complete forms as if you are applicant or property owner
  - BFE is 245.0 feet, which was derived from the FIS Flood Profile
  - Lat & Long coordinates are 36.08192, -78.89225 (NAD83)

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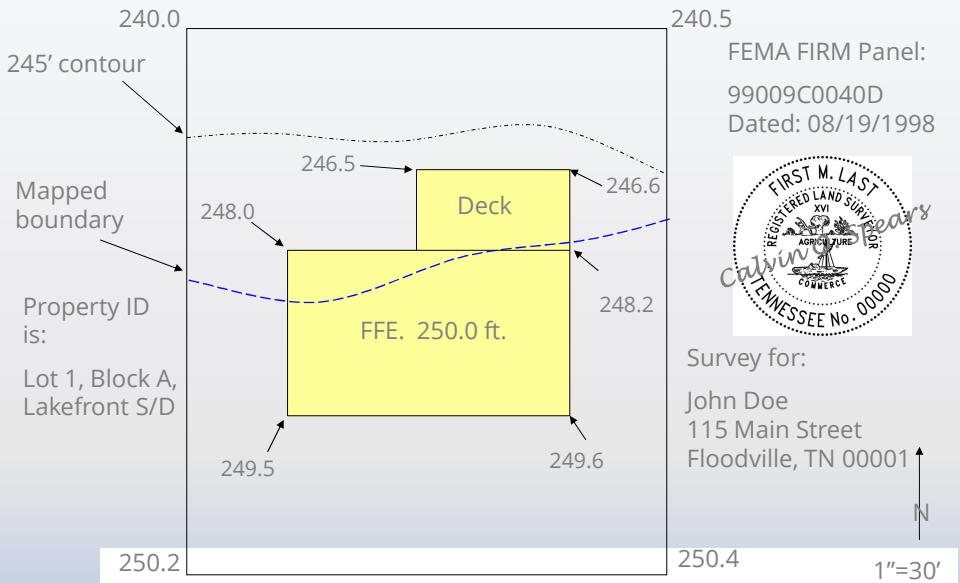

NSPS CFS Training NOV 2023 47

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Review Answers

NSPS CFS Training NOV 2023 48

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LOMC Fees

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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

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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).

HFIAA Exemptions

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 (CLOMR-F and LOMR-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: https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees

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LOMC Revalidation

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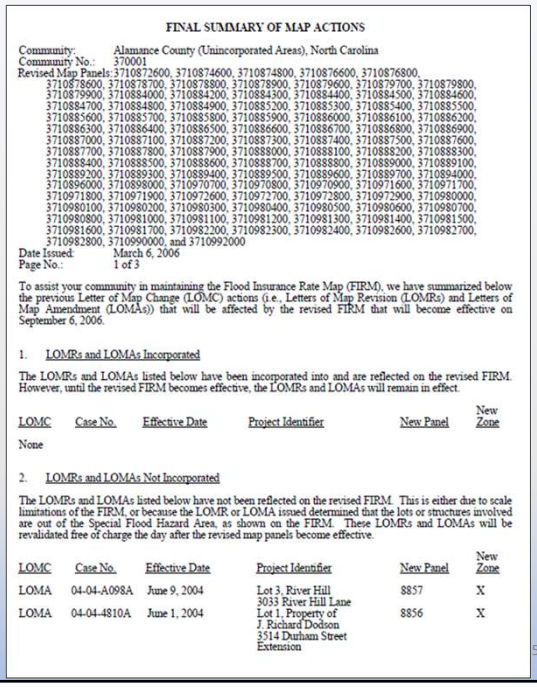
Revalidations

- All LOMCs amending or revising a Flood Insurance Rate Map (FIRM) that is republished become invalid until reviewed and possibly revalidated
- All previous LOMCs are reviewed and compared to new maps to determine whether their outcomes have changed due to new mapping or data



FINAL SUMMARY OF MAP ACTIONS

Community: Alamance County (Unincorporated Areas), North Carolina
Community No.: 370001
Revised Map Panels: 3710872600, 3710874600, 3710874800, 3710876600, 3710876800, 3710878600, 3710878700, 3710878800, 3710878900, 3710879600, 3710879700, 3710879800, 3710879900, 3710884000, 3710884200, 3710884300, 3710884400, 3710884500, 3710884600, 3710884700, 3710884800, 3710884900, 3710885200, 3710885300, 3710885400, 3710885500, 3710885600, 3710885700, 3710885800, 3710885900, 3710886000, 3710886100, 3710886200, 3710886300, 3710886400, 3710886500, 3710886600, 3710886700, 3710886800, 3710886900, 3710887000, 3710887100, 3710887200, 3710887300, 3710887400, 3710887500, 3710887600, 3710887700, 3710887800, 3710887900, 3710888000, 3710888100, 3710888200, 3710888300, 3710888400, 3710888500, 3710888600, 3710888700, 3710888800, 3710889000, 3710889100, 3710889200, 3710889300, 3710889400, 3710889500, 3710889600, 3710889700, 3710894000, 3710896000, 3710898000, 3710970700, 3710970800, 3710970900, 3710971600, 3710971700, 3710971800, 3710971900, 3710972600, 3710972700, 3710972800, 3710972900, 3710980000, 3710980100, 3710980200, 3710980300, 3710980400, 3710980500, 3710980600, 3710980700, 3710980800, 3710981000, 3710981100, 3710981200, 3710981300, 3710981400, 3710981500, 3710981600, 3710981700, 3710982200, 3710982300, 3710982400, 3710982600, 3710982700, 3710982800, 3710990000, and 3710992000
Date Issued: March 6, 2006
Page No.: 1 of 3

To assist your community in maintaining the Flood Insurance Rate Map (FIRM), we have summarized below the previous Letter of Map Change (LOMC) actions (i.e., Letters of Map Revision (LOMRs) and Letters of Map Amendment (LOMAs)) that will be affected by the revised FIRM that will become effective on September 6, 2006.

1. LOMRs and LOMAs Incorporated

The LOMRs and LOMAs listed below have been incorporated into and are reflected on the revised FIRM. However, until the revised FIRM becomes effective, the LOMRs and LOMAs will remain in effect.

LOMC	Case No.	Effective Date	Project Identifier	New Panel	New Zone
None					

2. LOMRs and LOMAs Not Incorporated

The LOMRs and LOMAs listed below have not been reflected on the revised FIRM. This is either due to scale limitations of the FIRM, or because the LOMR or LOMA issued determined that the lots or structures involved are out of the Special Flood Hazard Area, as shown on the FIRM. These LOMRs and LOMAs will be revalidated free of charge the day after the revised map panels become effective.

LOMC	Case No.	Effective Date	Project Identifier	New Panel	New Zone
LOMA	04-04-A098A	June 9, 2004	Lot 3, River Hill 3033 River Hill Lane	8857	X
LOMA	04-04-4810A	June 1, 2004	Lot 1, Property of J. Richard Dodson 3514 Durham Street Extension	8856	X

55

55

Revalidations

- Revalidation document, which includes a Summary of Map Actions (SOMA), is mailed following issuance of new maps:
  - Informs community of previously determined LOMCs that remain valid
  - If new flood hazard information changes determination, LOMA/LOMR-F is reviewed again and new determination may possibly occur

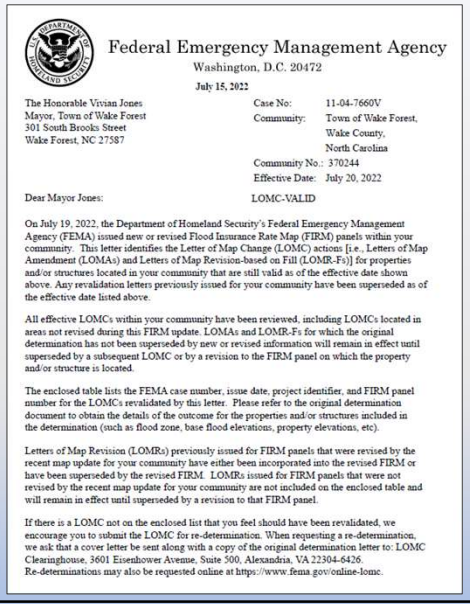
56

Re-Issued and Superseded Cases

- Re-Issued (Not Incorporated):
  - Some LOMCs may be inadvertently left out of revalidation process; if original determination does not change based on republished FIRM, LOMC can be reissued if not covered by revalidation
- Superseded:
  - If flooding source is restudied as part of map action, LOMC can be superseded by new analysis

57

Revalidation Letter



Federal Emergency Management Agency
Washington, D.C. 20472

July 15, 2022

The Honorable Vivian Jones
Mayor, Town of Wake Forest
301 South Brooks Street
Wake Forest, NC 27587

Case No: 11-04-7660V
Community: Town of Wake Forest, Wake County, North Carolina
Community No.: 370244
Effective Date: July 20, 2022

Dear Mayor Jones: LOMC-VALID

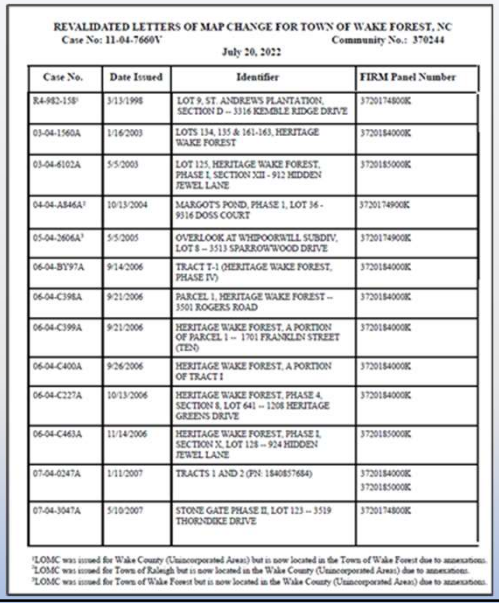
On July 19, 2022, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issued new or revised Flood Insurance Rate Map (FIRM) panels within your community. This letter identifies the Letter of Map Change (LOMC) actions [i.e., Letters of Map Amendment (LOMAs) and Letters of Map Revision-based on Fill (LOMR-Fs)] for properties and/or structures located in your community that are still valid as of the effective date shown above. Any revalidation letters previously issued for your community have been superseded as of the effective date listed above.

All effective LOMCs within your community have been reviewed, including LOMCs located in areas not revised during this FIRM update. LOMAs and LOMR-Fs for which the original determination has not been superseded by new or revised information will remain in effect until superseded by a subsequent LOMC or by a revision to the FIRM panel on which the property and/or structure is located.

The enclosed table lists the FEMA case number, issue date, project identifier, and FIRM panel number for the LOMCs revalidated by this letter. Please refer to the original determination document to obtain the details of the outcome for the properties and/or structures included in the determination (such as flood zone, base flood elevations, property elevations, etc).

Letters of Map Revision (LOMRs) previously issued for FIRM panels that were revised by the recent map update for your community have either been incorporated into the revised FIRM or have been superseded by the revised FIRM. LOMRs issued for FIRM panels that were not revised by the recent map update for your community are not included on the enclosed table and will remain in effect until superseded by a revision to that FIRM panel.

If there is a LOMC not on the enclosed list that you feel should have been revalidated, we encourage you to submit the LOMC for re-determination. When requesting a re-determination, we ask that a cover letter be sent along with a copy of the original determination letter to: LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426
Re-determinations may also be requested online at https://www.fema.gov/online-lomc.



REVALIDATED LETTERS OF MAP CHANGE FOR TOWN OF WAKE FOREST, NC
Case No: 11-04-7660V Community No.: 370244
July 20, 2022

Case No.	Date Issued	Identifier	FIRM Panel Number
R4-982-158[1]	3/13/1998	LOT 9, ST. ANDREWS PLANTATION, SECTION D -- 3316 KEMBLE RIDGE DRIVE	3720174800K
03-04-1560A	1/16/2003	LOTS 134, 135 & 161-163, HERITAGE WAKE FOREST	3720184000K
03-04-6102A	5/5/2003	LOT 125, HERITAGE WAKE FOREST, PHASE I, SECTION XII - 912 HIDDEN JEWEL LANE	3720185000K
04-04-A846A[2]	10/13/2004	MARGOT'S POND, PHASE 1, LOT 36 - 9316 DOSS COURT	3720174900K
05-04-2606A[3]	5/5/2005	OVERLOOK AT WHIPOORWILL SUBDIV, LOT 8 -- 3513 SPARROWWOOD DRIVE	3720174900K
06-04-BY97A	9/14/2006	TRACT T-1 (HERITAGE WAKE FOREST, PHASE IV)	3720184000K
06-04-C398A	9/21/2006	PARCEL 1, HERITAGE WAKE FOREST -- 3501 ROGERS ROAD	3720184000K
06-04-C399A	9/21/2006	HERITAGE WAKE FOREST, A PORTION OF PARCEL 1 -- 1701 FRANKLIN STREET (TEN)	3720184000K
06-04-C400A	9/26/2006	HERITAGE WAKE FOREST, A PORTION OF TRACT 1	3720184000K
06-04-C227A	10/13/2006	HERITAGE WAKE FOREST, PHASE 4, SECTION 8, LOT 641 -- 1208 HERITAGE GREENS DRIVE	3720184000K
06-04-C463A	11/14/2006	HERITAGE WAKE FOREST, PHASE I, SECTION X, LOT 128 -- 924 HIDDEN JEWEL LANE	3720185000K
07-04-0247A	1/11/2007	TRACTS 1 AND 2 (PIN: 1840857684)	3720184000K 3720185000K
07-04-3047A	5/10/2007	STONE GATE PHASE II, LOT 123 -- 3519 THORNDIKE DRIVE	3720174800K

[1]LOMC was issued for Wake County (Unincorporated Areas) but is now located in the Town of Wake Forest due to annexations.
[2]LOMC was issued for Town of Raleigh but is now located in the Wake County (Unincorporated Areas) due to annexations.
[3]LOMC was issued for Town of Wake Forest but is now located in the Wake County (Unincorporated Areas) due to annexations.

58

Common Problems with LOMA and LOMR-F Cases

59

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
  - Elevations not reported to the tenth of a foot

60

Common Problems

- Certifications not provided on forms, Site Plans, FIRM
- Effective NFIP map not used
- Recorded Deed not included
- 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)

61

Common Problems

- 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

62

Exercise: Completing a Case File Summary

63

This Exercise will allow you to …

- Apply skills gained from previous exercises by:
  - Completing 'Case File Summary' and use 'Data Collection' table to organize case file
  - Determining 1% annual chance flood elevation
  - Identifying flood zone subject is now located in and make determination
  - Resolve any follow-up issues

64

Instructions

- Use Flood County, USA, and Incorporated Areas materials
- Site D (on Panel 40) is the subject - located in Flood County, USA
- As a CFS, you are submitting this information on behalf of requestor, and you have already completed the MT-EZ Form, Elevation Form, and Property Information Form

65

Thing you need to know …

- Mr. John Doe has hired you and needs a LOMA for the structure on his property at: 115 Fox Road, Floodville, USA 00001
- LOMA request received on 11/10/2009
- No fill was placed during or after construction of structure (built in 1997), which includes an attached deck
- As-built construction is slab on grade

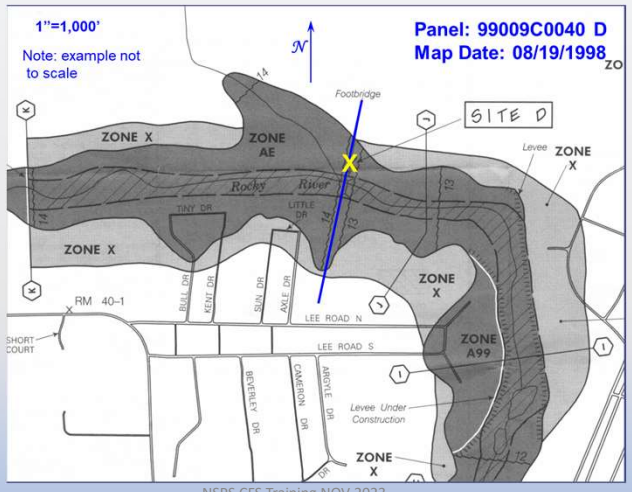
66

Thing you need to know …

- Certified survey of structure was completed
- Property is not subject to subsidence or uplift
- The property is close to, but does not touch, the regulatory floodway
- No current revisions affect subject
- Estimate the Latitude and Longitude from Panel 40

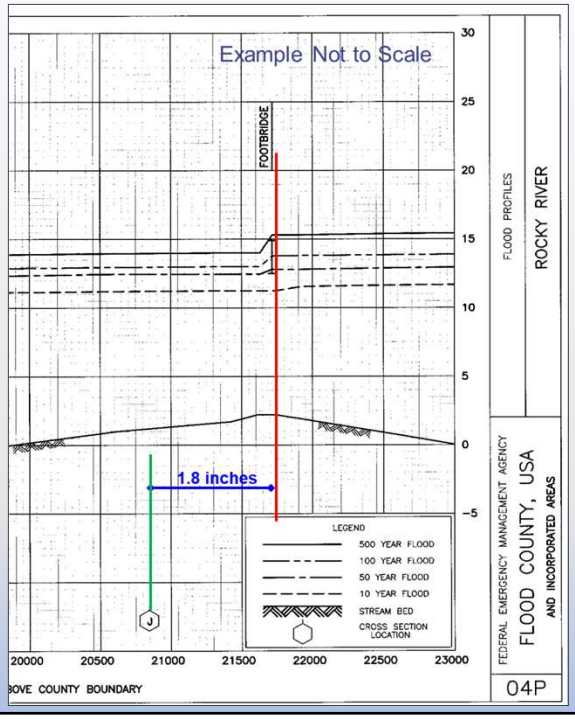
67

Flood County (Unincorporated Areas), USA Map



68

Flood Profile Excerpt



69

69

Deed

BOOK 405 PAGE 788

MONTGOMERY COUNTY
12/15/2000 $14.00
NORTH CAROLINA EXCISE STAMP

Vickie S. Maness
Tax Collector
Montgomery Cty, NC

NORTH CAROLINA GENERAL WARRANTY DEED

THIS DEED made this 30th day of November, 2000, by and between

GRANTOR: John Doe previous owner

GRANTEE: John Doe 115 Fox Road Floodville, USA 00001

Being Lot Nos. One Thousand Two Hundred Eighty-Seven (1287) of the Woodrun Subdivision of Rushwood, Inc., as shown on map recorded in the office of the Register of Deeds of Montgomery County in Map Book No. 7, page 93, formerly, now, Plat Cabinet A, Slide 690, to which plat cabinet for a more particular description of the lot or lots herein conveyed reference is made, and by said reference said map is made a part hereof as fully as is set out herein.

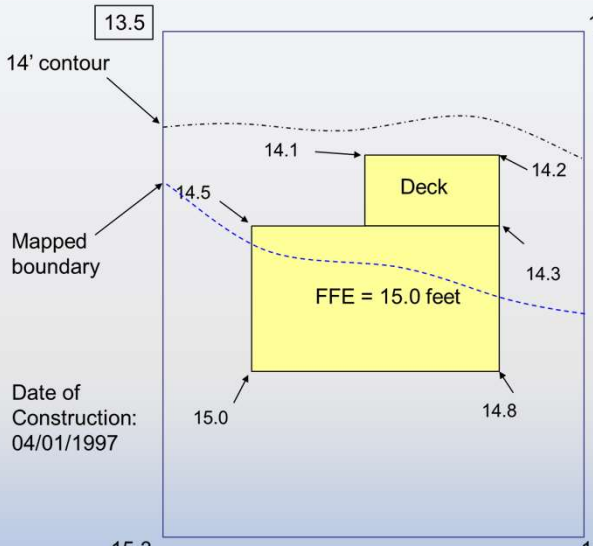
This conveyance is made subject to the easements, limitations, restrictions and uses as set forth and recorded in Deed Book 159, Page 425, Montgomery County Registry, said easements, limitations, restrictions and uses being made a part hereof by reference as if fully set out herein.

For title reference see Book 197, Page 427 of the Montgomery County Registry.

70

70

Certified Survey



NORTH CAROLINA PROFESSIONAL SEAL L-3529 LAND SURVEYOR CALVIN O. SPEARS

Survey for:

Mr. John Doe
115 Fox Road
Floodville, USA 00001
1-877-336-2627

Scale: 1"=30'

71

Complete Items 1-26 to the best of your ability

Case File Summary

Community Number: _____ Case Type: LOMA _____
Lot Type: Single _____ Multiple _____ LOMR-F_____

1 Name of CFS: _____
2 Date CFS Submitted: ___/___/___
3 Community: _____ County: _____ State: _____
4 Property Identifier: _____
5 CFS Telephone #: _____ Fax: _____
6 CFS Address: _____
7 Client Name: _____ Tel. Num.:_____ Fax: _____
8 Client Address: _____
9 Map Panel: _____
10 Date of Effective Map: ___/___/___ Fill Date: ___/___/___
11 Date of First NFIP Map Showing Property in SFHA (required for fill cases): ___/___/___
12 Flooding Source:_____ Detailed or Approximate
13 Revisions/FIS in Progress? Y N If yes, how does it affect property: _____
_____
14 Latitude and Longitude (000.000):_____ Datum:_____
15 Legal Description:_____
_____
_____
16 Comments: _____
_____
_____
_____

72

Topographic and Flooding Information

1. **Structure and Property Elevations** (for Multiple Structures refer to Summary of Elevations)

17 Existing: _____ Proposed: _____

18 Lowest Property: _____ Source: _____ Exhibit No._____

19 Lowest Adjacent Grade: _____ Source: _____ Exhibit No._____

20 Lowest Floor: _____ Source: _____ Exhibit No._____

2. **Flood Elevations** (for Multiple Lots refer to Summary of Elevations)

21 1% Annual Chance Flood: _____ Source: _____Exhibit No._____

22 0.2% Annual Chance Flood: _____ Source: _____ Exhibit No._____

3. **Elevation Datum:**

23 BFE: _____ Property: _____ Conversion: _____

Determination

24 (select one)

LOMA:

Structure-REM_____ Property-REM_____ Metes and Bound-REM_____

Structure-OAS_____ Property-OAS_____ Metes and Bound-OAS_____

LOMR-F:

Structure-REM_____ Property-REM_____ Metes and Bound-REM_____

Structure-OAS_____ Property-OAS_____ Metes and Bound-OAS_____

25 Resultant Flood Zone: _____

Additional Considerations

26 (select all that apply)

_____ Topography Altered by Fill?

_____ Is Any Portion of the Property in the Floodway?

_____ Inadvertent Inclusion in Floodway?

_____ Is the Property in Zone A?

_____ Is the Property Revised by LOMR? Date: _____

_____ Has the Property been Annexed since the date of the effective FIRM?

73

Review Answers

74

Follow-up Questions

- Are fees required for this action?
- After the case is complete and organized what is your next step as a CFS?

75

BFE in Zone A (un-numbered A Zones)

76

ZONE A
44 CFR 60.3(b)(3)&(4) - The Community Shall:

- Require BFE data for developments greater than 50 lots or 5 acres, whichever is lesser
- Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source

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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:

78

ZONE A - best available data considerations

- 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

79

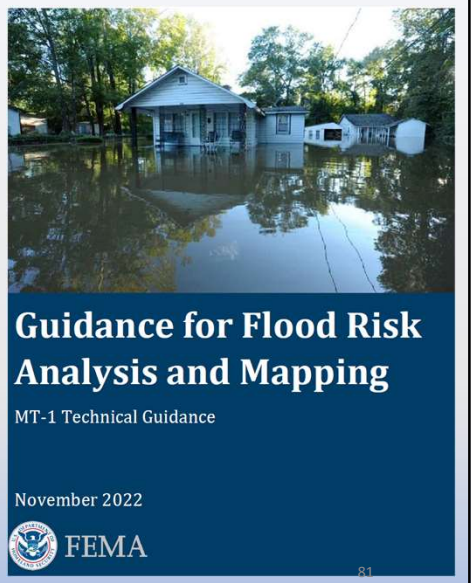
ZONE A Determination By FEMA

- 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

80

BFE Development Procedures (ZONE A)

- 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



81

Light Detection and Ranging (LiDAR) Letter of Map Amendment

- FEMA accepts LOMA applications using elevations based on LiDAR data
- Contours Based - 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)
- 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)

82

LiDAR cannot be used for:

- 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)

83

LiDAR cannot be used for:

- 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

84

Conclusion

- You should:
  - Be familiar with organizing information for a LOMA or LOMR-F request
  - Be familiar with a 'Case File Summary'
  - Be familiar with 'Data Collection' table
  - Be able to complete MT-EZ Form, Elevation Form, and Property Information Form for the exercise
  - Zone A and LiDAR LOMAs

85

Questions?

86

Certified Floodplain Surveyor (CFS) Quiz

LOMC Processing

1. Are fees required for properties where grading has occurred, prior to construction, to Raise/elevate the building pad? If 'No', why?

2. What must accompany a Site Map depicting a portion of property for removal from the SFHA?

3. Is it acceptable to submit an Elevation Certificate/ Elevation Form that does not indicate the elevation datum with a LOMA request? If 'No', why?

4. Which is considered to be the most accurate method of BFE determination?

   A. Interpolation between BFE lines
   B. Flood Profile/FIRM distance method
   C. Estimation from USGS Quad
   D. Consultation with local home owners and officials

5. The Property Information Form should be completed ….

   A. as if the property owner is the requestor
   B. only in cases involving fill
   C. as if the CFS is the requestor
   D. when the community requests it

6. A structure is plotted on the FIRM, based on road data for control purposes, and the plot clearly indicates the structure is located over a streamline in an unnumbered Zone A area. In the field, it is obvious that the structure is not located on the stream. Can a CFS determine the BFE for the stream? If 'No', why?

Certified Floodplain Surveyor
(CFS) Quiz
LOMC Processing

7. What must a typical LOMA submittal include?

8. Which information should be included with the submitted FIRM plot?

A. Certification stamp
B. Accurate indication of the subject
C. Panel number and CID
D. Scale bar and north arrow
E. All of the above

Case File Summary

Community Number: _____ Case Type: LOMA _____

Lot Type: Single _____ Multiple _____ LOMR-F_____

Name of CFS: _____

Date CFS Submitted: ____/____/____

Community: _____ County: _____ State: _____

Property Identifier: _____

CFS Telephone #: _____ Fax: _____

CFS Address: _____

Client Name: _____ Tel. Num.:_____ Fax: _____

Client Address: _____

Map Panel: _____

Date of Effective Map: ___/___/___ Fill Date: ___/___/___

Date of First NFIP Map Showing Property in SFHA (required for fill cases): ___/___/___

Flooding Source:_____ Detailed or Approximate

Revisions/FIS in Progress? Y N If yes, how does it affect property: _____
_____

Latitude and Longitude (000.000):_____ Datum:_____

Legal Description:_____

_____

_____

Comments: _____

_____

_____

_____

Topographic and Flooding Information

1. **Structure and Property Elevations** (for Multiple Structures refer to Summary of Elevations)
   Existing: _____ Proposed: _____
   Lowest Property: _____ Source: _____ Exhibit No._____
   Lowest Adjacent Grade: _____ Source: _____ Exhibit No._____
   Lowest Floor: _____ Source: _____ Exhibit No._____
2. **Flood Elevations** (for Multiple Lots refer to Summary of Elevations)
   1% Annual Chance Flood: _____ Source: _____Exhibit No._____
   0.2% Annual Chance Flood: _____ Source: _____ Exhibit No._____
3. **Elevation Datum:**
   BFE: _____ Property: _____ Conversion: _____

Determination

LOMA:

Structure-REM_____ Property-REM_____ Metes and Bound-REM_____
Structure-OAS_____ Property-OAS_____ Metes and Bound-OAS_____

LOMR-F:

Structure-REM_____ Property-REM_____ Metes and Bound-REM_____
Structure-OAS_____ Property-OAS_____ Metes and Bound-OAS_____

Resultant Flood Zone: _____

Additional Considerations

_____ Topography Altered by Fill?
_____ Is Any Portion of the Property in the Floodway?
_____ Inadvertent Inclusion in Floodway?
_____ Is the Property in Zone A?
_____ Is the Property Revised by LOMR? Date: _____
_____ Has the Property been Annexed since the date of the effective FIRM?

Data Collection

Exhibit Num.	ITEM	Initial Submit Date	Date Requested	Date Received
	Property Information /MT-EZ form			
	Recorded Plat			
	Recorded Deed			
	Tax Assessor's Map or Similar Suitable Map			
	Effective FIRM or FHBM			
	Effective FBFM (Floodway)			
	Preliminary FIRM			
	Map Showing Structure Locations			
	Metes & Bounds Description			
	Metes & Bounds Map			
	Elevation Information Form or Certificate			
	Summary of Elevations/Lot Breakdown Form			
	Effective Profile			
	Floodway Data Table			
	Stillwater Elevations Table			
	Data Supporting the BFE			
	Topography/Countours/Grading Plan			
	Community Acknowledgement form			
	Fee ($_____)			
	Other Data: _____			
	_____			
	_____			

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

PROPERTY INFORMATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.63 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form may be completed by the property owner, 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. In order to process your request, all information on this form must be completed ***in its entirety***, unless stated as optional. **Incomplete submissions will result in processing delays.** Please check the item below that describes your request:

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

Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base 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 (SFHA) is considered natural grade.**

Has fill been placed on your property to raise ground that was previously below the BFE? ☐ Yes ☐ No If yes, when was fill placed? mm/dd/yyyy

Will fill be placed on your property to raise ground that is below the BFE? ☐ Yes* ☐ No If yes, when will fill be placed? mm/dd/yyyy

* If yes, Endangered Species Act (ESA) compliance must be documented to FEMA prior to issuance of the CLOMR-F determination (please refer page 4 to the MT-1 instructions).

1. Street Address of the Property (if request is for multiple structures or units, please attach additional sheet referencing each address and enter street names below):

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed):

3. Are you requesting that a flood zone determination be completed for (check one):

   ☐ Structures on the property? What are the dates of construction? _____ (MM/YYYY)
   ☐ A portion of land within the bounds of the property? (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**. For the preferred format of metes and bounds descriptions, please refer to the MT-1 Form 1 Instructions.)
   ☐ The entire legally recorded property?

4. Is this request for a (check one):
   ☐ Single structure
   ☐ Single lot
   ☐ Multiple structures (How many structures are involved in your request? List the number: _____)
   ☐ Multiple lots (How many lots are involved in your request? List the number: _____)

In addition to this form (MT-1 Form 1), please complete the checklist below. **ALL** requests must include one copy of the following:

☐ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted (property inadvertently located in the NFIP regulatory floodway will require Section B of MT-1 Form 3)

☐ Copy of the Subdivision Plat Map for the property **(with recordation data and stamp of the Recorder's Office)**

OR

☐ Copy of the Property Deed **(with recordation data and stamp of the Recorder's Office)**, ***accompanied by*** a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.

☐ Form 2 – Elevation Form. If the request is to remove the structure, and an Elevation Certificate has already been completed for this property, it may be submitted in lieu of Form 2. If the request is to remove the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2.

☐ Please include a map scale and North arrow on all maps submitted.

For LOMR-Fs and CLOMR-Fs, the following must be submitted in addition to the items listed above:

☐ Form 3 – Community Acknowledgment Form

For CLOMR-Fs, the following must be submitted in addition to the items listed above:

☐ Documented ESA compliance, which may include 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. Please refer to the MT-1 instructions for additional information.

Please do *not* submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc [CD]). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-1 Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm**.**

Processing Fee (see instructions for appropriate mailing address; or visit http://www.fema.gov/fhm/frm_fees.shtm **for** the most current fee schedule)

Revised fee schedules are published periodically, but no more than once annually, as noted in the **Federal Register**. Please note: single/multiple lot(s)/structure(s) LOMAs are fee exempt. The current review and processing fees are listed below:

Check the fee that applies to your request:

☐ $325 (single lot/structure LOMR-F following a CLOMR-F)

☐ $425 (single lot/structure LOMR-F)

☐ $500 (single lot/structure CLOMA or CLOMR-F)

☐ $700 (multiple lot/structure LOMR-F following a CLOMR-F, or multiple lot/structure CLOMA)

☐ $800 (multiple lot/structure LOMR-F or CLOMR-F)

Please submit the Payment Information Form for remittance of applicable fees. Please make your check or money order payable to:

National Flood Insurance Program.

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required):

Company (if applicable):

Mailing Address (required):

Daytime Telephone No. (required):

E-Mail Address (optional): ☐ By checking here you may receive correspondence electronically at the email address provided):

Fax No. (optional):

Date (required)

_____

Signature of Applicant (required)

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. **A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.**

For requests to remove a structure on natural grade OR on engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), ***including an attached deck or garage***. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed ***in its entirety*****. Incomplete submissions will result in processing delays.**

1. NFIP Community Number: Property Name or Address:

2. Are the elevations listed below based on ☐ ***existing*** or ☐ ***proposed*** conditions? (Check one)

3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☐ other (explain)

4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ☐ No
   If yes, what is the date of the current re-leveling? / (month/year)

5. What is the elevation datum? ☐ NGVD 29 ☐ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor?
   Local Elevation +/- ft. = FIRM Datum

6. Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .
   Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:
Company Name:	Telephone No.:	
Email:	Fax No.	
Signature:	Date:	

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

Continued from Page 1.

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:
Company Name:	Telephone No.:	
Email:	Fax No.	
Signature:	Date:	

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.38 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. 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 this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) ***OR*** to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number**:** _____ Property Name or Address**:** _____

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature: (required)	Date:

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name:

Project Identifier:

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Please make check or money order payable to the National Flood Insurance Program.

Type of Request:

☐ MT-1 application
☐ MT-2 application

LOMC Clearinghouse
847 South Pickett Street
Alexandria, VA 22304-4605
Attn.: LOMC Manager

☐ EDR application

FEMA Project Library
847 South Pickett Street
Alexandria, VA 22304-4605
FAX (703) 212-4090

Request No. (if known): _____ **Check No.:** _____ **Amount:** _____

☐ INITIAL FEE* ☐ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

****Note: Check only if submitting a corrected fee for an ongoing request.**

COMPLETE THIS SECTION *ONLY* IF PAYING BY CREDIT CARD

CARD NUMBER EXP. DATE

				–				–				–				–			
1	2	3	4		5	6	7	8		9	10	11	12		13	14	15	16	

Month Year

_____ _____
Date Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(*for your credit card receipt-please print or type*) _____

DAYTIME PHONE: _____

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.

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

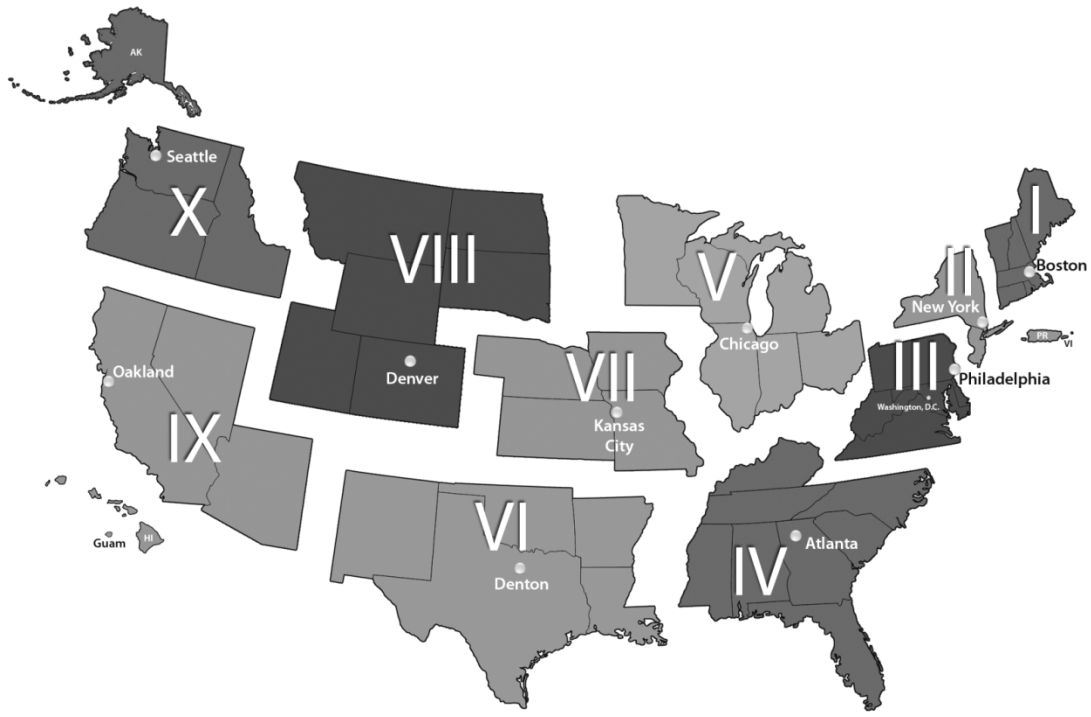
Address for Submitting Requests

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 visits 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.

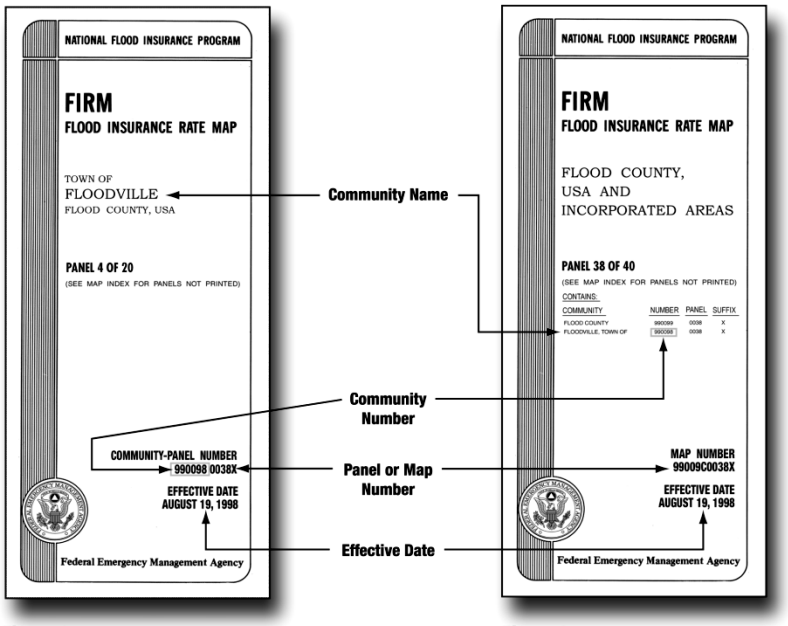


Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

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. 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 4of 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. 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.

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY
APPLICATION FORM FOR SINGLE RESIDENTIAL LOT OR STRUCTURE AMENDMENTS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 2.4 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. This collection of information is required to obtain or retain benefits. 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, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015) **NOTE: Do not send your completed form to this address.**

This form should be used to request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) remove a single structure or legally recorded parcel of land or portion thereof, described by metes and bounds, certified by a registered professional engineer or licensed land surveyor, from a designated Special Flood Hazard Area (SFHA), an area that would be inundated by the flood having a 1%-chance of being equaled or exceeded in any given year (base flood), via Letter of Map Amendment (LOMA). It shall not be used for requests submitted by developers, for requests involving multiple structures or lots, for property in alluvial fan areas, for property located within the regulatory floodway, or requests involving the placement of fill. (NOTE: Use MT-1 forms for such requests). **Fill** is defined as material from any source (including the subject property) placed that raises the grade to or above the Base 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. Also, fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in an SFHA is considered natural grade.

LOMA:	**A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the base flood.**

A – This section may be completed by the property owner or by the property owner's agent. In order to process your request, all information on this form must be completed ***in its entirety***, unless stated as optional. **Incomplete submissions will result in processing delays.**

1. Has fill been placed on your property to raise ground that was previously below the BFE?

   ☐ No ☐ Yes – If Yes, **STOP!! – You must complete the MT-1 application forms; visit http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm or call the FEMA Map Information eXchange toll free: (877-FEMA MAP) (877-336-2627)**

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed) ***and*** street address of the Property (required):

3. Are you requesting that a flood zone determination be completed for (check one):

   ☐ A structure on your property? What is the date of construction? _____ (MM/YYYY)

   ☐ A portion of your legally recorded property? (A certified metes and bounds description and map of the area to be removed, certified by a registered professional engineer or licensed land surveyor, are **required**. For the preferred format of metes and bounds descriptions, please refer to the MT-EZ Instructions.)

   ☐ Your entire legally recorded property?

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required):	**E-mail address (optional) (☐ By checking here you may receive correspondence electronically at the email address provided):**
Mailing Address (include Company name if applicable) (required):	**Daytime Telephone No. (required):**
	Fax No. (optional):
Signature of Applicant (required)	**Date (required)**

End of Section A

B – <u>This section *must* be completed by a registered professional engineer or licensed land surveyor</u>. Incomplete submissions will result in processing delays.

NOTE: If the request is to have a flood zone determination completed for the structure, and an Elevation Certificate has been completed for this property, it may be submitted in lieu of Section B. If the request is to have a flood zone determination completed for the entire legally recorded property, or a portion thereof, the lowest elevation on the lot or described portion must be provided in Section B.

Applicable Regulations

The regulations pertaining to LOMAs are presented in the National Flood Insurance Program (NFIP) regulations under Title 44, Chapter I, Parts 70 and 72, Code of Federal Regulations. 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 his or her property has been inadvertently included in a designated SFHA. The necessity of Part 70 is due in part to the technical difficulty of accurately delineating the SFHA boundary on an NFIP map. 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 [e.g., a Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM)] showing the property to be within the SFHA.

Basis of Determination

DHS-FEMA's determination as to whether a structure or legally recorded parcel of land, or portion thereof, described by metes and bounds, may be removed from the SFHA will be based upon a comparison of the Base (1%-annual-chance) Flood Elevation (BFE) with certain elevation information. The elevation information required is dependent upon what is to be removed from the SFHA. For Zones A and AO, please refer to Page 7 of the MT-EZ Form Instructions for information regarding BFE development in those areas and supporting data requirements.

Determination Requested For: (check one)	**Elevation Information Required: (complete Item 5)**
☐ Structure located on natural grade (LOMA)	Lowest Adjacent Grade to the structure (the elevation of the lowest ground touching the structure including attached patios, stairs, deck supports or garages)
☐ Legally recorded parcel of land, or portion thereof (LOMA)	Elevation of the lowest ground on the parcel or within the portion of land to be removed from the SFHA

1. PROPERTY INFORMATION

Property Description (Lot and Block Number, Tax Parcel Number, or Abbreviated Description from the Deed, etc.):

2. STRUCTURE INFORMATION

Street Address (including Apt. Unit, Suite, and/or Bldg. No.):

What is the type of construction? (check one) ☐ crawl space ☐ slab on grade ☐ basement/enclosure

☐ other (explain):

3. GEOGRAPHIC COORDINATE DATA

Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to nearest fifth decimal place)

Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .

Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to nearest fifth decimal place)

Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .

4. FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

NFIP Community Number:	Map Panel Number:	Base Flood Elevation (BFE):	Source of BFE:

5. ELEVATION INFORMATION (SURVEY REQUIRED)

- Lowest Adjacent Grade (LAG) to the structure (to the nearest 0.1 foot or meter) . ft. (m)
- Elevation of the lowest grade on the property; or within metes and bounds area (to the nearest 0.1 foot or meter) . ft. (m)
- Indicate the datum (if different from NGVD 29 or NAVD 88 attach datum conversion) ☐ NGVD 29 ☐ NAVD 88 ☐ Other (add attachment)
- Has FEMA identified this area as subject to land subsidence or uplift? ☐ No ☐ Yes (provide date of current releveling):

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name:	License No.:	Expiration Date:	Seal (optional)
Company Name:	Telephone No.:	Fax No.:	
Email:			
Signature:		Date:	

In addition to this form (MT-EZ), please complete the checklist below. **ALL** requests must include one copy of the following:

- ☐ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted
- ☐ Copy of the Subdivision Plat Map **(with recordation data and stamp of the Recorder's Office)**

OR

- ☐ Copy of the Property Deed **(with recordation data and stamp of the Recorder's Office)**, ***accompanied by*** a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.
- ☐ Please include a map scale and North arrow on all maps submitted.

Please do *not* submit original documents. Please retain a copy of all submitted documents for your records.

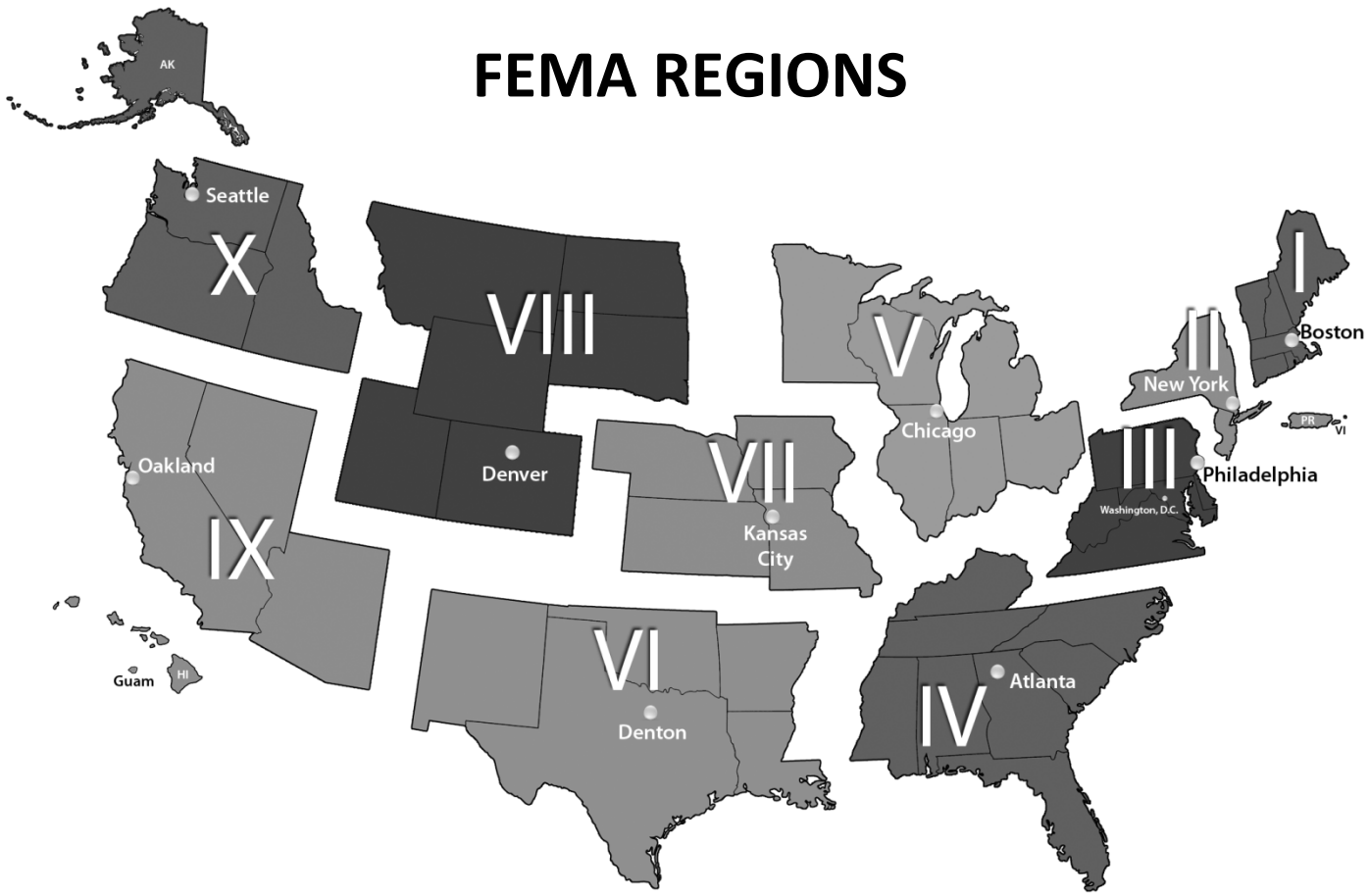
DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc [CD]). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-EZ Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-ez.shtm.

Mail your request to:

LOMC CLEARINGHOUSE
847 SOUTH PICKETT STREET
ALEXANDRIA, VA 22304-4605
Attn.: LOMA Manager

FEMA REGIONS



APPLICATION FORM FOR SINGLE RESIDENTIAL STRUCTURE OR LOT AMENDMENTS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

eLOMA

A faster alternative to using the MT-EZ 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. Most requests that qualify for the MT-EZ application can be submitted to FEMA using eLOMA. You can find additional information about eLOMA 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 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. 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 in 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 (DHS-FEMA) implemented the use of application forms for requesting revisions or amendments to NFIP maps for two reasons. First, the forms provide requesters with a comprehensive, step-by-step process to follow. This process provides the requester with assurance that all necessary information to support their request is being submitted to DHS-FEMA at one time, thus avoiding the need 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 assures that the requesters' submissions are complete and more logically structured, and generally allows DHS-FEMA to complete its review in a shorter timeframe.

This form should be used to request that DHS-FEMA remove a single structure or a legally recorded parcel of land or a portion of a parcel, described by metes and bounds, certified by a Registered Professional Engineer or Licensed Land Surveyor, from a designated Special Flood Hazard Area (SFHA), an area that would be inundated by the flood having a 1-percent-annual-chance of being equaled or exceeded in any given year (base flood), via Letter of Map Amendment (LOMA). A LOMA is a letter from DHS-FEMA stating that an **existing** structure or parcel of land that has not been elevated by fill (i.e., the existing structure or parcel of land is on natural grade) would not be inundated by the base flood. ***Fill*** is defined as material from any source (including the subject property) placed that raises the ground to or above the Base 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 ground) elevation, which is at or above the BFE. **Fill placed before the date of the first NFIP map showing the area in an SFHA is considered natural ground.** You may consult with the community map repository or the community official or agency responsible for floodplain management to obtain previous editions of the NFIP map. In addition, digital copies of historic

maps may be available on DHS-FEMA's Map Service Center (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 (FMIX) toll free, at 1-877-FEMA MAP (1-877-336-2627).

The MT-EZ form shall not be used for requests submitted by developers, for requests involving multiple structures or lots, for property in alluvial fan areas, for property located within the regulatory floodway, for requests involving the placement of fill, or for conditional requests—for such requests, requesters should use the MT-1 or MT-2 application forms, as appropriate. The MT-1 and MT-2 forms packages may be downloaded from the DHS-FEMA Flood Maps website at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1 and https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2.

For additional assistance in completing this form, interested parties may consult the LOMA Tutorial, available on DHS-FEMA's Flood Maps website at: https://www.fema.gov/flood-maps/tutorials/letter-map-amendment.

Data Submission Requirements

In accordance with NFIP regulations, DHS-FEMA will use the information provided in the MT-EZ form to determine whether property (i.e., structure, parcel of land) should be removed from a designated SFHA. In certain instances, additional data not referenced on the MT-EZ form may be required. A DHS-FEMA representative will notify the requester of any additional data 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 are presented in Title 44, Chapter I, Code of Federal Regulations (CFR), Part 70, which are available at https://www.govinfo.gov/app/details/CFR-2011-title44-vol1/CFR-2011-title44-vol1-part70. 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 the 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 (FHBM)] showing the property to be within the SFHA.

Basis of Determination

If no fill has been placed, DHS-FEMA's determination as to whether a structure or legally recorded parcel of land, or a portion of a parcel, described by metes and bounds, may be removed from the SFHA will be based on a comparison of the BFE with certain elevation information. The elevation information required will depend on whether a structure or a legally recorded parcel of land is to be removed from the SFHA. For LOMA requests involving property located in Zone A, with no BFEs determined, interested parties should refer to DHS-FEMA-265, *Managing Floodplain Development in Approximate Zone A Areas, A Guide for Obtaining and Developing Base (100-Year) Flood Elevations*, available on DHS-FEMA's website at https://www.fema.gov/sites/default/files/documents/fema_approx-zone-a-guide.pdf.

The following special considerations 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 Section 70.4 of the NFIP regulations, 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 LOMA requests and other 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. Information about the status of LOMA requests and other Letter of Map Change (LOMC) requests is also available from DHS-FEMA's Flood Maps website at https://www.fema.gov/flood-maps/change-your-flood-zone/status. The FHM site allows requesters to search LOMCs by entering their Project (Case) Number or Community Name.

As mentioned previously, submitting the MT-EZ form and required supporting documents in digital format may help expedite the processing of your request.

Effect on Insurance Purchase Requirements

Although DHS-FEMA may issue a LOMA removing a structure 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 lender agrees to waive the flood insurance purchase requirement, 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 and evidence of the waiver of the flood insurance requirement from the lender to the insurance agent or broker who sold the policy.

General Instructions – Section A

The property owner, a Licensed Land Surveyor, or a Registered Professional Engineer may complete Section A to support a request for a LOMA for a single structure or lot.

Before completing Section A, the requester must obtain one of 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 relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.
- 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 must also obtain a photocopy of the effective FIRM panel (including the Title Block) that shows the area in which the property is located. This map 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 DHS-FEMA Map Service Center (MSC). Interested parties may visit the MSC website at https://msc.fema.gov/portal. A FIRMette, which can be printed free of charge from the MSC website, may be submitted in lieu of a photocopy of the FIRM. (For some communities, the effective NFIP map may be a Flood Hazard Boundary Map (FHBM), not a FIRM. In such cases, the requester should obtain and use the FHBM.)

Requesters without Internet access should contact the FMIX by calling 1-877-FEMA MAP (1-877-336-2627).

Specific Instructions – Section A

Number 1 - Fill Placement

Regardless of the type of LOMC being requested, the requester must clearly state, to the best of his or her knowledge, whether fill has been placed on the property. The requester must answer "yes" or "no" to this question. (See "Use of Application Forms" for additional information about fill.) If fill has been placed on the property, the requester must submit a request for a Letter of Map Revision Based on Fill (LOMR-F) using the MT-1 application forms so that DHS-FEMA may determine whether the structure or property should be removed from the SFHA. To obtain a copy of the MT-1 application forms package, interested parties should visit DHS-FEMA's Flood Maps website at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1 or call the DHS-FEMA Mapping and Insurance eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Number 2 - Legal Description of Property

The requester must describe the property by referring to the recorded 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. It is not necessary to reproduce a lengthy description of the property as it appears in the Deed. In addition, the requester should enter the street address (911 type) for the property if one is available.

Number 3 - Structure or Property That Is Subject of Request

DHS-FEMA will make a LOMA determination for a structure or a parcel of land. The requester must select the one for which they would like DHS-FEMA to make a determination. If the request is for a structure, the requester must provide the date of construction in this section. Date of construction information usually may 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 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 a CD. This may help expedite the processing of your request.

Signature

The requester must provide his or her name, mailing address, and telephone number in the space provided. The requester also must sign and date, where indicated, to certify the accuracy of the information provided in Section A of the form. A Licensed Land Surveyor, Registered Professional Engineer, or other designated agent may sign this form for the requester when submitting on behalf of the requester. 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.

General Instructions – Section B

A Licensed Land Surveyor or Registered Professional Engineer (authorized by law to certify the information requested) must complete Section B unless an NFIP Elevation Certificate has already been completed for the property. If the request is to remove the structure, and an Elevation Certificate has been completed, the Elevation Certificate may be submitted in lieu of Section B of the MT-EZ form. If the request is to remove the entire legally recorded property, the lowest lot elevation must be provided in Section B. If the request is to remove a portion of the legally recorded property, the lowest elevation within the described portion must be provided in Section B.

Before completing Section B, the surveyor or engineer must obtain the effective 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 digital copies may be available on the MSC. The engineer or surveyor should visit https://msc.fema.gov/portal. (For some communities, the effective NFIP map may be an FHBM, not a FIRM. In such cases, the engineer or surveyor should obtain and use the FHBM.)

Surveyors and engineers who do not have Internet access should contact the FMIX by calling 1-877-FEMA MAP (1-877-336-2627).

Specific Instructions – Section B

Determination Requested For

The surveyor or engineer must identify what is to be removed from the SFHA. The surveyor or engineer must provide the required elevation information as described on the form.

Number 1 – Property Information

The surveyor or engineer must provide a brief description of the property by referring to the recorded 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. It is not necessary to reproduce a lengthy description of the property as it appears in the Deed.

Number 2 - Structure Information

The surveyor or engineer must provide the street address for the property (911 type), if one is available, or the name of road providing access.

If the request involves or will involve a structure, the surveyor or engineer must 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 3 – Geographic Coordinate Data

The surveyor or engineer must provide the latitude and longitude of the property in decimal degrees to the nearest fifth decimal place (00.00000), and indicate the appropriate horizontal datum, WGS 84, NAD 83 or NAD 27.

Number 4 - Flood Insurance Rate Map Information

In the first box, the surveyor or engineer must provide the six-digit NFIP community number as it appears in the Title Block of the FIRM (or FHBM) panel that shows the area where the property is located. In the second box, the surveyor or engineer must provide the map panel number. For additional information on reading FIRM panels interested parties may consult the tutorial "How to Read a FIRM" on DHS-FEMA's Flood Maps website at https://www.fema.gov/sites/default/files/2020-07/how-to-read-flood-insurance-rate-map-tutorial.txt.

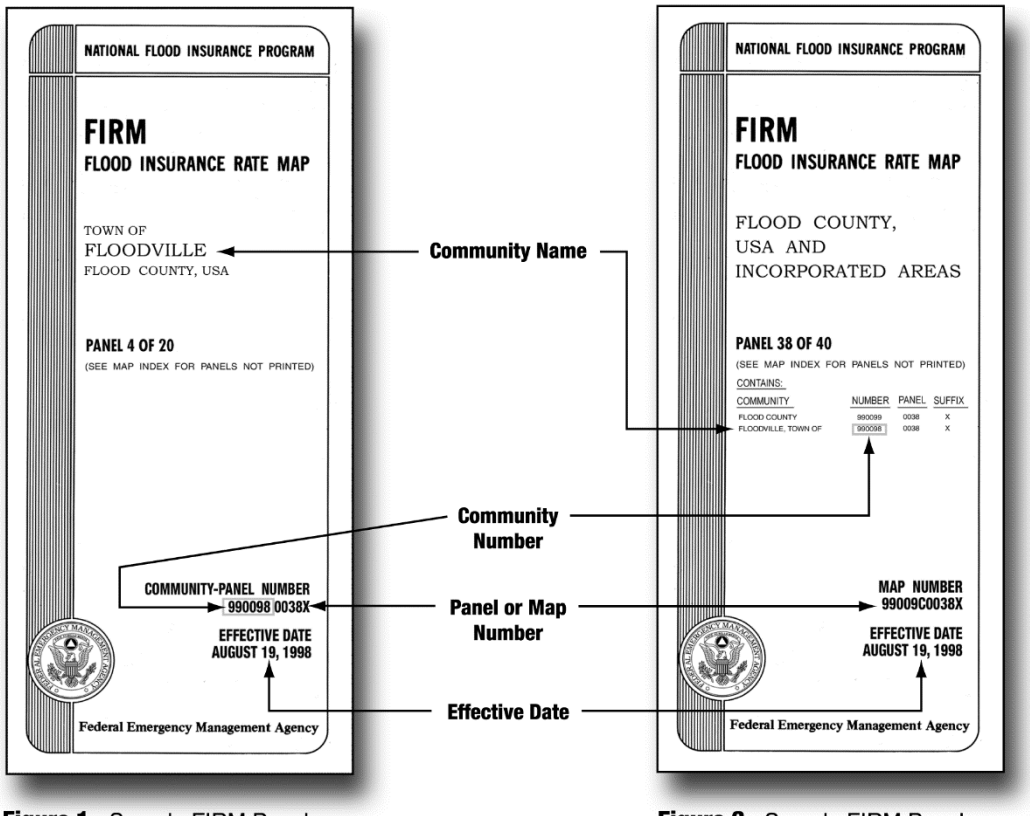


Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

In the third box, the surveyor or engineer should provide the BFE, if available. FEMA will verify the BFE during the review process. In the fourth box, the surveyor or engineer must provide the source of the BFE. The surveyor or engineer may obtain the BFE 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 the flood zone where the property is located. The summary below provides guidance as to how to determine the BFE as a result of the flooding type and flood zone determination.

- ***Riverine Flooding Systems (Zones AE or A1-A30)*** – Consult the FIS report for the community in which the property is located. 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-year flood profile line.
- ***Lacustrine (Stillwater) Flooding Systems*** – Consult the FIS report for the community in which the property is located. 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 0.1 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 Zone A, an area of approximate flooding with no BFEs determined, determine a BFE. Consult with a Federal, State, or local government agency to determine if that 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. If a BFE has not previously been developed, consult DHS-FEMA 265, *Managing Floodplain Development in Approximate Zone A Areas, A Guide for Obtaining and Developing Base (100-Year) Flood Elevations*, available on the DHS-FEMA website https://www.fema.gov/sites/default/files/documents/fema_approx-zone-a-guide.pdf. This publication is an excellent resource that details the appropriate methods for determining BFEs in SFHAs designated Zone A. To obtain additional information about developing BFEs, contact the DHS-FEMA Map Information eXchange, toll free, 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 in accordance with Paragraph 60.3(b)(3) of the NFIP regulations, 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)*** – For a property located in 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.

Number 5 – Elevation Information

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 0.1 foot. If the FIRM shows BFEs in meters, the accuracy of the LAG elevation must be to the nearest 0.1 meter.

Lowest Lot Elevation – For requests involving property, or a portion thereof, not a structure, provide the lowest lot elevation to the nearest 0.1 foot. If the FIRM shows BFEs in meters, the accuracy of the lowest lot elevation must be to the nearest 0.1 meter. If the BFE varies across the property, please provide a certified site plan showing the range of elevations across the property.

Elevation Datum – Provide the elevation datum (e.g., National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988 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, provide the datum conversion. Please note that Mean Sea Level Datum is used within the Commonwealth of Puerto Rico and Local Tidal Datum is used within the U.S. Virgin Islands.

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 relevels some benchmarks to determine new elevations above the National Geodetic Vertical Datum of 1929 or above the North American Vertical Datum of 1988; however, not all benchmarks are releveled 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 releveling; 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. Consult the effective FIS report for the community where the property is located or the local floodplain administrator for the most current ERM data.

In general, the effects of subsidence can be accounted for by determining ground and structure elevations using benchmark elevations with the same releveling date as the benchmarks used to develop the BFEs on the FIRM. Benchmark releveling dates may be different for different flooding sources. No adjustment is necessary to the BFEs on the FIRM.

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.

Submitting the Package to DHS-FEMA

In addition to the completed MT-EZ form, all requests must include one copy of the subdivision plat map (with recordation data and stamp of the Recorder’s Office) or a copy of the property deed (with recordation data and stamp of the Recorder’s Office), accompanied by a tax assessor’s map or other suitable map showing the surveyed location of the property with respect to local streets and watercourses; a copy of the effective FIRM panel; and a map scale and North arrow for all maps submitted. Please do not submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages electronic submissions through the Online LOMC Tool at https://hazards.fema.gov. This new 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.

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 to the address listed below. **Incomplete submissions will result in processing delays.**

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

Interested parties who have any additional questions about the LOMA request process may consult the DHS-FEMA Flood Maps website at https://www.fema.gov/flood-maps/change-your-flood-zone/loma-lomr-f or call the DHS-FEMA Mapping and Insurance eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). For information on the status of a particular LOMA request, interested parties may also consult DHS-FEMA’s Mapping Information Platform (MIP) at https://hazards.fema.gov.

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name:

Project Identifier:

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Please make check or money order payable to the National Flood Insurance Program.

Type of Request:

☐ MT-1 application
☐ MT-2 application

LOMC Clearinghouse
3601 Eisenhower Ave. Suite 500
Alexandria, VA 22304-6426
Attn.: LOMC Manager

☐ EDR application

FEMA Project Library
3601 Eisenhower Ave. Suite 500
Alexandria, VA 22304-6426
FAX (703) 960-9125

Request No. (if known): _____ **Check No.:** _____ **Amount:** _____

☐ INITIAL FEE* ☐ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

****Note: Check only if submitting a corrected fee for an ongoing request.**

COMPLETE THIS SECTION *ONLY* IF PAYING BY CREDIT CARD

CARD NUMBER EXP. DATE

				–				–				–					–		
1	2	3	4		5	6	7	8	9	10	11	12	13	14	15	16	Month		Year

_____ _____

Date Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(*for your credit card receipt-please print or type*) _____

DAYTIME PHONE: _____

NSPS Certified Floodplain Surveyor (CFS)
Northeast Training and Certification Program

Module 8

Letters of Map Change (LOMC)
Issuance and CFS Support and Renewal

October 31 - November 3, 2023

1

This module will…

- Discuss Researching Historical Actions
- Describe Issuance and Distribution of Letters of Map Change
- Provide an overview of FEMA and PTS Contractor Role in CFS Submittals
- Provide CFS Support Resources

2

Researching Historical Actions

A Visit to the Map Service Center

3

Why Is It Necessary?

- Historical actions, including LOMRs, LOMAs, and LOMR-Fs, are very important
- LOMRs change what is represented on flood map (and often data that are presented in tables and Flood Profiles in FIS report)
- Communities annex or adjust boundaries, it is important to verify and use the correct CID

4

Why Is It Necessary?

- Information more recent than effective NFIP information may be available to use during LOMC processing
- LOMAs and LOMR-Fs may already be processed for nearby properties and structures; this information may be helpful in processing a current LOMA or LOMR-F

5

Researching Historical Actions

- Step 1 – Contact the County or Community Floodplain Administrator:
  - This is often an employee of Planning, Zoning, or Inspections Office or an Engineer
  - Request list of and copies of all LOMCs issued for County or Community
  - Review LOMCs

6

Researching Historical Actions

- Step 2 – Contact the State NFIP Coordinator:
  - Only if County or Community does not have copies of information you need
  - Request list of and copies of all LOMCs issued for County or Community
  - Review LOMCs

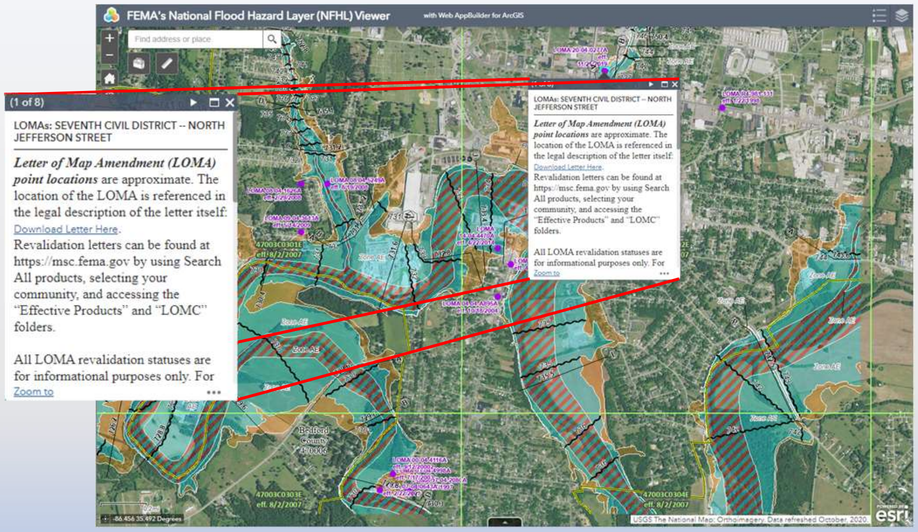
7

Researching Historical Actions

- Step 3 – Contact the FEMA Mapping and Insurance eXchange (FMIX):
  - Only if County or Community and State NFIP Coordinator do not have copies of information you need
  - Request list of and copies of all LOMCs issued for County or Community
  - Review LOMCs
  - https://www.fema.gov/national-flood-hazard-layer-nfhl/ → National Flood Hazard Layer
  - LOMC Determination Documents are also available for download from the Flood Map Service Center https://msc.fema.gov/portal/home

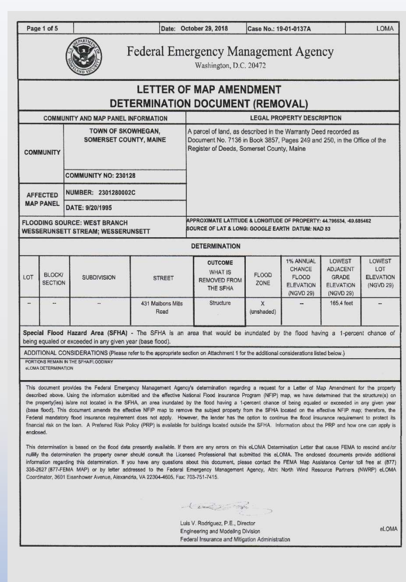
8

Researching Historical Actions



9

Researching Historical Actions



Page 1 of 5		Date: October 29, 2018	Case No.: 19-01-0137A	LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	TOWN OF SKOWHEGAN, SOMERSET COUNTY, MAINE	A parcel of land, as described in the Warranty Deed recorded as Document No. 7136 in Book 3857, Pages 249 and 250, in the Office of the Register of Deeds, Somerset County, Maine
	COMMUNITY NO: 230128	
AFFECTED MAP PANEL	NUMBER: 2301280002C	
	DATE: 9/20/1995	
FLOODING SOURCE: WEST BRANCH WESSERUNSETT STREAM; WESSERUNSETT		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 44.796634, -69.685462 SOURCE OF LAT & LONG: GOOGLE EARTH DATUM: NAD 83

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NGVD 29)	LOWEST ADJACENT GRADE ELEVATION (NGVD 29)	LOWEST LOT ELEVATION (NGVD 29)
--	--	--	431 Malbons Mills Road	Structure	X (unshaded)	--	165.4 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.)

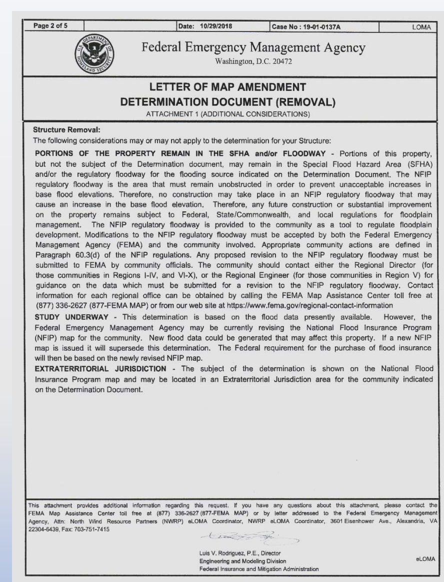
PORTIONS REMAIN IN THE SFHA/FLOODWAY
eLOMA DETERMINATION

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). This document amends 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. If there are any errors on this eLOMA Determination Letter that cause FEMA to rescind and/or nullify the determination the property owner should consult the Licensed Professional that submitted this eLOMA. 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, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, 3601 Eisenhower Avenue, Alexandria, VA 22304-4605, Fax: 703-751-7415.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

eLOMA



Page 2 of 5		Date: 10/29/2018	Case No : 19-01-0137A	LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)
ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

Structure Removal:
The following considerations may or may not apply to the determination for your Structure:

PORTIONS OF THE PROPERTY REMAIN IN THE SFHA and/or FLOODWAY - Portions of this property, but not the subject of the Determination document, may remain in the Special Flood Hazard Area (SFHA) and/or the regulatory floodway for the flooding source indicated on the Determination Document. The NFIP regulatory floodway is the area that must remain unobstructed in order to prevent unacceptable increases in base flood elevations. Therefore, no construction may take place in an NFIP regulatory floodway that may cause an increase in the base flood elevation. Therefore, any future construction or substantial improvement on the property remains subject to Federal, State/Commonwealth, and local regulations for floodplain management. The NFIP regulatory floodway is provided to the community as a tool to regulate floodplain development. Modifications to the NFIP regulatory floodway must be accepted by both the Federal Emergency Management Agency (FEMA) and the community involved. Appropriate community actions are defined in Paragraph 60.3(d) of the NFIP regulations. Any proposed revision to the NFIP regulatory floodway must be submitted to FEMA by community officials. The community should contact either the Regional Director (for those communities in Regions I-IV, and VI-X), or the Regional Engineer (for those communities in Region V) for guidance on the data which must be submitted for a revision to the NFIP regulatory floodway. Contact information for each regional office can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at https://www.fema.gov/regional-contact-information

STUDY UNDERWAY - This determination is based on the flood data presently available. However, the Federal Emergency Management Agency may be currently revising the National Flood Insurance Program (NFIP) map for the community. New flood data could be generated that may affect this property. If a new NFIP map is issued it will supersede this determination. The Federal requirement for the purchase of flood insurance will then be based on the newly revised NFIP map.

EXTRATERRITORIAL JURISDICTION - The subject of the determination is shown on the National Flood Insurance Program map and may be located in an Extraterritorial Jurisdiction area for the community indicated on the Determination Document.

This attachment provides additional information regarding this request. If you have any questions about this attachment, 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, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

eLOMA

10

LOMC Issuance and Distribution

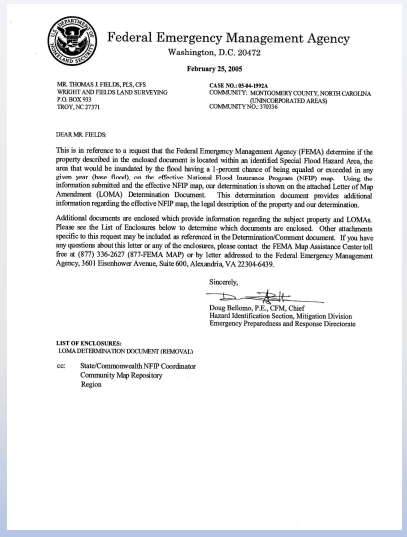
11

LOMC Issuance

- CFS-processed LOMCs will be issued following standard FEMA procedures
- CFS-processed LOMCs will not look any different or include any additional data than standard LOMCs

12

What Does a LOMA Look Like?



Federal Emergency Management Agency
Washington, D.C. 20472

February 25, 2005

MR. THOMAS J. FIELDS, PLS, CFS
WRIGHT AND FIELDS LAND SURVEYING
P.O. BOX 933
TROY, NC 27371

CASE NO.: 05-04-1992A
COMMUNITY: MONTGOMERY COUNTY, NORTH CAROLINA (UNINCORPORATED AREAS)
COMMUNITY NO.: 370336

DEAR MR. FIELDS:

This is in reference to a request that the Federal Emergency Management Agency (FEMA) determine if the property described in the enclosed document is located within an identified Special Flood Hazard Area, the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), on the effective National Flood Insurance Program (NFIP) map. Using the information submitted and the effective NFIP map, our determination is shown on the attached Letter of Map Amendment (LOMA) Determination Document. This determination document provides additional information regarding the effective NFIP map, the legal description of the property and our determination.

Additional documents are enclosed which provide information regarding the subject property and LOMAs. Please see the List of Enclosures below to determine which documents are enclosed. Other attachments specific to this request may be included as referenced in the Determination/Comment document. If you have any questions about this letter or any of the enclosures, 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, 3601 Eisenhower Avenue, Suite 600, Alexandria, VA 22304-6439.

Sincerely,

Doug Bellomo, P.E., CFM, Chief
Hazard Identification Section, Mitigation Division
Emergency Preparedness and Response Directorate

LIST OF ENCLOSURES:
LOMA DETERMINATION DOCUMENT (REMOVAL)

cc: State/Commonwealth NFIP Coordinator
Community Map Repository
Region

Cover Letter

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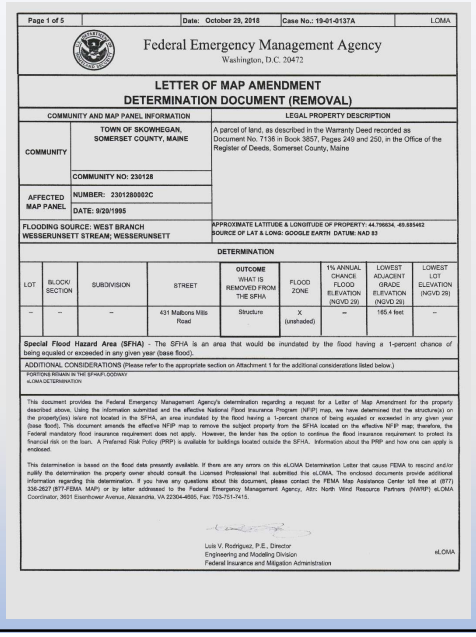
Sample Determination Document



Page 1 of 5 | Date: October 29, 2018 | Case No.: 19-01-0137A | LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

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DETERMINATION DOCUMENT (REMOVAL)

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	COMMUNITY NO: 230128	
AFFECTED MAP PANEL	NUMBER: 2301280002C	
	DATE: 9/29/1995	
FLOODING SOURCE: WEST BRANCH WESSERUNSETT STREAM; WESSERUNSETT		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 44.799834, -69.885462 SOURCE OF LAT & LONG: GOOGLE EARTH DATUM: NAD 83

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NGVD 29)	LOWEST ADJACENT GRADE ELEVATION (NGVD 29)	LOWEST LOT ELEVATION (NGVD 29)
–	–	–	431 Malbons Mills Road	Structure	X (unshaded)	–	165.4 feet	–

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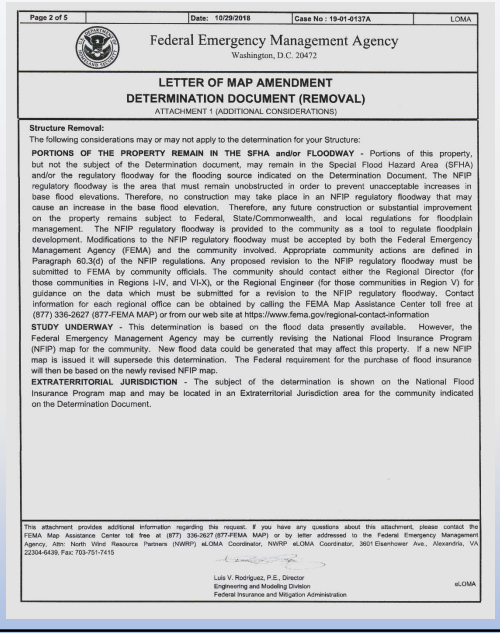
Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

eLOMA



Page 2 of 5 | Date: 10/29/2018 | Case No.: 19-01-0137A | LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

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Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

eLOMA

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LOMA Distribution

- Applicant
- Property Owner (if not Applicant)
- Community Map Repository
- State NFIP Coordinator
- Community or governmental unit that requests LOMA
- FEMA's community files

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LOMR-F Distribution

- Community's Chief Executive Officer (CEO)
- Applicant
- Property Owner (if not Applicant)
- Community Map Repository
- State NFIP Coordinator
- Community or governmental unit that requests LOMR-F
- FEMA's community files

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State and Local Considerations

- LOMAs and LOMR-Fs only remove mandatory Federal requirement for flood insurance:
  - State and/or local floodplain management requirements may still apply
  - Lenders may still require flood insurance even after LOMA or LOMR-F is issued; this protects their financial interests

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FEMA's Role in CFS Submittals

18

Submission to FEMA

- Complete case file can be submitted by standard mail or overnight service
- Complete case file may also be submitted using FEMA's Online LOMC Portal

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Coordination with FEMA

- Contact FEMA Mapping and Insurance eXchange (FMIX) for general assistance
- Phone: 877-336-2627 (877-FEMA MAP)
- E-mail: FEMA-FMIX@fema.dhs.gov
- Chat: available through website
  - https://www.floodmaps.fema.gov/fhm/fmx_main.html

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Once Request is Received

- Acknowledgement letter will be mailed to CFS when request is received
- Request will be reviewed to ensure all applicable data are submitted
- Request will be checked for accuracy

21

Once Request is Received

- If complete and accurate, request will be entered into FEMA's Mapping Information Platform
- Will be submitted to FEMA for final approval
- Copies of LOMC will be mailed to requestor and any other applicable parties 60-90 days from receipt of request with all necessary information
- Determinations will not be available over phone or email

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CFS Support

- FEMA Mapping and Insurance eXchange (FMIX)
  - 1-877-FEMA MAP | (877) 336-2627
  - FEMA-FMIX@fema.dhs.gov
  - Live Chat: (https://www.floodmaps.fema.gov/fhm/fmx_main.html)
- FEMA – for information not available through FMIX (www.fema.gov)

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FEMA Resources/Publications

- MT-1 Technical Guidance December 2020
- Answers to Questions About the National Flood Insurance Program booklet
- How to Read a Flood Insurance Rate Map Tutorial
- Procedure Memorandum 41: North American Vertical Datum of 1988 (NAVD88) Policy
- NFIP Regulations found at: (https://www.govinfo.gov/app/details/CFR-2020-title44-vol1/context)

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Guidance for Flood Risk Analysis and Mapping

MT-1 Technical Guidance

November 2022

FEMA

Affected Section or Subsection	Date	Description
Section 1	Nov. 2022	Listed specific CFR sections for relevant regulations.
Section 2, 2.4	Nov. 2022	Added language to clarify that MT-1 documents issued by FEMA are not permits and should not be considered approval that all State and local requirements have been met.
Sections 2 and 3	Nov. 2022	Added exclusions for when the MT-1 process cannot be used, including properties located on a Primary Frontal Dune (PFD), reviews within suspended or non-participating communities, and reviews for which potential compliance issues are identified.
Section 2.2	Nov. 2022	Added provisions for cases which may require the MT-2 application process.
Section 3.4	Nov. 2022	Added scenario for when site survey may be required when a structure is in the vicinity of a regulatory floodway or CHHA.
Section 3.5, 4, 4.8	Nov. 2022	Added clarification for determining elevations when the metes and bounds follow the top of a retaining wall.
Section 4.1	Nov. 2022	Added provisions for large subjects (5 acres or 50 lots) in approximate Zone A SFHAs.
Section 4.7	Nov. 2022	Incorporated provisions for when a structure built within a Zone AO SFHA can be removed.
Sections 4.1, 4.11 and 6.0	Nov. 2022	Updated to remove potentially outdated information related to insurance.
Sections 3.2, 5.0, 6.0	Nov. 2022	Implemented lower-case capitalization of "lidar" for consistency with style guide.
All sections	Nov. 2022	Implemented various minor updates for consistency and clarity.

25

eLOMA

- Web-based application to process LOMA requests
- LOMA cases located within a coastal zone (Zone V), an alluvial fan, or modified by fill to raise the elevation **do not qualify**
- Only available to licensed land surveyors and professional engineers (Licensed Professionals)
- Allows determinations to be returned in minutes

NSPS

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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.

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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

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CFS Certification Renewal

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CFS Certification Renewal

- Certification renewal will be required every 2 years
- A 4-hour (½-day) training course will be provided for renewal
- This class will count for 4 PDHs
- Attendance is mandatory for CFS certification renewal
- NSPS will maintain list of certified surveyors and will update as surveyors receive CFS certification renewal or lose certification by not attending renewal course

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Conclusion

- You should:
  - Understand details of LOMAs and LOMR-Fs
  - Be able to understand and complete MT-1 or MT-EZ forms
  - Be aware of data requirements necessary to process LOMAs and LOMR-Fs
  - Understand LOMC processing procedures

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Conclusion

- You should also:
  - Know procedures for FEMA review, issuance, and coordination
  - Be aware of how CFS progress will be tracked
  - Understand CFS Certification Renewal
  - Have an understanding of CFS certification
  - Understand differences between map actions and letter actions
  - Understand differences between different types of letter actions

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Questions?

33

Quiz

34

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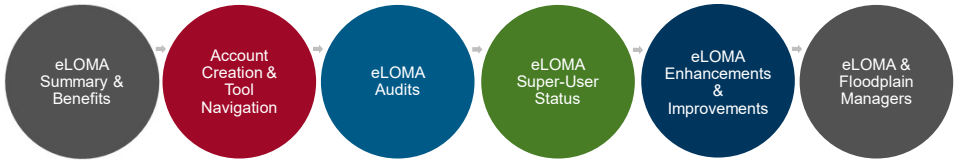
Module 9

eLOMA: A Tool to Simplify LOMAs

FEMA

Today's Agenda



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Benefits of eLOMA

FAST & EASY

- Receive a **LOMA 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

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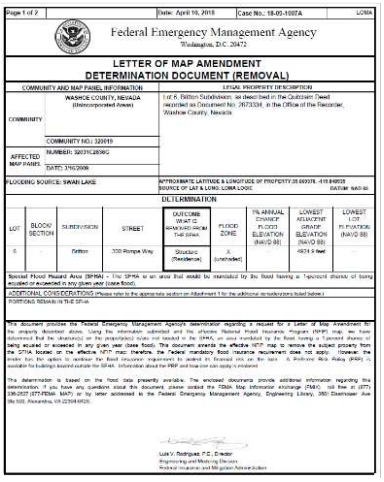
REFRESHER
What is a Letter of Map Amendment (LOMA)?

- A letter from FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the 1-percent-annual-chance flood.
- FEMA removes the Special Flood Hazard Area (SFHA) designation from the subject and removes the Federal requirement for flood insurance.
- Lender can still require flood insurance.



Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

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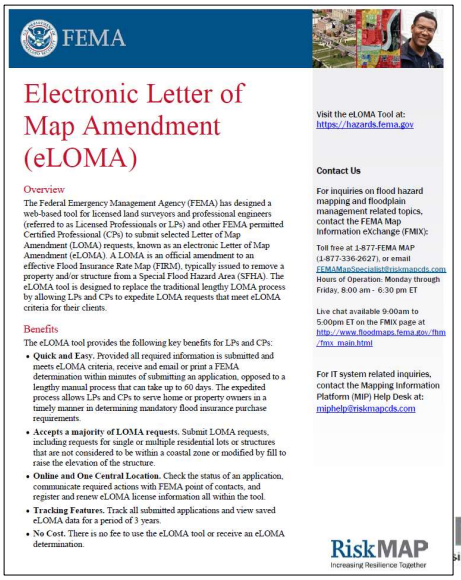
eLOMA and Who Can Use It

- A MIP-based system for submitting and issuing simple LOMAs
- Designed to replace traditional process for simple LOMAs
- Used by Licensed Professionals (LPs) including licensed land surveyors, professional engineers & National Flood Determination Association (NFDA) Certified Professionals (CPs)



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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@riskmapcds.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

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

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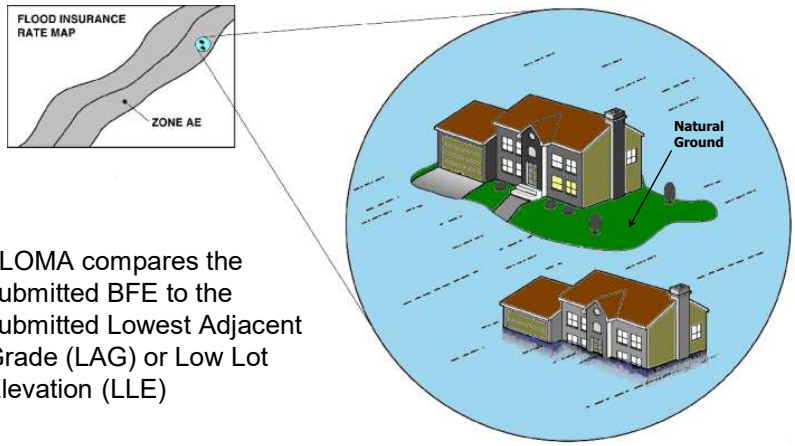
eLOMA vs. Other Submission Methods

- An eLOMA determination serves the same functions as a standard LOMA completed via the Online LOMC tool or the MT-EZ or MT-1 paper forms submitted by mail.
- eLOMA is available to a select group of professionals where online LOMC and paper forms are available to any applicant, including individual home- or property-owners who wish to submit a LOMA.
- An eLOMA determination can potentially be instant vs.a LOMA determination via Online LOMC or the MT-EZ or MT-1 paper form which may take up to 60 days to process.
- eLOMA tool expedites the electronic transfer and tracking of a LOMA request by requiring less printing and mailing of supporting data.

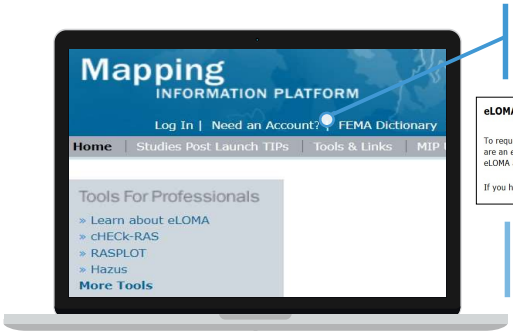
How eLOMA Makes a Determination



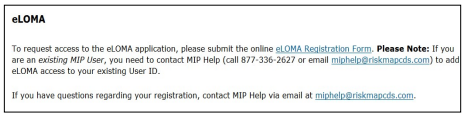
- eLOMA compares the submitted BFE to the submitted Lowest Adjacent Grade (LAG) or Low Lot Elevation (LLE)

Get an Account

FEMA's Mapping Information Platform
hazards.fema.gov/femaportal/wps/portal



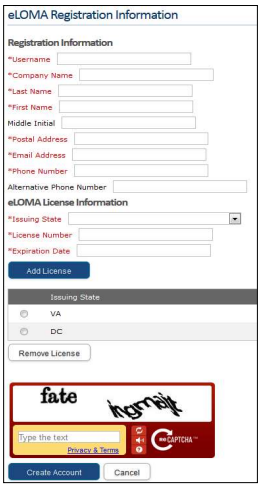
Select **Need an Account?**



Select **eLOMA Registration Form**

Easy Account Creation for LPs

- Enter required registration and license information
  - Select Add License
- For multiple licenses, add the license information for each State the active license is issued
  - Use the Remove License button to remove an added license by selecting the appropriate radio button next to the relevant State
- Complete the reCAPTCHA test and select Create Account



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ACCOUNT CREATION
Certified Professionals

- **National Flood Association (NFA) CPs must be permitted by FEMA**
- **Coordinate with NFA Registration Coordinator to obtain license information during account creation**
- **Elevations certified by PLS or PE are still required**

NFA NATIONAL FLOOD ASSOCIATION
EDUCATE. INFORM. COLLABORATE.

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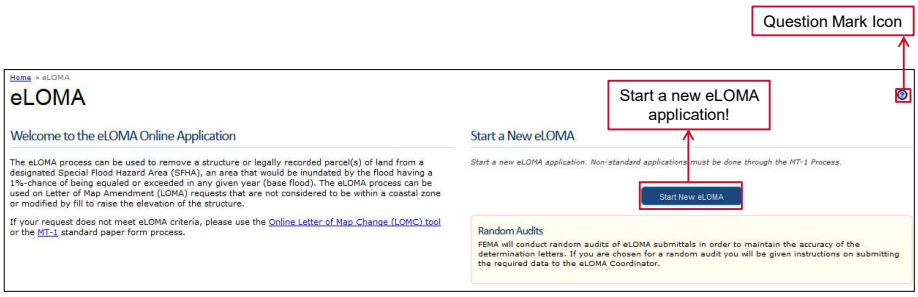
Start Application on eLOMA Homepage

- On the eLOMA Homepage, you can start a new application or resume an incomplete, saved application
- Use the Question Mark icon to access help text



Required Data

- **USER ENTERS ALL APPLICABLE DATA**
  - Legal property description
  - Requester information
  - Community information (CID number, etc…)
  - Map panel information
  - Latitude and longitude coordinates
  - Elevation information
  - Subject information
  - BFE (calculated using FIS report/FIS Flood Profile)

Submit Application

APPLICATION IS APPROVED WITHOUT AUDIT

LP or CP is notified and can sign in & print determination

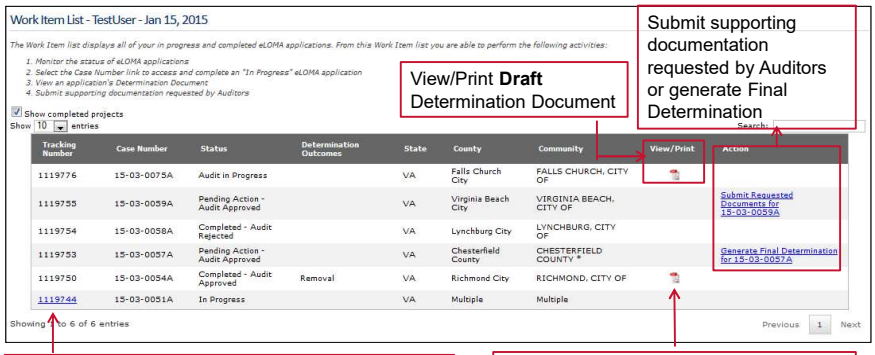
OR

APPLICATION IS FLAGGED FOR AUDIT

- LP or CP is notified via email
- Auditor can approve application
- Auditor can request additional data from the LP or CP
- Auditor can reject application

Check Your Work Item List

- Depending on application status, Tracking Number, View/Print, and Action items fields will be updated to reflect any action or result associated with the application.



eLOMA Audits

FEMA conducts random audits of submitted applications in order to maintain accuracy of eLOMA Determination Documents

EVERY new eLOMA user will have their **first** submittal audited

How Audits Work

AUDIT PROCEDURES ENSURE **ACCURACY AND MAINTAIN CONSISTENCY** FOR ALL ISSUED LOMAS

IF APPROVED

The LP will receive an email notification to log in and print the determination.

- Approvals may provide feedback as well for future
- After an initial successful audit, the LP can generate determinations online but is still subject to random audits.

If REJECTED

The LOMA request will be completed by FEMA and the LP will be audited again on the next submittal.

eLOMA Auditor Review

SUPPORTING DATA FROM THE LP MUST BE COMPLETE

01	02	03
FIRM and profile must be annotated properly	Legal description must conform to the FEMA required format	Subject elevations must be referenced to the datum used in the FIRM and in the FIS report

01	02	03
Subject cannot be in Zones V or D	No fill placement	No changes to previous LOMA/eLOMA determination

REQUESTS MUST MEET THE eLOMA CRITERIA

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Common Errors

- **Legal property descriptions that need to be revised**
- **Subject elevations not converted to the datum used on the FIRM and in the Flood Insurance Study (FIS) report**
- **Inaccurate latitude/longitude coordinates**
  - Vital for accurate depiction in National Flood Hazard Layer
- **Lot, block, and subdivision information incorrect or missing**
- **FIRM panel numbers incorrect**
- **Flooding source is incorrect**

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Become an eLOMA Super-User

- **Audit frequency is reduced dramatically**
- **Minimal oversight from FEMA**
- Super-Users are not subjected to many of the automatic audit triggers that other users are
- Even when Super-Users are audited the turnaround time for those audits is typically shorter than it is for other users

User	eLOMA Submittals July 2018 through June 2020	eLOMAs Selected for Audit	% of Total Submittals Audited
Super User 1	375	89	23.7%
Super User 2	379	109	28.8%
Super User 3	112	21	18.8%
Default Users	727	630	86.7%

Table 1: Audit Frequency for Top Three Super-Users vs. Default Users

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How to Become a Super-User

- Once an eLOMA user has demonstrated that they have a comprehensive understanding of the eLOMA application process they are **promoted to Super-User Status.**
- Typically, a user must submit three consecutive eLOMAs that have complete supporting data and that require zero corrections.
- Must use the eLOMA tool on a regular basis.

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Expanding eLOMA Usage

FEMA WILL EXPAND eLOMA USAGE OVER THE NEXT 3 YEARS BY:

Updating the eLOMA training modules in the MIP and implementing a prerequisite new user training

Developing web-based learning opportunities for existing users to expand their understanding of the eLOMA process

Adding more data quality checks and validation

Increasing outreach & focusing on increasing the number of eLOMA super-users within the tool

- Improves tool efficiency by reducing the number of required audits
- Increasing repeat users improves quality
- Saves time and reduces cost

When eLOMA can't be Used: Current Limitations

- No requests involving the placement of fill
- No alluvial fan, coastal flood hazard areas (V zone) or D zones
- No changes to previous LOMA/eLOMA determinations
- No conditional requests for proposed structures

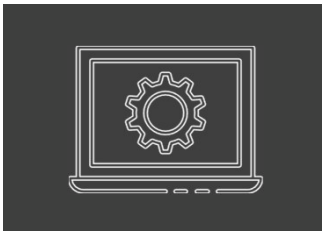
Recent eLOMA Enhancements

Created an eLOMA workflow to improve tracking and support additional LOMC types

Data upload feature added to improve the audit process

Input additional data quality checks and validation

Improved web-based training materials



IMPROVED/ ADDITIONAL FUNCTIONALITY

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eLOMAs and Floodplain Managers

Some Floodplain Mangers have concerns that eLOMAs containing errors could be issued in their community without an audit.

All non-audited eLOMA determination letters are reviewed for noticeable errors.

Incorrect eLOMAs can be rescinded by FEMA and superseded by a standard LOMA.

Errors are often caught before the LP has distributed the final determination letter.

To date, only a very small number of incorrect eLOMAs have warranted a correction LOMA.

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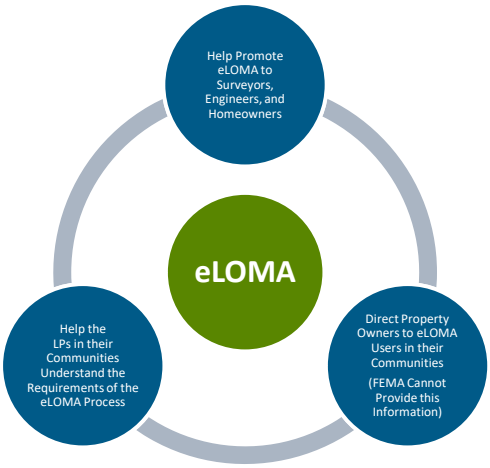
What Floodplain Managers Can Do



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The Future of eLOMA

Increase usage of the eLOMA tool by allowing more requests to be processed using eLOMA

Increase up-front training & outreach efforts to set new users up for success in the tool

Improve the eLOMA process to make it easier for LPs to issue fast and accurate determinations

Save more time and resources for property owners, eLOMA users, and FEMA

Maintain quick audit turnaround times for users, which benefits homeowners and communities as well

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Questions?

eLOMA Coordinator: Dmummert@mbakerintl.com

FEMA: www.fema.gov

Mapping Information Platform (MIP): www.hazards.fema.gov

MIP Help: fema-riskmap-ithelp@fema.dhs.gov

FEMA Mapping and Insurance eXchange (FMIX):
877-FEMA MAP (877-336-2627)
or fema-fmix@fema.dhs.gov

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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.

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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.
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- **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.
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Visit the eLOMA Tool at:
https://hazards.fema.gov

Contact Us

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

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

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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) 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-1paper 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/whatiseloma.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.

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

David Mummert, FEMA eLOMA Coordinator
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). 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 FEMA-FMIX@fema.dhs.gov.

FEMA Approved Format for eLOMA Legal Property Descriptions

Guidelines for writing Legal Property Descriptions

1. Do not copy the legal description directly from the recorded deed. Formats vary widely from community to community which is why FEMA requires the format described below be used for all eLOMAs.

2. Lot, Block, and Subdivision names should only be used for properties that are referred to using the standard Lot, Block, and Subdivision naming convention, e.g. Lot 8, Block C, Maple Acres.

3. Portions of lots are generally not depicted on recorded plats so if a property is described as a portion of a lot in a recorded deed then the Legal Property Description should refer to that recorded deed instead of the recorded plat.

4. If a property is not described by a Lot, Block, and Subdivision in the recorded deed but is described by a detailed metes and bounds, it is best to refer to the property as "A parcel of land, as described in…"

5. Properties are **described** in deeds and **shown** on plats.

6. Do not enter Legal Property Descriptions in all capital letters or all lower case letters (use appropriate capitalization).

7. Use the capitalization and punctuation that is detailed in the examples provided below.

8. If a deed or plat is recorded on more than one page refer to all of the pages in the Legal Property Description, not just the first one.

9. If a deed or plat is recorded with a Document Number or Instrument Number refer to that number along with any Book and Page information.

10. For those subdivisions that include Block and Section numbers (note: these 'Sections' are not the same as the ones in a Section, Township, Range) the Section number should be included in the Legal Property Description. An example would be 'Lot 1, Block B, Maple Acres, Section VII,…"

Steps for writing FEMA approved Legal Property Descriptions

1. Lot, Block, Subdivision, … **OR**
   A portion of Section, Township, Range, Principal Meridian… **OR**
   A parcel of land,… (when there is no Lot, Block, Subdivision or Section/Township/Range/Principal Meridian information for the property)

2. as described in… (for deeds) **OR**
   as shown on… (for plats)

3. the (General Warranty, Joint Tenancy, Survivorship, Quit Claim, etc.) Deed… **OR**
   the Plat…

4. recorded as Document No. #, … **OR**
   recorded as Document No. # in (Book or Liber) #, (Page(s) or Folio) #, (use "and" for 2-3 pages, "through" for 4 or more pages) … **OR**
   recorded in (Book or Liber) #, (Page(s) or Folio) #, (use "and" for 2-3 pages, "through" for 4 or more pages) …

5. in the Office of the (Recorder, or Register of Deeds, or County Clerk, or Clerk of Court, etc.), …

6. City (use in place of the County only if the deed or plat is recorded in the city or town), …

7. County/Parish, …

8. State

Examples

Lot 81, Block 16, Westover Addition, Section 2, as described in the Warranty Deed recorded as Document No. 9907582 in Book 238, Pages 733 through 736, in the Office of the Clerk of Court, Jackson County, Indiana

A parcel of land, as described in the Deed recorded in Book 238, Pages 733, 734, and 735, in the Office of the Recorder, Jackson County, Indiana

A portion of Section 31, Township 25 North, Range 15 East, 3rd Principal Meridian, as described in the Quit Claim Deed recorded as Instrument No. 9902 in Liber 238, Folio 733, in the Office of the Register of Deeds, City of Jackson, Indiana

Lot 81, Block 16, Westover Addition, Section 2, as shown on the Plat recorded as Document No. 9907582 in Book 238, in the Office of the Clerk of Circuit Court, Jackson County, Indiana

A portion of Section 31, Township 25 North, Range 15 East, 3rd Principal Meridian, as described in the Warranty Deed recorded in Liber 238, Folio 733, in the Office of the Recorder, Jackson County, Indiana

Lot 81, Block 16, Westover Addition, Section 2, as shown on the Plat recorded in Book 7, Pages 733 and 734, in the Office of the Register of Deeds, Jackson County, Indiana

FEMA

Electronic Letter of Map Amendment (eLOMA) Training Tutorial

March 2015

RiskMAP

Increasing Resilience Together

What's Inside

In this tutorial you will find:

- Information about the eLOMA application tool and whether the tool is right for you
- eLOMA application criteria and the determination process
- A step-by-step guide through the eLOMA submission process
- Additional eLOMA user resources

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Introducing eLOMA: Overview and Users

eLOMA is a Mapping Information Platform (MIP) web-based tool for users to submit selected Letter of Map Amendment (LOMA) requests, known as an electronic Letter of Map Amendment (eLOMA)

- Designated for licensed land surveyors and professional engineers (referred to as Licensed Professionals or LPs) and other FEMA permitted National Flood Determination Association (NFDA) Certified Professionals (CPs)
- Replaces the traditional LOMA process by allowing LPs and CPs to expedite LOMA requests that meet eLOMA criteria for their clients

Introducing eLOMA: eLOMA Criteria

What kind of LOMAs can LPs and CPs submit?

- eLOMA accepts all **LOMA** requests that are not:
  - Considered within a coastal zone (Flood Zone V) or an alluvial fan
  - Modified by fill to raise the elevation of the structure
  - Currently being processed by another LOMA application by FEMA
- Additionally, eLOMA 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**) requests

Introducing eLOMA: Benefits

Quick and Easy. Receive and email or print a FEMA determination within minutes of submitting an application, opposed to the manual process that can take up to 60 days

Less Mailing and Printing. Electronic transfer of data allows for no mailing or printing to submit a request to FEMA

Online and One Central Location. Monitor application status, complete required actions with FEMA point of contacts, and register/renew license information all within eLOMA

Tracking Features. Track all submitted applications and view saved eLOMA data for a period of 3 years

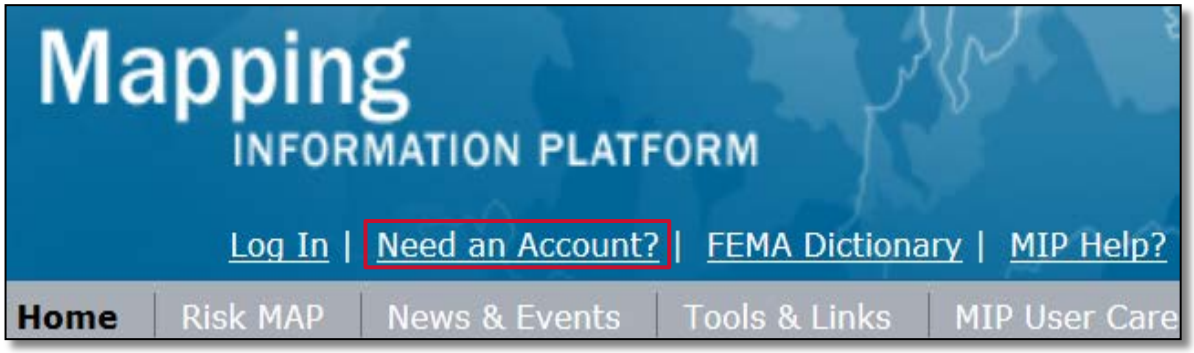
No Cost. Use the tool to receive an eLOMA Determination free of charge

Introducing eLOMA: eLOMA Vs. Other LOMA Submission Processes

- An eLOMA determination serves the same functions as a standard LOMA that was completed via the Online LOMC tool or the MT-EZ or MT-1 paper forms submitted by mail
- Online LOMC and the paper forms are available to any applicant, including home or property owners who wish to submit a Letter of Map Change (LOMC), whereas eLOMA can only be used by a selected group
- 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 and expedites the electronic transfer and tracking of a LOMA request

Account Creation

- Navigate to the Mapping Information Platform (MIP)
- Select **Need an Account?** in the top menu
- Select **eLOMA Registration Form** hyperlink



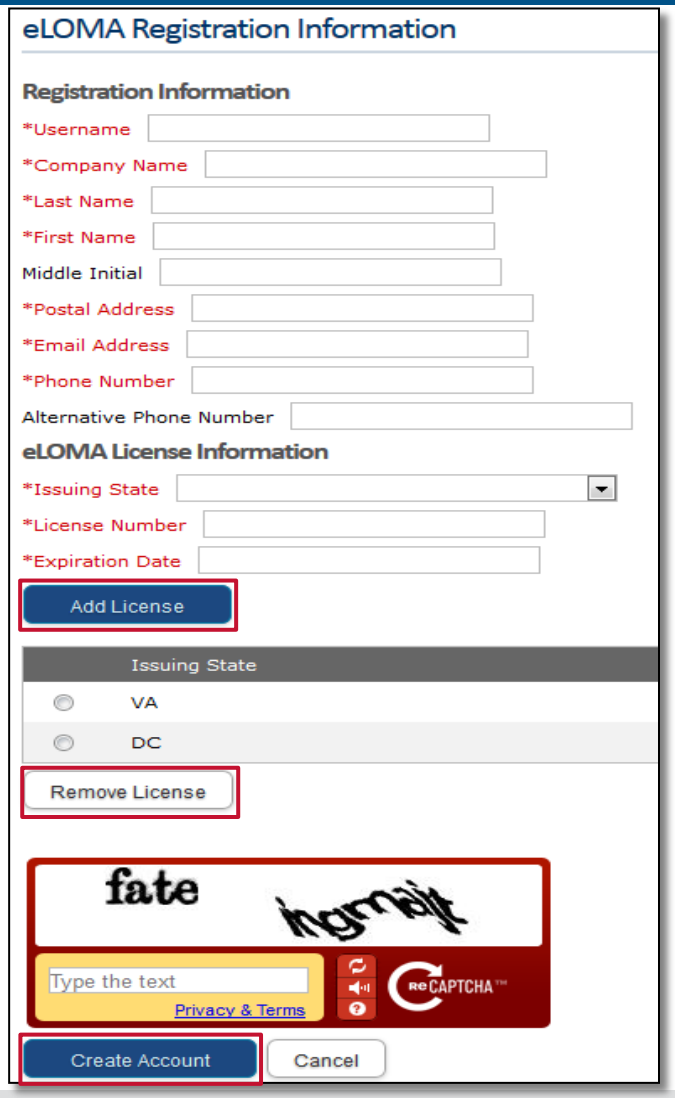
eLOMA

To request access to the eLOMA application, please submit the online eLOMA Registration Form. **Please Note:** If you are an *existing MIP User*, you need to contact MIP Help (call 877-336-2627 or email miphelp@riskmapcds.com) to add eLOMA access to your existing User ID.

If you have questions regarding your registration, contact MIP Help via email at miphelp@riskmapcds.com.

Account Creation: Licensed Professionals

- Enter required registration and license information
  - Select **Add License**
- For multiple licenses, add the license information for each State the active license is issued
  - Use the **Remove License** button to remove an added license by selecting the appropriate radio button next to the entered **Issuing State**
- Complete the reCAPTCHA test and select **Create Account**

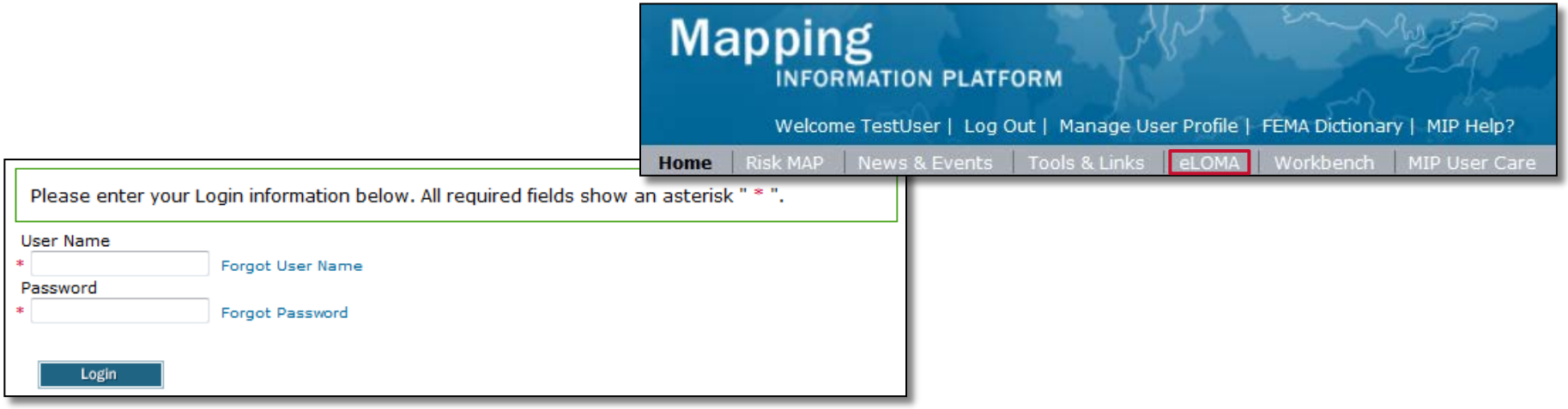


Account Creation: Certified Professionals

- If you are a National Flood Determination Association (NFDA) Certified Professional (CP), your license information will be communicated to you by the appropriate NFDA Registration Coordinator when your eLOMA access registration form is complete

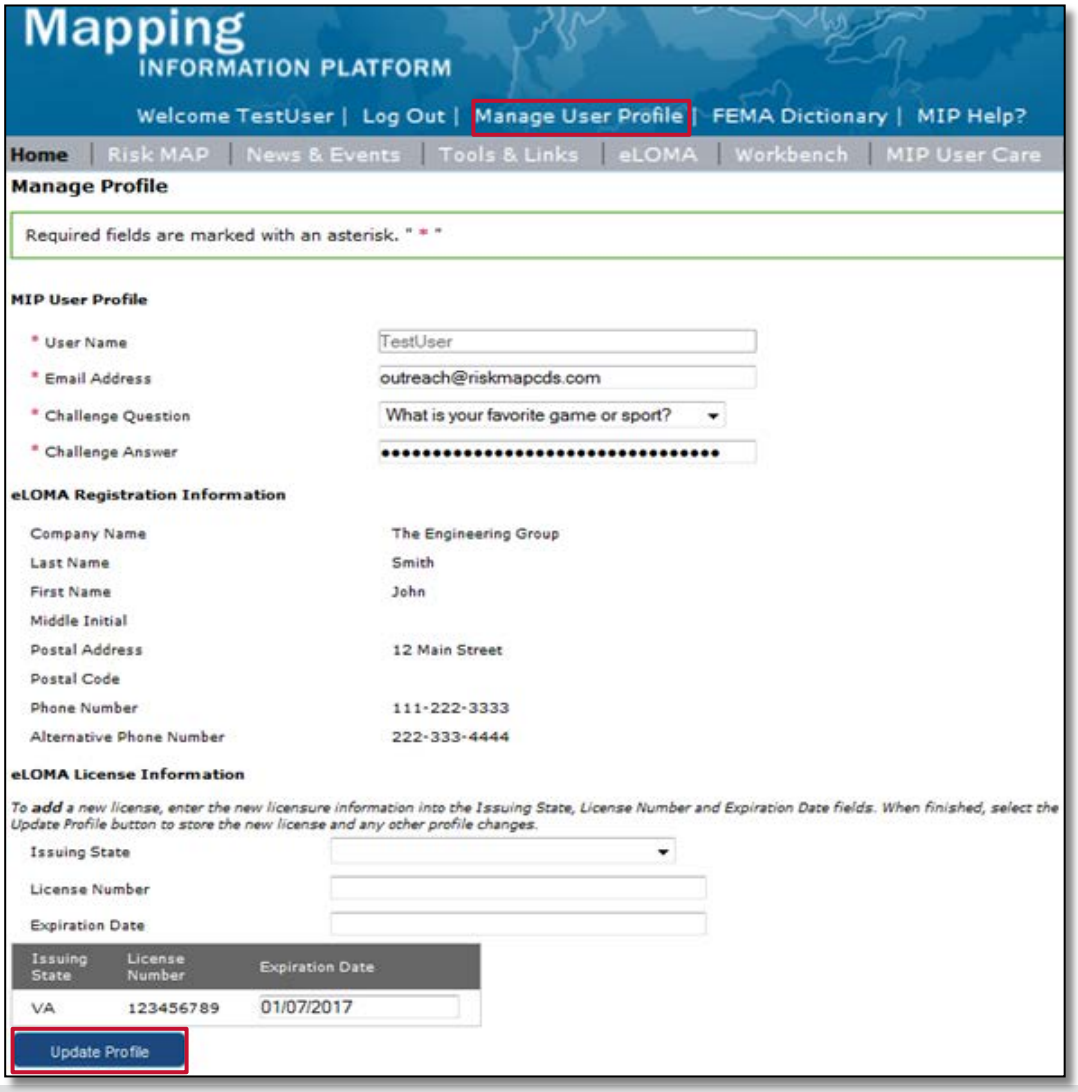
Account Login

- You will receive two email notifications from mip-noreply@riskmapcds.com with your login credentials
- Select **Login In** in the top menu and enter in newly created username and temporary password sent via email
  - First time login users will be prompted to change their password and select a Challenge Question and Answer
- Once logged in, select **eLOMA** in the top menu to access the tool



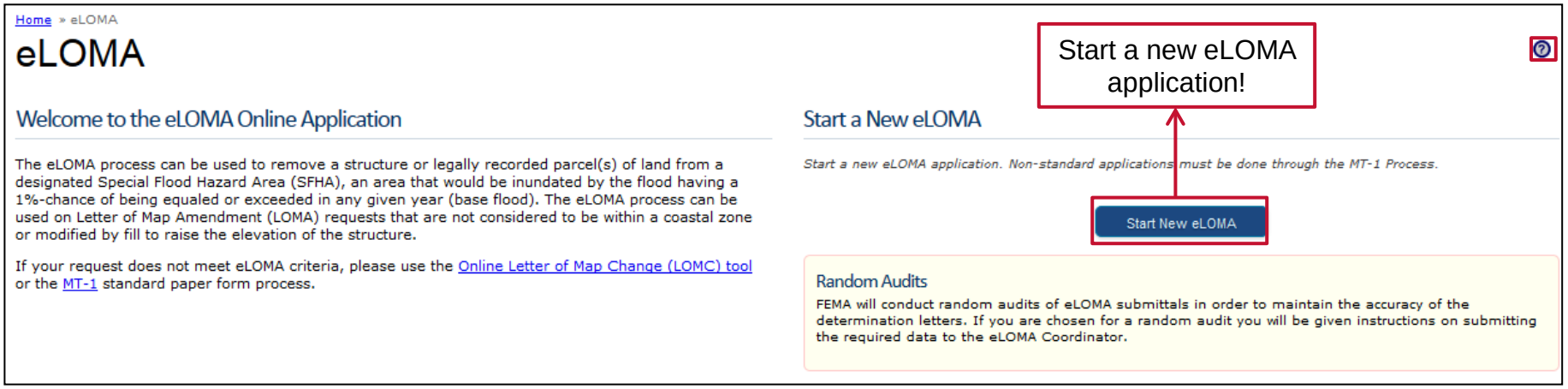
Manage User Profile

- Update your profile by selecting **Manage User Profile** in the top menu
- You may update:
  - Email Address
  - Challenge Question/Answer
  - Expiration Date to existing License(s)
  - Add new license(s) information
- **eLOMA Registration Information** cannot be modified
- Select **Update Profile**



Homepage

- On the Homepage, you may start a new application or resume a previously started and saved application
- FEMA will conduct **Random Audits** of submitted applications in order to maintain accuracy of eLOMA Determination Documents
- Use the **Question Mark** icon to access help text

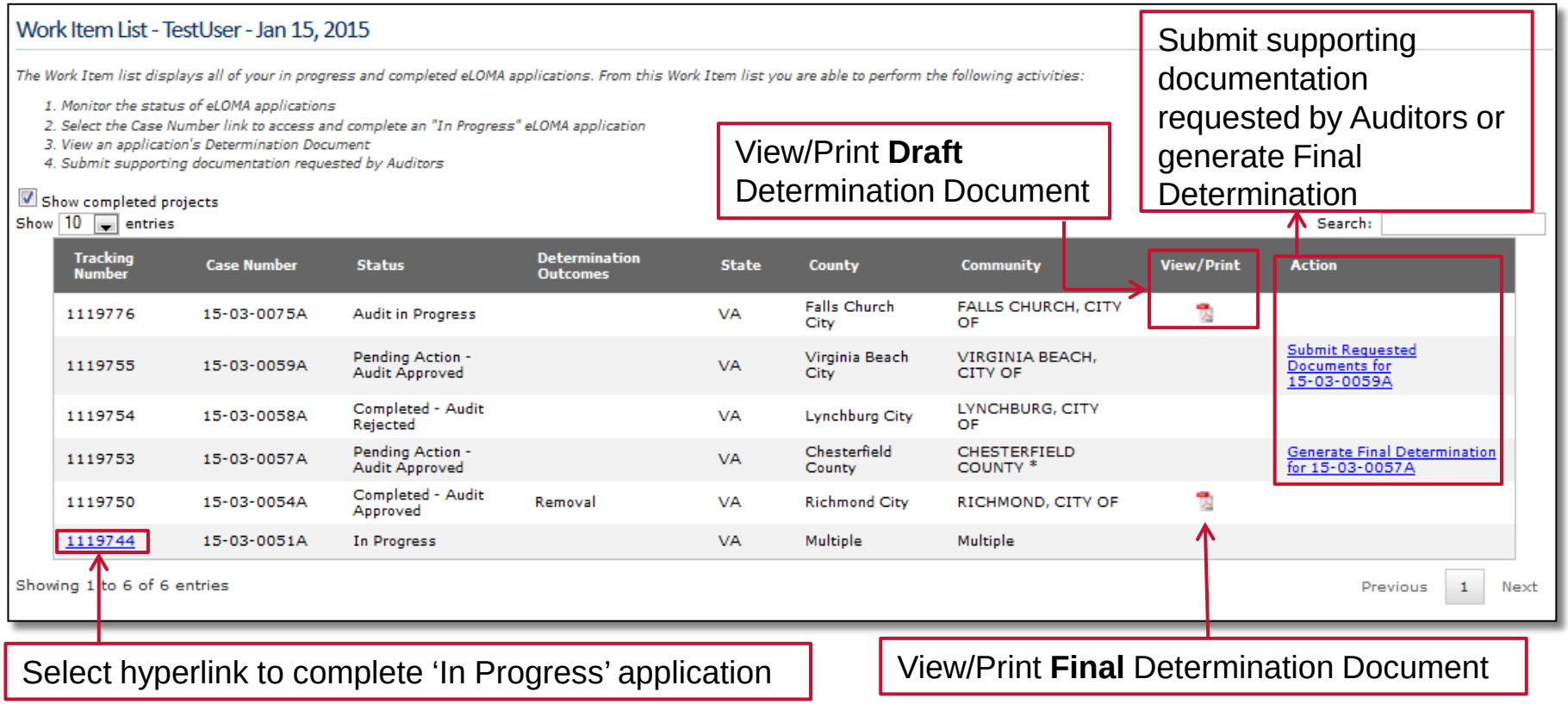


Work Item List

- Table displays all eLOMA applications you started
- You may perform the following activities
  1. Monitor the status of eLOMA applications
  2. Complete an "In Progress" eLOMA application
  3. View an application's Draft or Final Determination Document
  4. Submit supporting documentation requested by Auditors
- Modify the view of the table by:
  1. Selecting **Show completed projects** to view all applications
  2. Using the search bar to display criteria results (i.e., “Audit”, “Richmond”)
  3. Sorting table contents in ascending/descending order by selecting the column header
- Use the **Tracking Number** to monitor application status and complete required actions
- Contact miphelp@riskmapcds.com to remove ‘In Progress’ applications

Work Item List

- Depending on application status, **Tracking Number**, **View/Print, Action** items will be updated accordingly to reflect any action or result associated with the application



Work Item List: Application Status

Status Term	Description
In Progress	An application has been initiated, but not yet submitted.
Audit In Progress	An application has been submitted and in review by an Auditor.
Pending Action- Audit Approved	An application has been submitted, Auditor has approved the audited application and the user must acknowledge the penalty clause and generate the application's Final Determination document.
Completed- Audit Approved	An application has been submitted and the Auditor has approved the audited application. A Final Determination document was generated.
Completed- Audit Rejected	An application has been submitted and the Auditor rejected the audited application. No Final Determination document was generated.
Completed- No Audit	An application has been submitted and does not require an audit. A Final Determination document was generated.

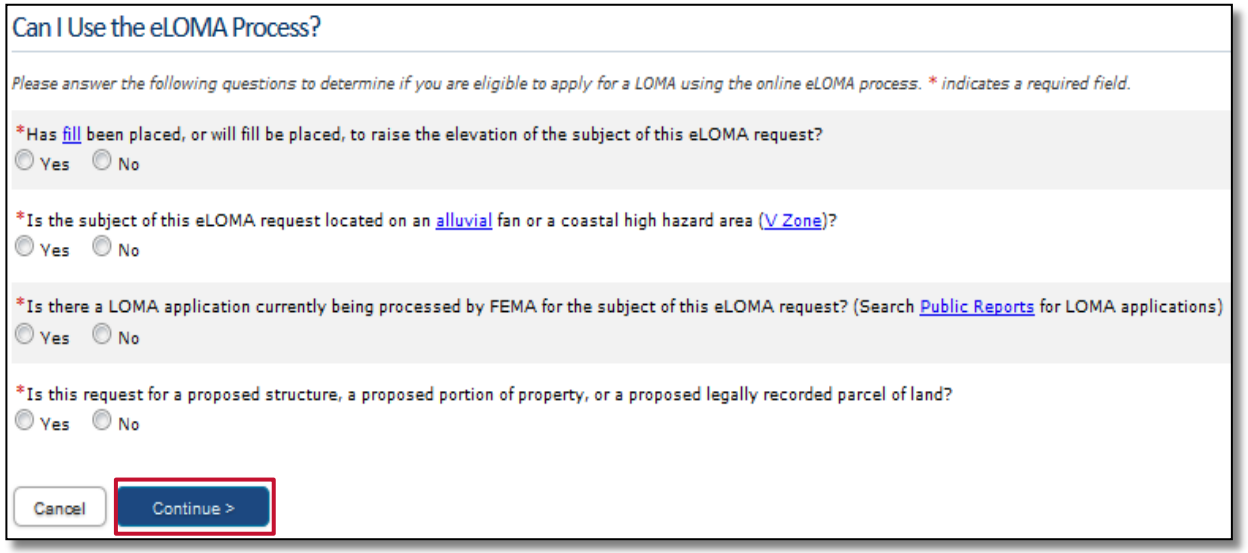
Work Item List: View/Print and Action

- Draft and Final Cover Letter and Determination Documents can be accessed and printed for applications with the appropriate status in the **View/Print** column
  - PDF Draft Cover Letter and Determination Document: Accessible for **Audit In Progress** applications
  - PDF Final Cover Letter and Determination Document: Accessible for **Completed- No Audit** or **Completed - Audit Approved**
- Applications requiring further activity to complete the eLOMA process will display as a hyperlink in the **Action** column
  - **Submit Requested Documents**: Auditor requests additional supporting documentation for your request. Select the hyperlink to view and upload documents requested by Auditor
  - **Generate Final Determination**: Audit has bee approved. Select hyperlink to complete the process and generate a Final Cover Letter and Determination Document

Application Steps

Step 1: Can I Use the eLOMA Process?

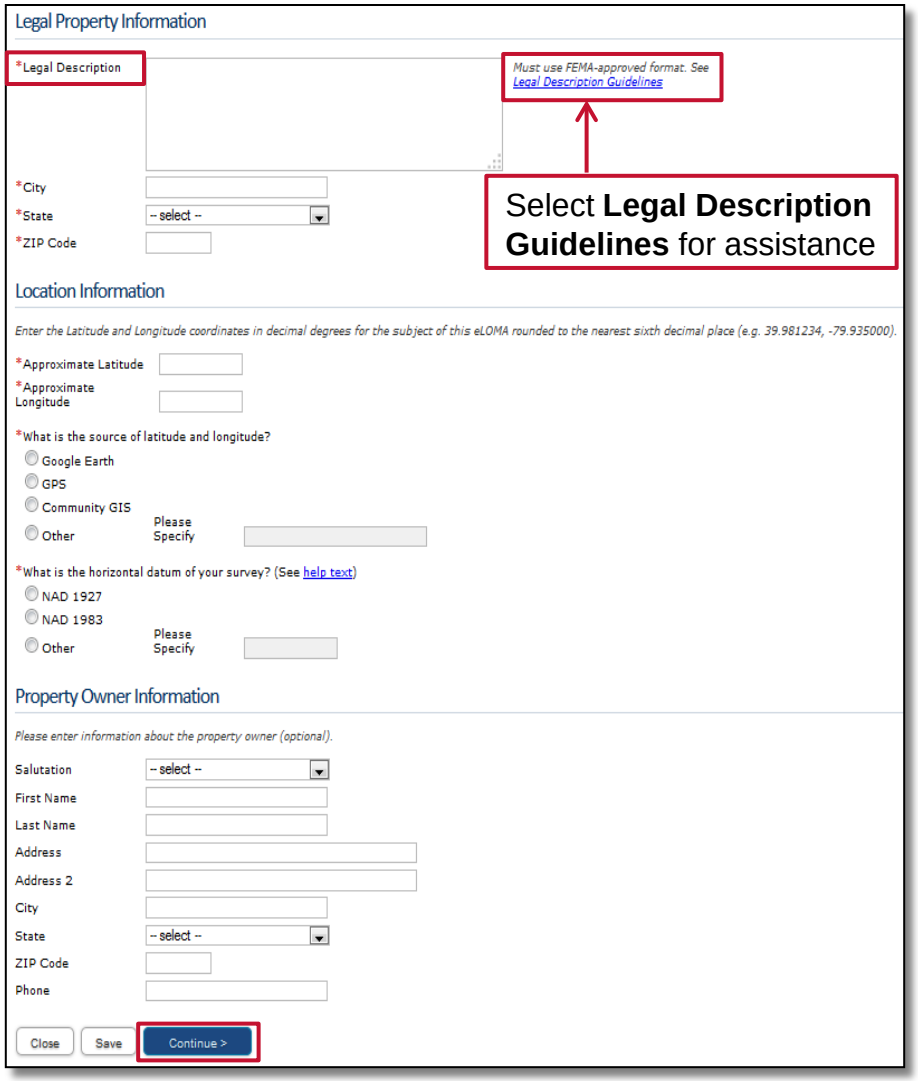
- Answer the pre-qualifying questions and select **Continue**
  - Contact the FEMA Map Information eXchange (FMIX) with additional questions
- You will be directed to another LOMA submission method if the request does not meet criteria qualifications



Application Steps

Step 2: Property Information

- Legal Property Information
  - **Legal Description** must be in a FEMA-approved format
  - **State** will populate with only the states where you have an active license
- If not provided, optional information may be requested at a later date and slow down the application process
- You will receive an email with an application **Tracking Number** when page is saved or continued



Application Steps

Step 3: Subject

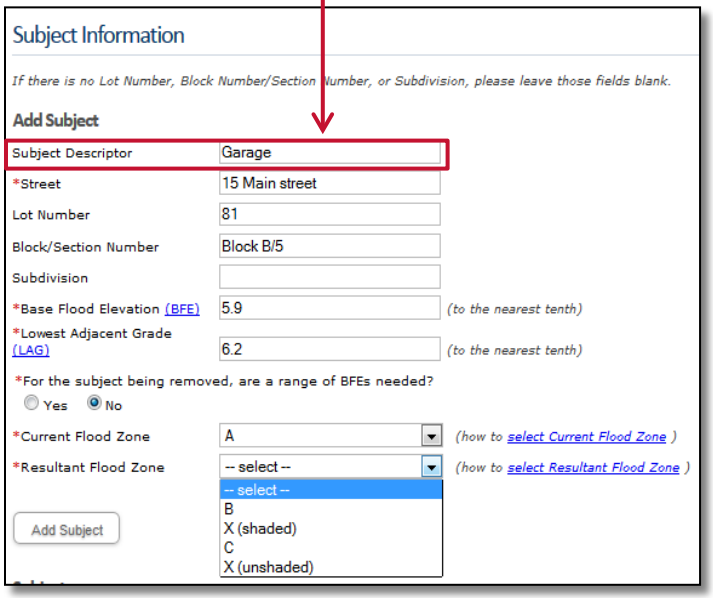
- **Tracking Number** will display in the left hand corner
- Indicate the Subject(s) of your request
  - Specify "single" or "multiple" for the subject type (property, portion, structure)
    - Multiple structures with different construction types, you may use the **Other** field. On the **Subject Info** page, you will have the opportunity to describe the construction type for each structure of your request
    - Multiple structures with different construction dates, use the most recent date the last structure was built
- Select **Continue**

Application Steps

Step 4: Subject Information

- Manually Add Subject OR Upload Multiple Subjects
- Option 1: **Add Subject** via data fields
  - **NOTE:** Use the **Subject Descriptor** to differentiate between structures **OR** multiple metes and bounds portions that share the same street address
    - Examples: Residence, Garage, Barn, Office
    - Field has a 13 character limit
  - Round **BFE** and **Lowest Lot Elevation** (LLE) or **Lowest Adjacent Grade** (LAG) to the nearest tenth
    - Depending on if the subject is a structure or property will dictate whether the LLE or LAG information is entered
    - Entered BFE and LLE/LAG data will determine available Resultant Flood Zone
    - The Resultant Flood Zone must display on the subject's effective FIRM

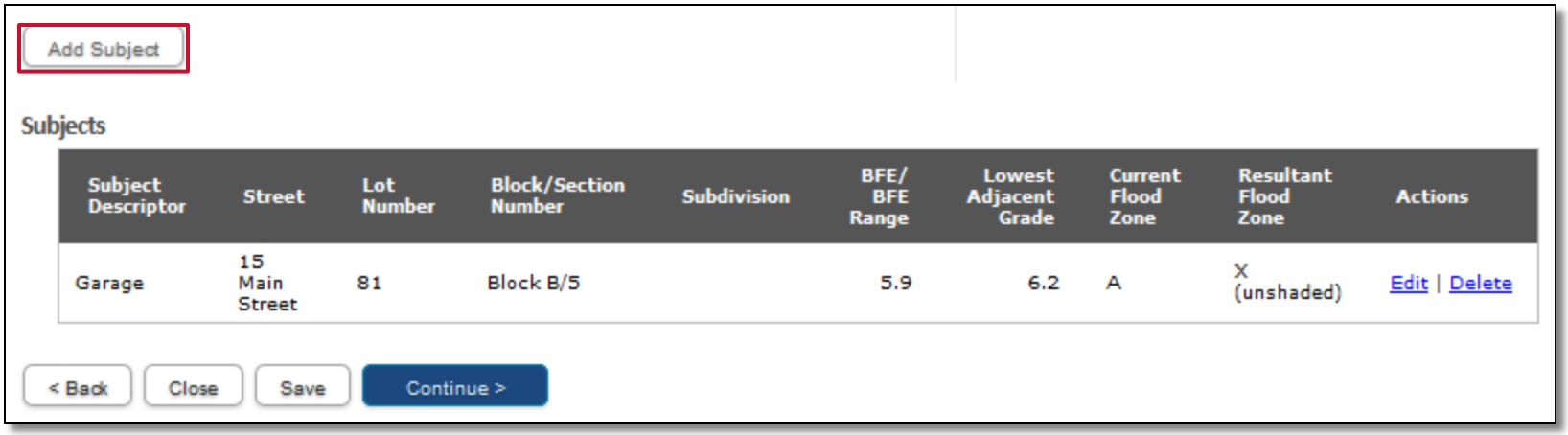
The Subject Descriptor field should only be used when there are multiple structures on one property that share the same address **OR** when there are multiple Metes and Bounds portions of property within a single property.



Application Steps

Step 4: Subject Information

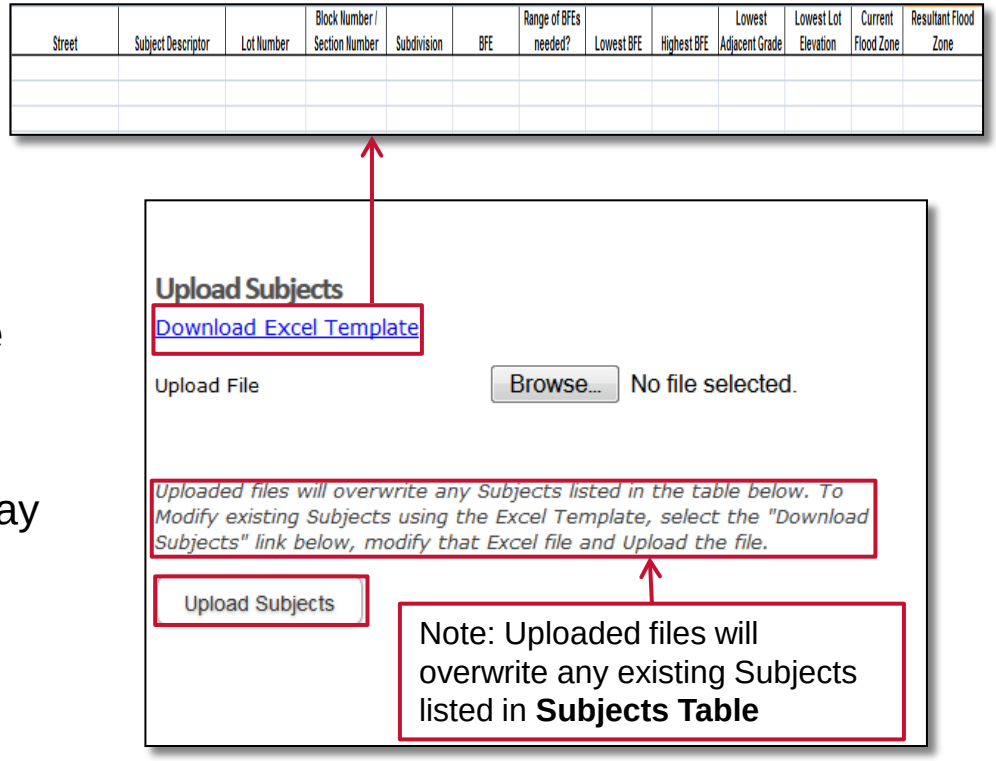
- Select **Add Subject**
- Information will populate in the **Subjects Table**



Application Steps

Step 4: Subject Information

- Option 2: **Upload Multiple Subjects** via Excel Template for multiple subjects
  - Option will not display if a single property or lot is selected
  - Select **Download Excel Template** and enter in subject information
    - If required fields are missing (i.e., Street), an error message will display when attempting to upload the file
  - Save and Upload File
  - Select **Upload Subjects**
  - Excel Template information will populate in the **Subjects Table**



Application Steps

Step 4: Subject Info

- Using the Excel Template
  - Entering **Current Flood Zone** and **Resultant Flood Zone**
    - Flood Zones must be exactly as shown in the the drop down menus: **A, A1-A30, A99, AE, AH, AO, B, X (shaded), C, X (unshaded)**
    - If worded differently (i.e., X (Shaded)), youwill receive an error when attempting to upload the file
  - Determining **Resultant Flood Zone**
    - When BFE> LLE or LAG, then the Available Resultant Flood Zones include: **A, A1-A30, A99, AE, AH, AO**
    - When BFE ≤ LLE or LAG, then the Available Resultant Flood Zones include: **B, X (shaded), C, X (unshaded)**
    - If inputted incorrectly (i.e., B Resultant Flood Zone is entered in for a 5.9 BFE and 4.2 LLE subject area), you will receive an error when attempting to upload the file
  - NOTE: Uploading the Excel Template will overwrite any existing Subjects listed in the **Subjects Table**

Application Steps

Step 4: Subject Info

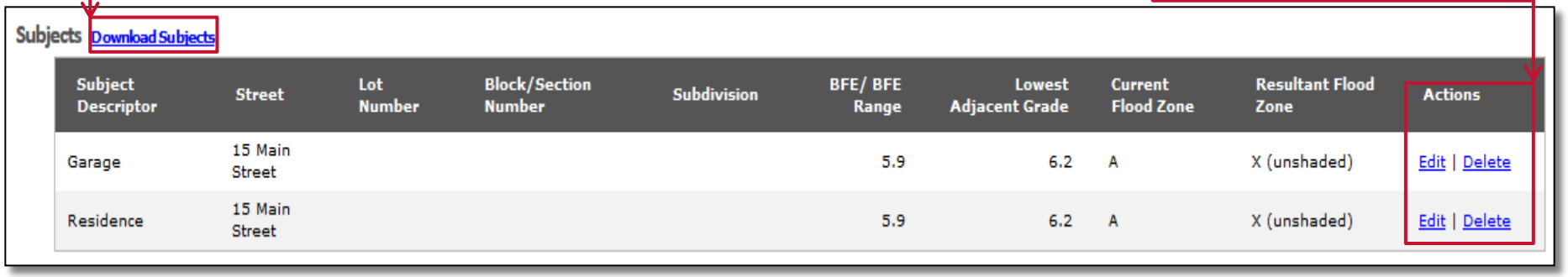
- Updating and/or Adding Subjects
  - Option 1: Use the **Edit l Delete** actions in the **Subjects Table** to update Subjects manually via the data fields

OR,

  - Option 2: Select **Download Subjects** and update information in the Excel Template and re-upload file

Option 2: Update information in Excel Template

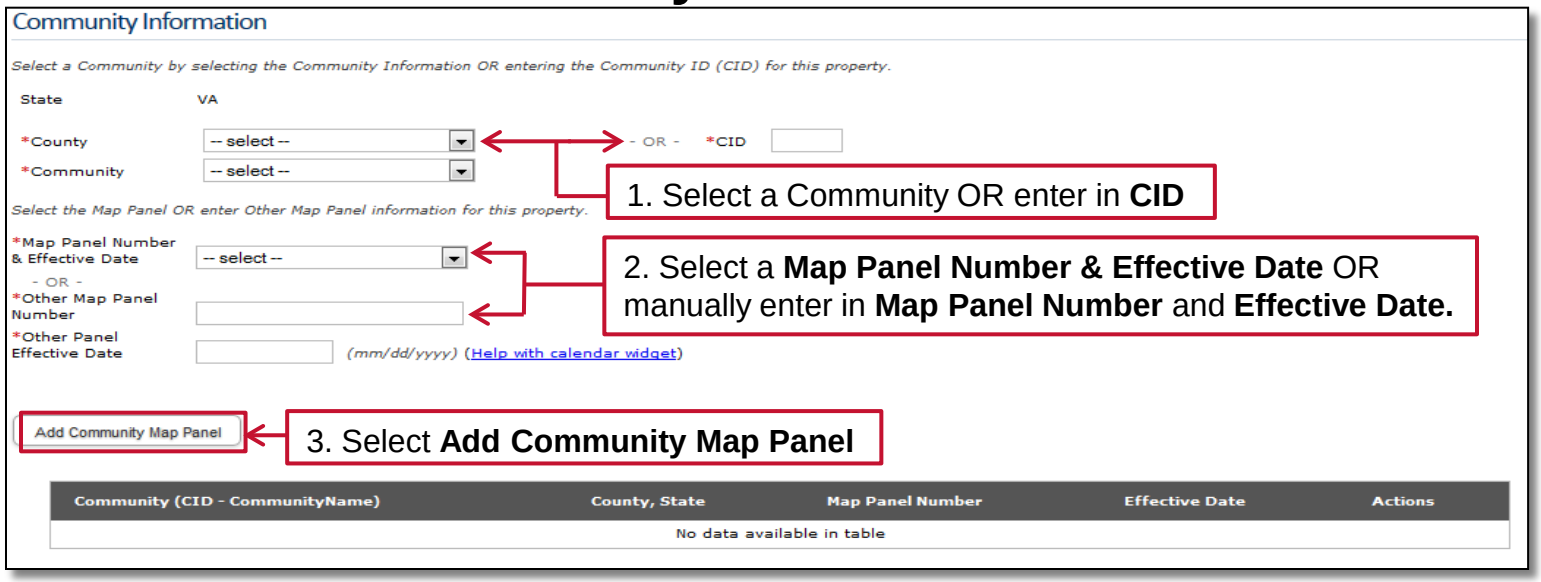
Option1: Update information manually via data fields



Application Steps

Step 5: FIRM Info

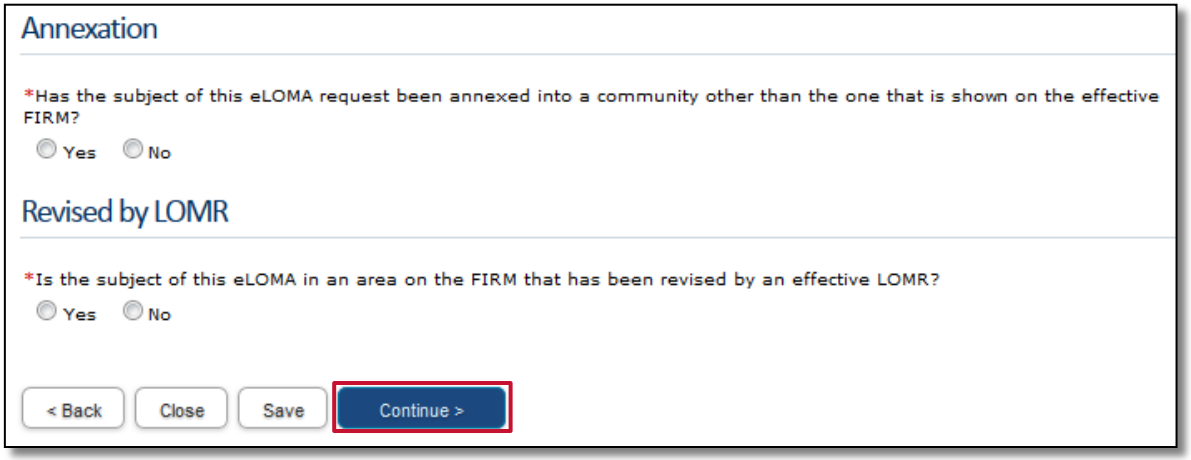
- Select the Community manually OR by Community ID (CID) Number for where the Subject(s) of this request is located and effective Flood Insurance Rate Map (FIRM) Panel(s)
- Select **Add Community Map Panel**, to add the Community information in the **Community Table**



Application Steps

Step 5: FIRM Info

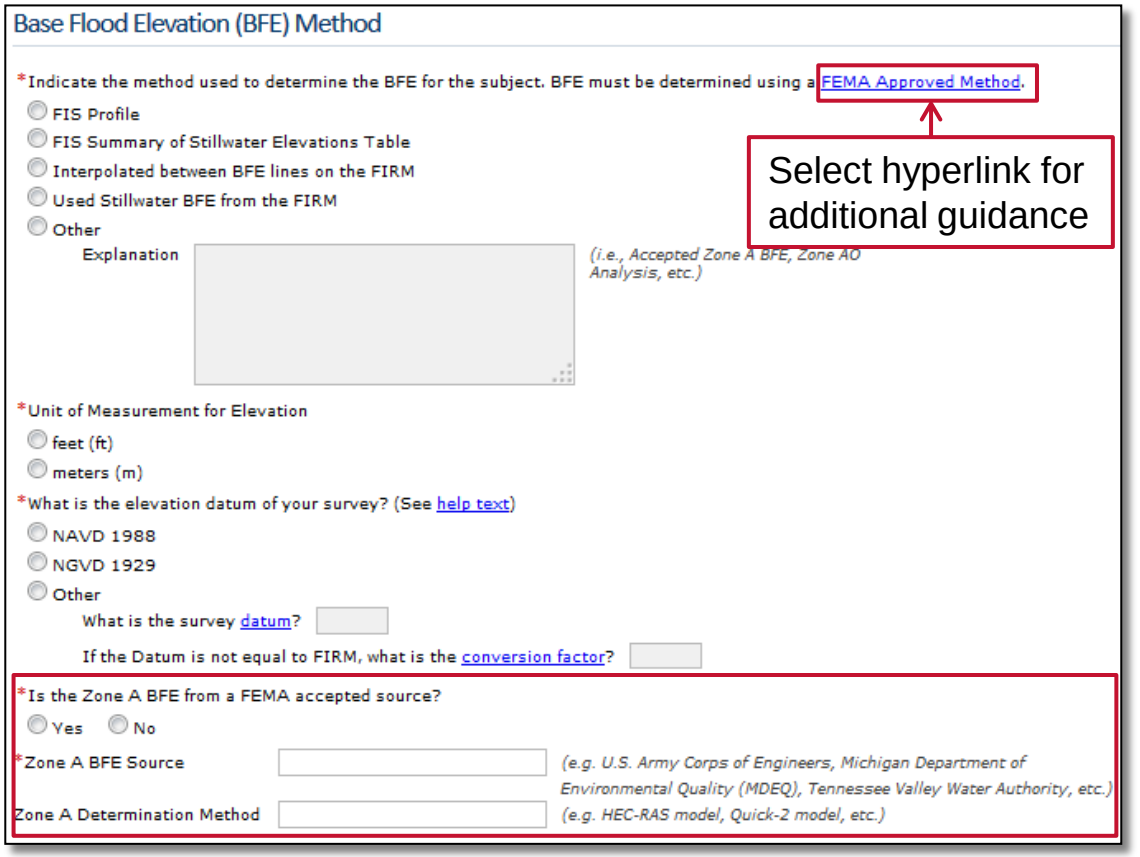
- **Annexation** and **Revised by LOMR**
  - If the subject has been annexed into a community other than the one that it is shown in the effective FIRM panel, select **Yes**
  - Refer to FEMA's Map Service Center (MSC) to determine if the subject was revised by an effective LOMR
- Select **Continue**



Application Steps

Step 6: Elevation Info

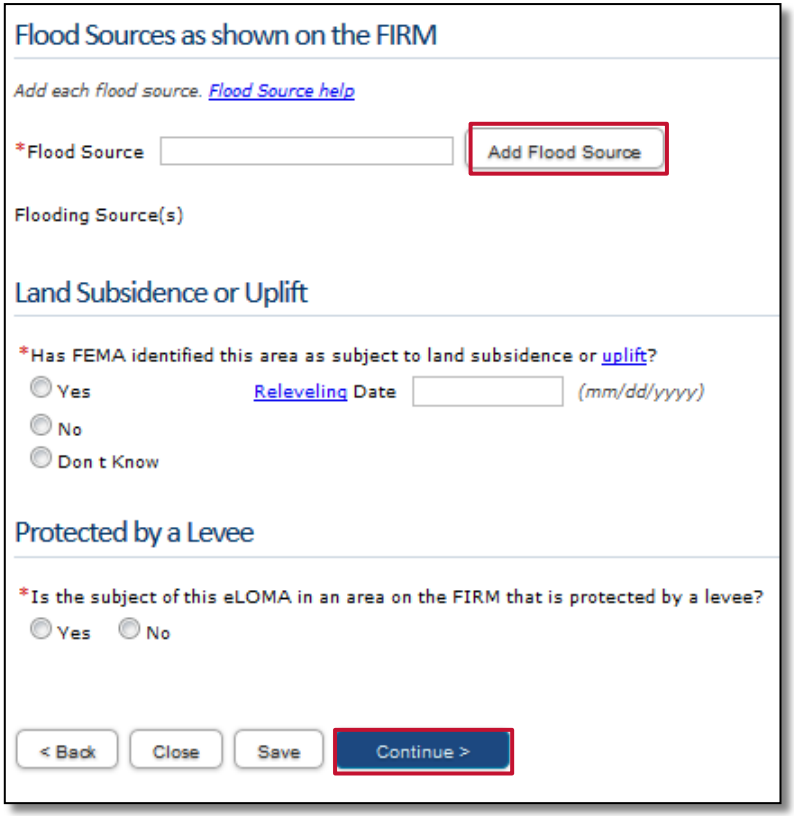
- BFE Method
  - Use the effective Flood Insurance Study (FIS) Profile or another FEMA Approved Method
    - For additional help on BFE method and calculation, select the hyperlink for additional guidance or contact the FMIX
  - Zone A BFE Source and Determination Method
    - If subject is located in a Zone A, you must identify the BFE Source and Determination method used to calculate the BFE



Application Steps

Step 6: Elevation Info

- Flood Sources as shown on the FIRM
  - Add all applicable flood sources and select **Add Flood Source**
  - Visit the Flood Source Help page for additional assistance
- Land Subsidence or Uplift
  - Identify if the area is subject to lowering of the ground as a result of land subsidence or uplift (i.e., water extraction, soil compaction, etc.)
  - If uncertain, contact the local Floodplain Administrator of the Subject's community for assistance
- Select **Continue**



Application Steps

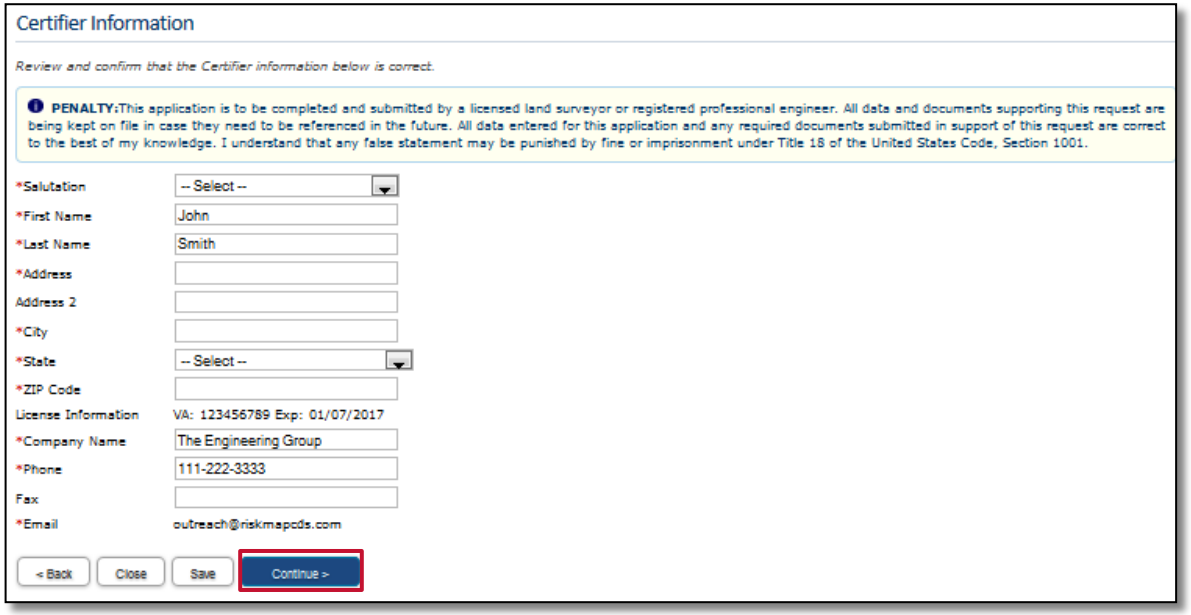
Step 7: Upload Files

- Depending on your selections in the application, will determine what documents you are required to upload
- **Required Document Types** are required to be uploaded and checked before proceeding
  - You may upload additional documentation in **Optional Documents Types**
- Upload all supporting documents in one complete or individual file(s)
- Select **Browse** to upload file(s) and add a description (optional)
- Select **Add Document**
  - The file will populate into the **Uploaded Documents Table**

Application Steps

Step 8: Certify

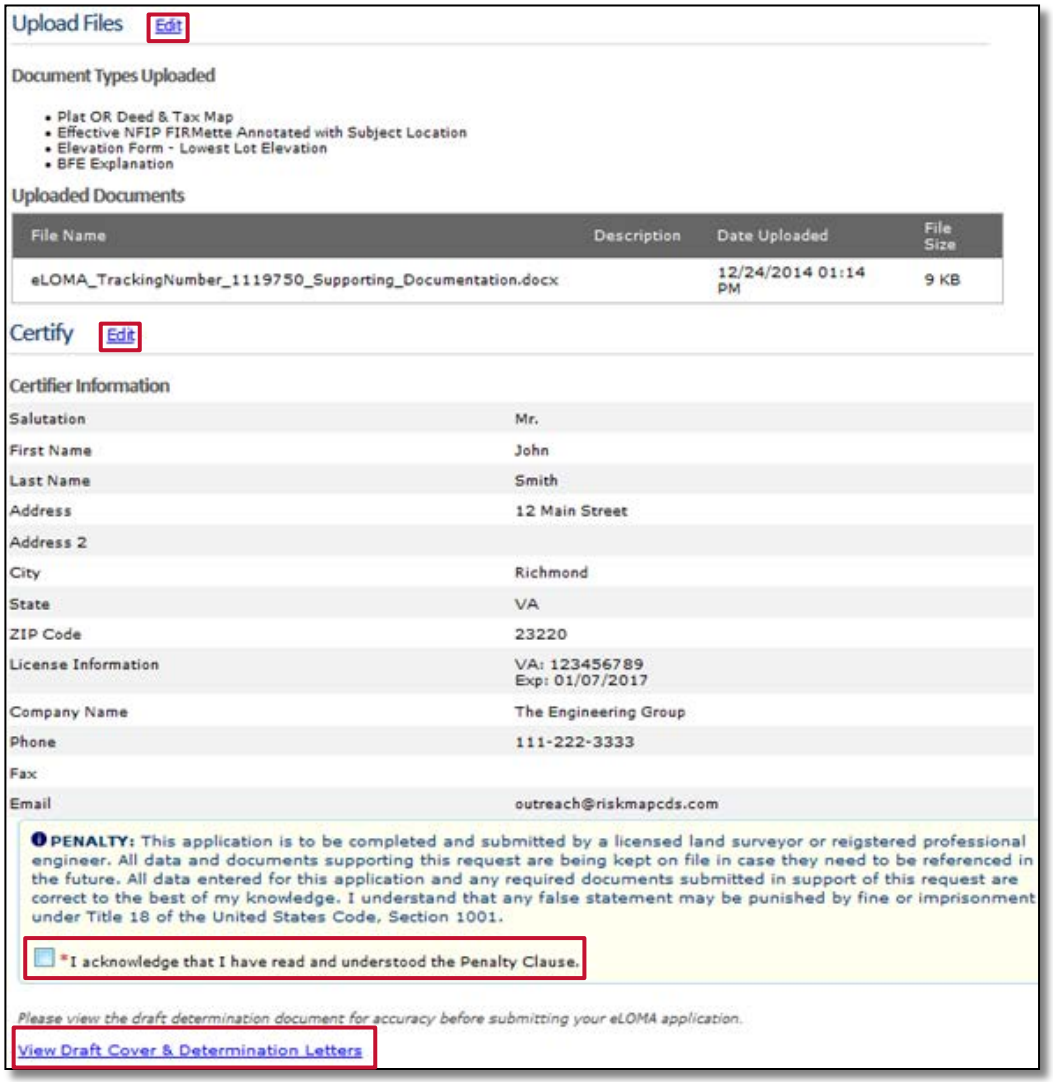
- **Confirm Elevation** by selecting the check box
- Review and confirm **Certifier Information** and **Penalty Clause**
  - Selected data fields will already be populated
  - License Information and Email cannot be modified
- Select **Continue**



Application Steps

Step 9: Review

- Review all application information and select **Edit** to modify information as needed
- Review & acknowledge **Penalty Clause** stating the information provided in the application is accurate
- Select **View Draft Cover & Determination Letters**



Upload Files Edit

Document Types Uploaded

- Plat OR Deed & Tax Map
- Effective NFIP FIRMette Annotated with Subject Location
- Elevation Form - Lowest Lot Elevation
- BFE Explanation

Uploaded Documents

File Name	Description	Date Uploaded	File Size
eLOMA_TrackingNumber_1119750_Supporting_Documentation.docx		12/24/2014 01:14 PM	9 KB

Certify Edit

Certifier Information

Salutation	Mr.
First Name	John
Last Name	Smith
Address	12 Main Street
Address 2	
City	Richmond
State	VA
ZIP Code	23220
License Information	VA: 123456789 Exp: 01/07/2017
Company Name	The Engineering Group
Phone	111-222-3333
Fax	
Email	outreach@riskmapcds.com

PENALTY: This application is to be completed and submitted by a licensed land surveyor or reigstered professional engineer. All data and documents supporting this request are being kept on file in case they need to be referenced in the future. All data entered for this application and any required documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punished by fine or imprisonment under Title 18 of the United States Code, Section 1001.

*I acknowledge that I have read and understood the Penalty Clause.

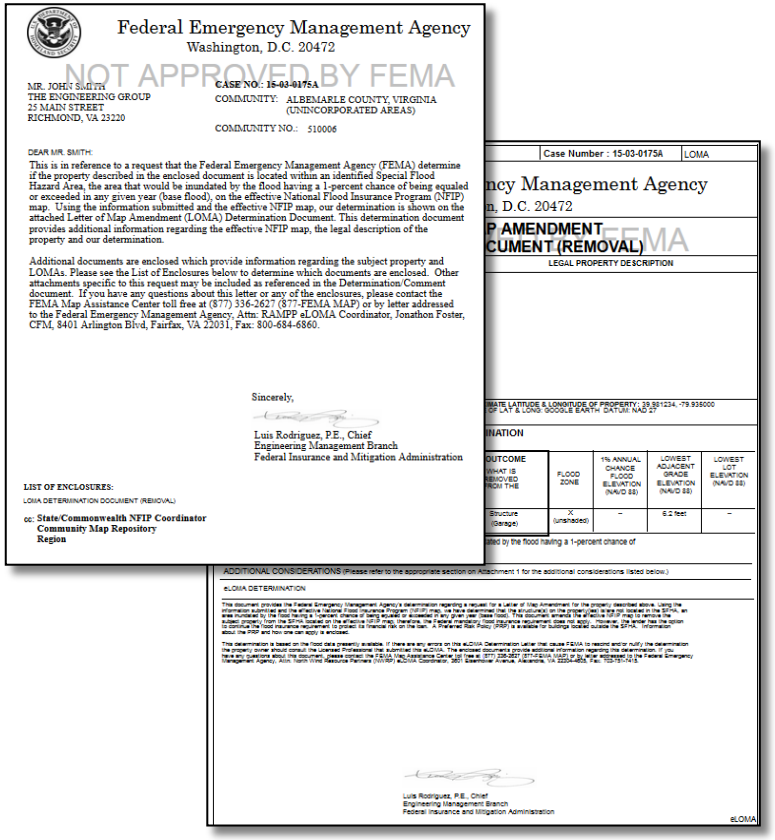
Please view the draft determination document for accuracy before submitting your eLOMA application.

View Draft Cover & Determination Letters

Application Steps

Step 9: Review

- Review the Draft Cover Letter & Determination Letter for accuracy
  - Document is a Draft copy and **not** the Final FEMA approved eLOMA Determination Letter
- Navigate through, email, or print the Draft Document by using the icons in the top menu
  - Help text describing each icon will populate when scrolling over the icon
- Once satisfied, return to the **Review** page of the eLOMA application and select **Submit**

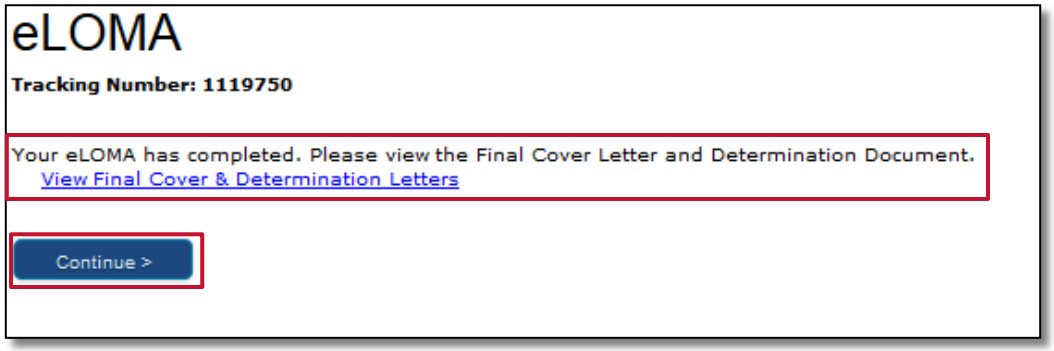

Federal Emergency Management Agency
Washington, D.C. 20472
NOT APPROVED BY FEMA
MR. JOHN SMITH
THE ENGINEERING GROUP
25 MAIN STREET
RICHMOND, VA 23220
CASE NO.: 15-03-0175A
COMMUNITY: ALBEMARLE COUNTY, VIRGINIA (UNINCORPORATED AREAS)
COMMUNITY NO.: 510006
DEAR MR. SMITH:
This is in reference to a request that the Federal Emergency Management Agency (FEMA) determine if the property described in the enclosed document is located within an identified Special Flood Hazard Area, the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), on the effective National Flood Insurance Program (NFIP) map. Using the information submitted and the effective NFIP map, our determination is shown on the attached Letter of Map Amendment (LOMA) Determination Document. This determination document provides additional information regarding the effective NFIP map, the legal description of the property and our determination.
Additional documents are enclosed which provide information regarding the subject property and LOMAs. Please see the List of Enclosures below to determine which documents are enclosed. Other attachments specific to this request may be included as referenced in the Determination/Comment document. If you have any questions about this letter or any of the enclosures, 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, Attn: RAMPP eLOMA Coordinator, Jonathon Foster, CFM, 8401 Arlington Blvd, Fairfax, VA 22031, Fax: 800-684-6860.
Sincerely,
Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration
LIST OF ENCLOSURES:
LOMA DETERMINATION DOCUMENT (REMOVAL)
cc: State/Commonwealth NFIP Coordinator
Community Map Repository
Region
Case Number : 15-03-0175A | LOMA
LEGAL PROPERTY DESCRIPTION
ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)
eLOMA DETERMINATION
eLOMA

Generate an eLOMA Determination Letter- Application Approved

Upon submitting the completed eLOMA application, two outcomes can occur:

1. Application is automatically approved without a FEMA audit

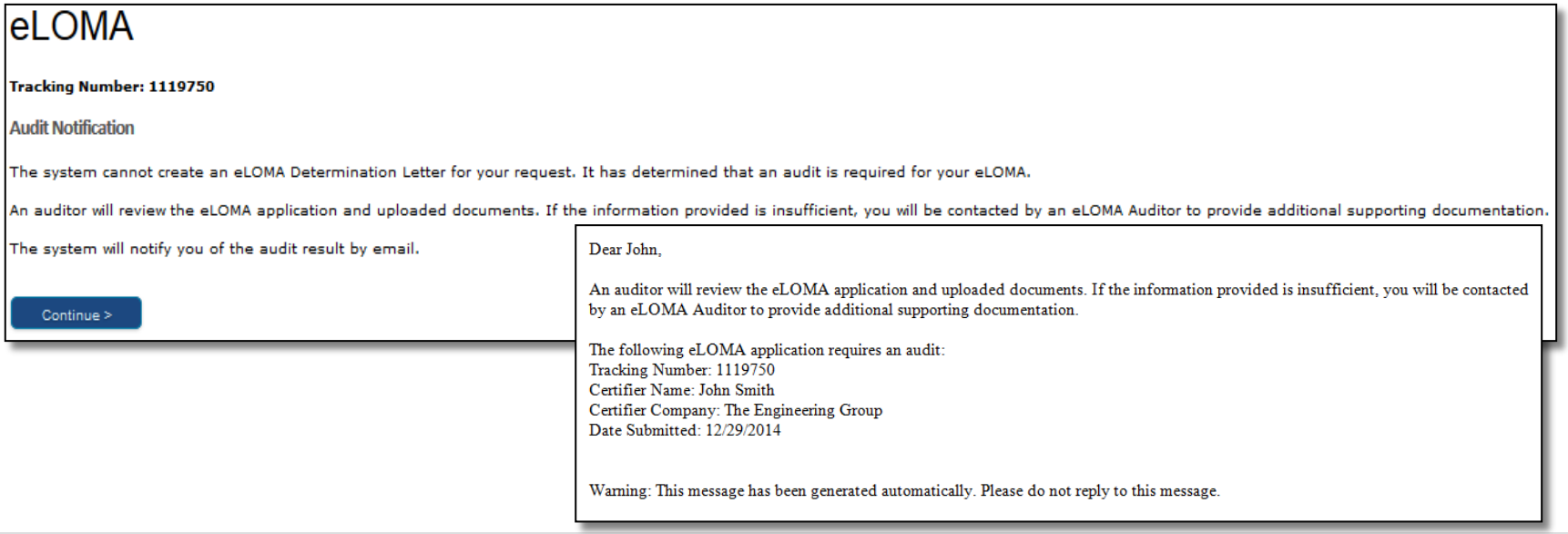
- Select the **Generate Final Determination** hyperlink action item
- Print or email the Final Determination PDF to interested parties
- Select **Continue**



Generate an eLOMA Determination Letter- Application Audited

2. Application is flagged for an audit

- You will receive an audit notification from the eLOMA system and an email stating a Final eLOMA Determination Letter cannot be created at that time and requires further review by an Auditor
- Once reviewed by an Auditor, another email may be sent to you requesting additional supporting documentation and to upload within the eLOMA tool



Audit In Progress

- Applications flagged for an audit, will have an **Audit in Progress** status on the your Work Item List
  - You may still **View/Print** the Draft Determination Draft Cover Letter & Determination Letter PDF
  - No Action will display at this time

Tracking Number	Case Number	Status	Determination Outcomes	State	County	Community	View/Print	Action
1119755	15-03-0059A	Audit in Progress		VA	Virginia Beach City	VIRGINIA BEACH, CITY OF		

Audit In Progress: Requesting Additional Supporting Documentation

- You will receive an email requesting additional supporting documentation
  - Once logged into the tool, you will see an action to **Submit Requested Documents** with the application Case Number and an updated Audit Status, **Pending Action – Audit Approved**
  - Select the hyperlink to view and upload requested documents
  - Requested documents may only be uploaded into the tool and not by responding to received email notifications

Dear John,

An Auditor has requested Supporting Documentation for your eLOMA application 15-03-0054A.

To view what documentation has been requested and to perform these uploads:

1.Log into the eLOMA tool from the MIP
2.In your Work Item List, click the 'Requested' link (in the "Action" column) for the specified eLOMA Application

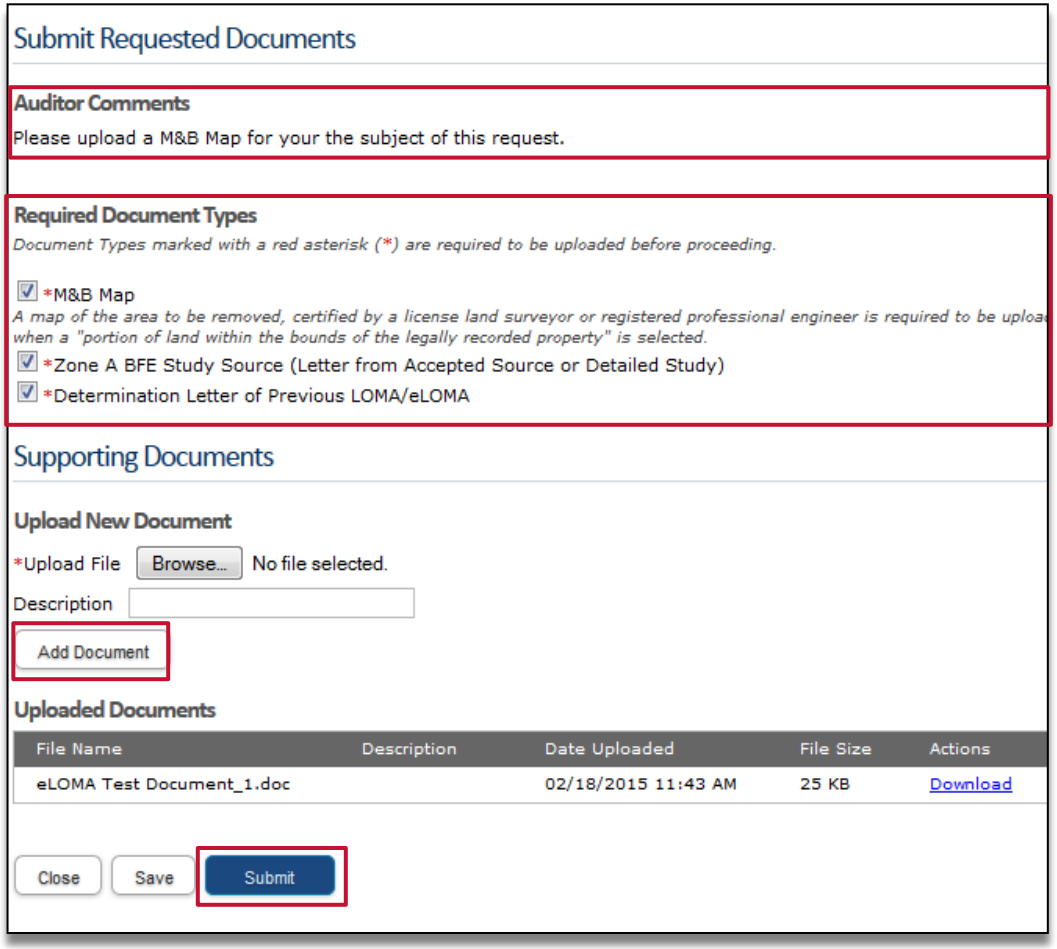
If you face an issues related viewing the uploaded information, please contact the MIP Help Desk at miphelp@riskmapcds.com.

This message has been generated

Tracking Number	Case Number	Status	Determination Outcomes	State	County	Community	View/Print	Action
1119776	15-03-0075A	Pending Action - Audit Approved		VA	Falls Church City	FALLS CHURCH, CITY OF		Submit Requested Documents for 15-03-0075A

Audit In Progress: Requesting Additional Supporting Documentation

- Hyperlink will open to the **Upload Files** page
- **Auditor Comments** will display on top of page
- Select all **Required Document Types** the Auditor requested
- Upload additional **Supporting Documents** and **Add Document**
  - Previously uploaded files cannot be deleted
- Select **Submit**



Audit In Progress: Requesting Additional Supporting Documentation

- You will receive a confirmation email for submitting the requested documents
- If additional supporting documents are needed, you will be notified via email

Dear John,

An auditor will review the eLOMA application and uploaded documents. If the information provided is insufficient, you will be contacted by an eLOMA Auditor to provide additional supporting documentation.

The following eLOMA application requires an audit:
Tracking Number: 1119744
Certifier Name: John Smith
Certifier Company: The Engineering Group
Date Submitted: 01/19/2015

Warning: This message has been generated automatically. Please do not reply to this message.

Audit Complete

- If approved, you will receive an email stating the audit is complete and the Final Determination can be retrieved within the eLOMA tool, along with comments from the Auditor

Dear John,

Your eLOMA application has passed its audit. You may resume the application and generate a Letter of Determination.

Tracking Number: 1119865
Certifier Name: John Smith
Certifier Company: The Engineering Group
Certifier User Name: John Smith
Date Submitted: 02/18/2015

Approval Comments: Please include a copy of the M&B map for requests that contain a portion of land within the bounds of legally recorded property.

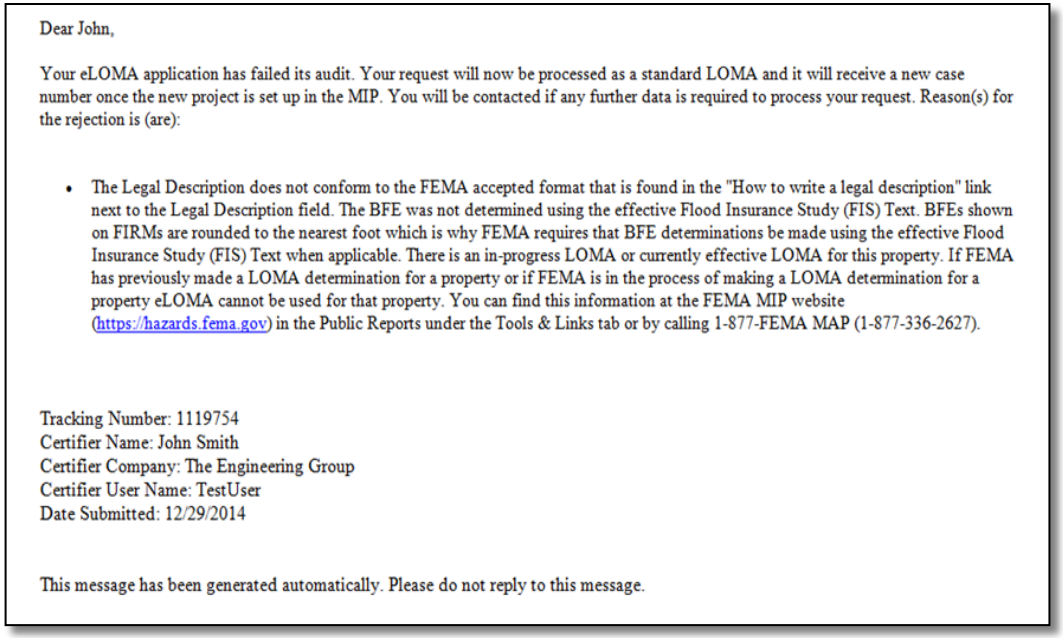
This message has been generated automatically. Please do not reply to this message.

- Once logged in the tool, select **Generate Final Determination**

Tracking Number	Case Number	Status	Determination Outcomes	State	County	Community	View/Print	Action
1119755	15-03-0059A	Pending Action - Audit Approved		VA	Virginia Beach City	VIRGINIA BEACH, CITY OF		Generate Final Determination for 15-03-0059A

Audit Rejected

- You will receive an email stating the audit failed and rejection reason(s)
- You will not have to re-submit their application package, the request will be processed as a standard LOMA and will receive a new case number
  - A FEMA LOMA representative will be in contact if additional information is needed to process the request



Dear John,

Your eLOMA application has failed its audit. Your request will now be processed as a standard LOMA and it will receive a new case number once the new project is set up in the MIP. You will be contacted if any further data is required to process your request. Reason(s) for the rejection is (are):

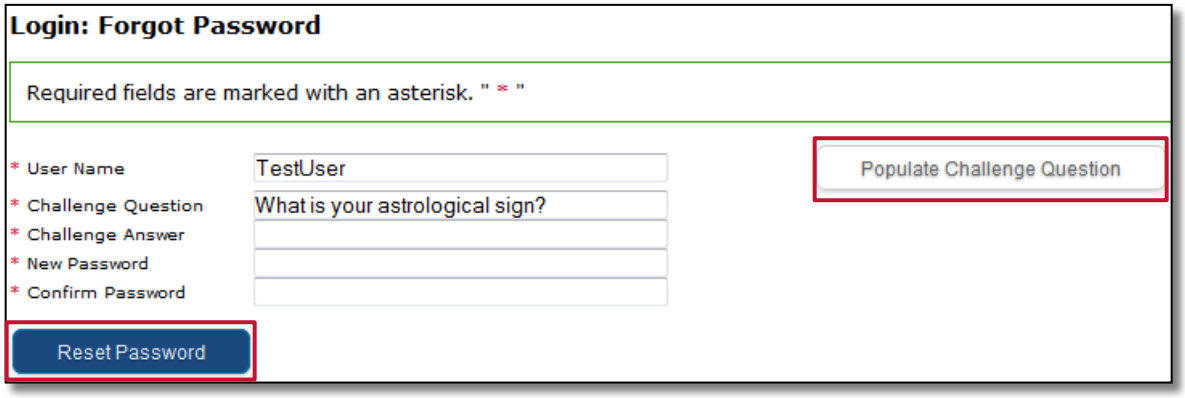
- The Legal Description does not conform to the FEMA accepted format that is found in the "How to write a legal description" link next to the Legal Description field. The BFE was not determined using the effective Flood Insurance Study (FIS) Text. BFEs shown on FIRMs are rounded to the nearest foot which is why FEMA requires that BFE determinations be made using the effective Flood Insurance Study (FIS) Text when applicable. There is an in-progress LOMA or currently effective LOMA for this property. If FEMA has previously made a LOMA determination for a property or if FEMA is in the process of making a LOMA determination for a property eLOMA cannot be used for that property. You can find this information at the FEMA MIP website (https://hazards.fema.gov) in the Public Reports under the Tools & Links tab or by calling 1-877-FEMA MAP (1-877-336-2627).

Tracking Number: 1119754
Certifier Name: John Smith
Certifier Company: The Engineering Group
Certifier User Name: TestUser
Date Submitted: 12/29/2014

This message has been generated automatically. Please do not reply to this message.

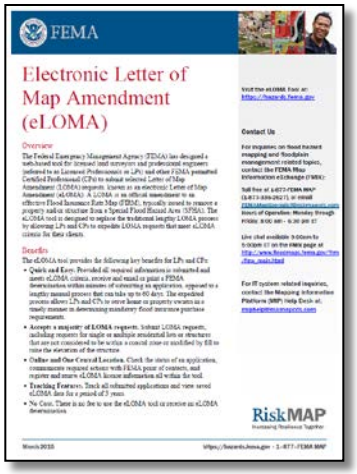
Reset Password

- Navigate to the **Log In** page and select **Forgot Password**
- Enter in **User Name** and select **Populate Challenge Question** and enter in **Challenge Answer**
- Enter in **New Password** and confirm
- Select **Reset Password**
- You will receive an email confirmation of reset password



Additional Resources and Help Desk Information

- For more information on eLOMA, visit the following user resources:
  - Frequently Asked Questions (FAQ) Page
  - Webpage
  - Factsheet on the FEMA Library
- For Help Desk support, contact:
  - A FEMA Map Information eXchange (FMIX) Map Specialist for flood hazard mapping/floodplain management related inquiries, including understanding Elevation Certificates and BFE calculations
    - Call (1-877) FEMA MAP (1-877-336-2627) Monday-Friday, 8:00am- 6:30pm (EST)
    - Email FEMAMapSpecialist@riskmapcds.com
    - Chat with a Map Specialist Monday-Friday, 9:00am- 5:00pm (EST)
  - The MIP Help Desk at miphelp@riskmapcds.com for system related inquiries, including help logging into the eLOMA tool


FEMA

Electronic Letter of Map Amendment (eLOMA)

RiskMAP

FEMA

FEMA

Online Letter of Map Change (LOMC)Tutorial-Amendments

November 2018

RiskMAP

Increasing Resilience Together

Welcome to the Online LOMC Tutorial for Amendments

What's in this Tutorial

In this tutorial you will find:

- Information about LOMCs and what you may need to apply for one
- A step-by-step guide through the online application process to complete an Amendment request
- Customer service contact information and where you can get additional help

If you want to know more about submitting a Revision request, see: fema.gov/online-lomc

Background: Flood Maps

- Flood maps, or Flood Insurance Rate Maps (FIRMs), are community maps that display high-risk floodplains, specifically:
  - Special Flood Hazard Areas (SFHAs)
  - Risk premium zones
- FEMA determines flood zones in consultation with communities, states, and other stakeholders
- SFHAs are land areas at high risk for flooding
  - A home located within a SFHA has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage
- FIRMs show flood risk zones and their boundaries, and may also show floodways and Base Flood Elevations (BFEs)

Background: What Is a LOMC?

What is a LOMC?

- A LOMC is a letter that reflects an official Amendment or Revision to an effective FIRM
- To get a property removed from a SFHA, FEMA must issue a LOMC

Background: Why a LOMC?

Why would you want a LOMC?

- Property owners or lessees within SFHAs who have mortgages from a federally backed mortgage lender are required to purchase flood insurance
- If a LOMC is granted, property owners or lessees may be eligible for lower flood insurance premiums, or the option to not purchase flood insurance

Introducing Online LOMC

- Use Online LOMC to request Amendments or Revisions
- Online LOMC may be used to request LOMCs in place of the MT-EZ , MT-1 or MT-2 paper forms
- Online LOMC does not shorten FEMA's time to make a determination
  - Determinations will be made within 60 days of a completed Amendments request and 90 days of a Revisions request
  - Requests are considered 'complete' after FEMA has received all requested data and payment has been approved

Introducing Online LOMC

- Anyone can use the Online LOMC!
  - Home or property owners, or lessees
  - Professional Surveyors
  - Professional Engineers
  - Other representatives of the property owner or lessee

Access Online LOMC: www.fema.gov/online-lomc, www.hazards.fema.gov, or www.hazards.fema.gov/femaportal/onlinelomc/signin

Benefits of Submitting a LOMC Online

Why is Online LOMC better than filing by mail?

- Submit, pay, and upload supporting documentation for all LOMC requests through one single online platform
- Save information online and finish applying at your convenience
- Easily apply with the clear and intuitive
- Manage multiple LOMC requests with one login
- Check their application status in real-time
- Efficiently communicate with LOMC processing staff

Which one is right for me, a map Amendment or Revision?

There are two basic categories of LOMCs: Amendments and Revisions

Submit an Amendment request if:	Submit a Revision request if:
• You are applying for a LOMA, CLOMA, LOMR-F, or CLOMR-F • You would have completed the MT-EZ or MT-1 paper forms if submitting by mail • Your request pertains to a small area of high ground (a property or structure) located within a SFHA or the placement of fill on a property • You are a homeowner or lessee, developer, or community official, or acting on behalf of one	• You are applying for a LOMR or CLOMR • You would have completed the MT-2 paper form if submitting by mail • You are requesting revisions to effective FIS reports or FIRMs

Types of Amendments

Use the Online LOMC to submit an Amendment (MT-EZ, MT-1)

Types of LOMAs	Description
Letter of Map Amendment (LOMA)	Typically, a LOMA is issued when the scale of the FIRM does not allow for small areas of natural high ground to be shown outside the SFHA
Conditional Letter of Map Amendment (CLOMA)	A letter from FEMA stating a proposed structure that is not to be elevated by fill (natural grade) would not be inundated by the base flood if built as proposed
Letter of Map Revision based on Fill (LOMR-F)	A LOMR-F is similar to a LOMA, but instead of being based on natural ground elevations, the property or structure has been elevated by fill in order to elevate it above the flood elevation
Conditional Letter of Map Revision based on Fill (CLOMR-F)	A letter from FEMA stating a parcel of land or proposed structure that will be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed

To access the training presentation demonstrating how to submit an Online LOMC Revision (LOMR, CLOMR) see www.fema.gov/online-lomc

What else do you need?

Additional forms may be required to complete an Amendment Application

Additional requirements	Where you can find it
Elevation Form or Existing Elevation Certificate*	Within Online LOMC application or on fema.gov
FIRM Panel or FIRMette	MSC store: msc.fema.gov
(A) Subdivision Plat Map or (B) Property Deed with Tax Assessor's map or other suitable map	County/Parish Clerk, Recorder, or Registrar of Deeds for your Community

*If an NFIP Elevation Certificate has already been completed for the property, it may be submitted in lieu of the Elevation Form. Check with your community to see if an Elevation Certificate is already on file for your property or structure.

Scan, upload, and submit these forms via Online LOMC

What else do you need (cont'd)?

Additional forms may be required to complete an Amendment Application

Additional requirements	Where you can find it
ESA Compliance Documentation**	"FEMA requires documentation of ESA compliance for a proposed project before it will process Conditional Letters of Map Revision (CLOMRs) or Conditional Letters of Map Revision based on Fill (CLOMR-Fs), but it is not FEMA's role to assist with accomplishing ESA compliance for private actions or non-FEMA federal actions. If federal construction, funding or permitting is involved in a project for which a CLOMR or CLOMR-F is being requested, then the applicant may use that agency's Section 7 consultation to document to FEMA that ESA compliance has been achieved. The documentation may be: 1. A "No Effect" determination made by, or concurred by, the federal agency. 2. A "Not Likely to Adversely Affect" determination with concurrence from the Services. 3. A biological opinion with a "no jeopardy" determination or with accepted reasonable and prudent alternatives. 4. A copy of a federally issued permit with justification that the proposed development for which a CLOMR or CLOMR-F is sought is covered by the permit. While FEMA does not play a role in ESA compliance for proposed private development, these projects are required to comply with the ESA independently of FEMA's process. For these projects, the requester must document that: 1. No potential for "Take" exists (meaning that the project has no potential to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) to threatened and endangered species. The requester will be responsible for the potential for take determination and the determination is not required to come from, or be concurred by, the Services. 2. If the requester determined a "Take" will or has a potential to occur, they can consider contacting the Services to discuss potential project revisions to eliminate the "Take." 3. If neither 1 or 2 are possible and the project has the potential to "Take" listed species, an Incidental Take Permit may be submitted showing that the project is the subject or is covered by the subject of the permit."

**The purpose of the ESA is to conserve threatened and endangered species and the ecosystems upon which they depend. Go to the Compliance with Endangered Species Act for Letters of Map Change to receive more guidance on how to obtain this documentation.

eLOMA vs. Online LOMC

eLOMA is web-based application that provides licensed land surveyors and professional engineers with a system to submit simple LOMA requests to FEMA

- Only for a sub-set of LOMA requests
- Generates a determination from FEMA in minutes
- Must be a Licensed Professional to use
- For more information on eLOMA, visit this FAQ

What's the difference?

- Only licensed surveyors and engineers can submit a LOMA request through eLOMA, but anyone can use Online LOMC
- eLOMA only accepts the most basic LOMA requests and the determination is made automatically with standard checks, instead of lengthier manual review

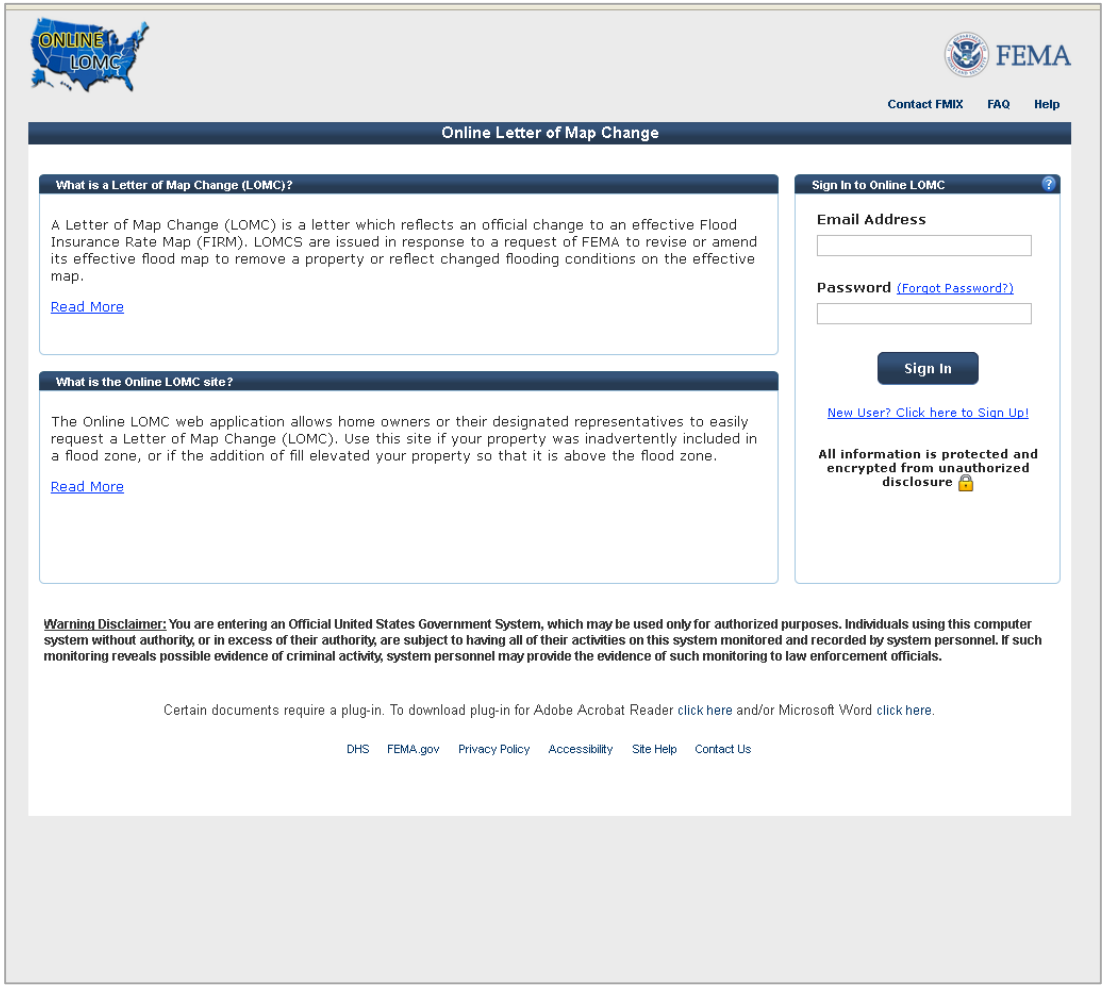
Online LOMC Walk-Through for Amendments

The following screens show the step-by-step process of submitting a LOMC through the Online LOMC

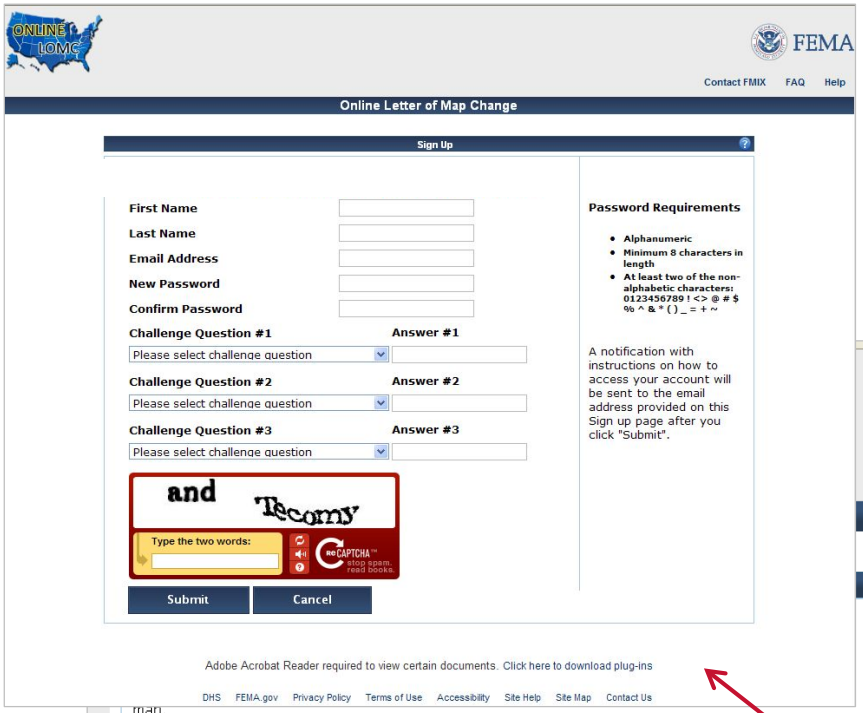
Log-in Page

- Key Features: FAQ, Help, Contact FMIX
- By clicking 'Contact FMIX,' the FMIX website opens in a separate window:

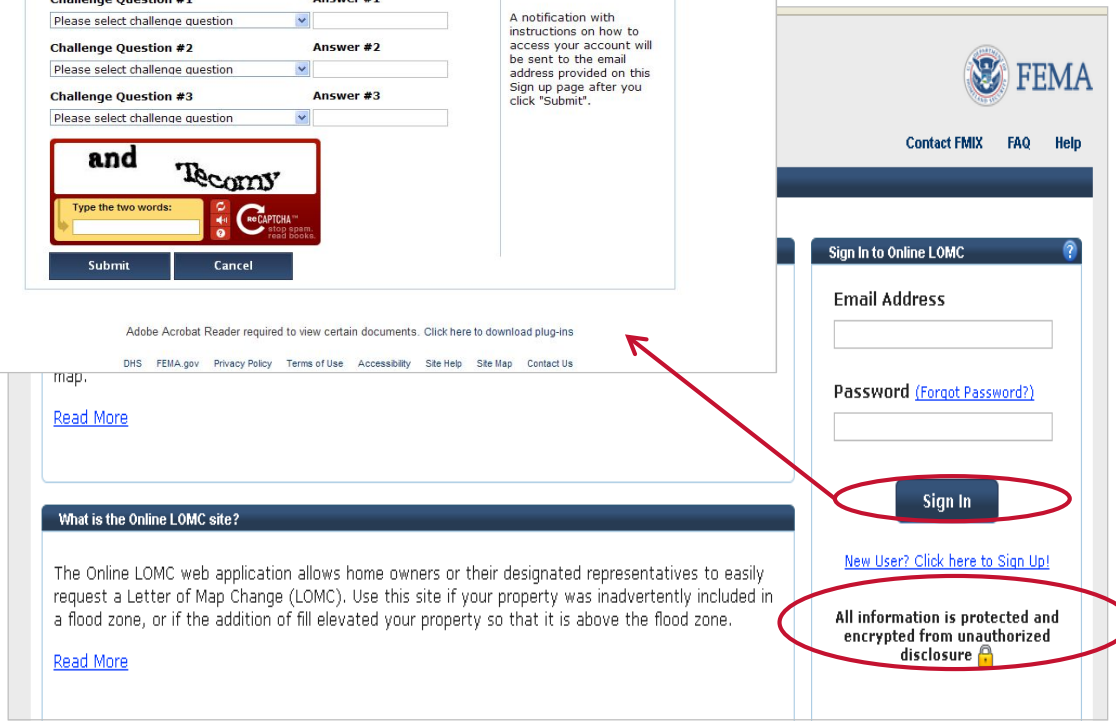
  https://www.floodmaps.fema.gov/fhm/fmx_main.html



New User Registration

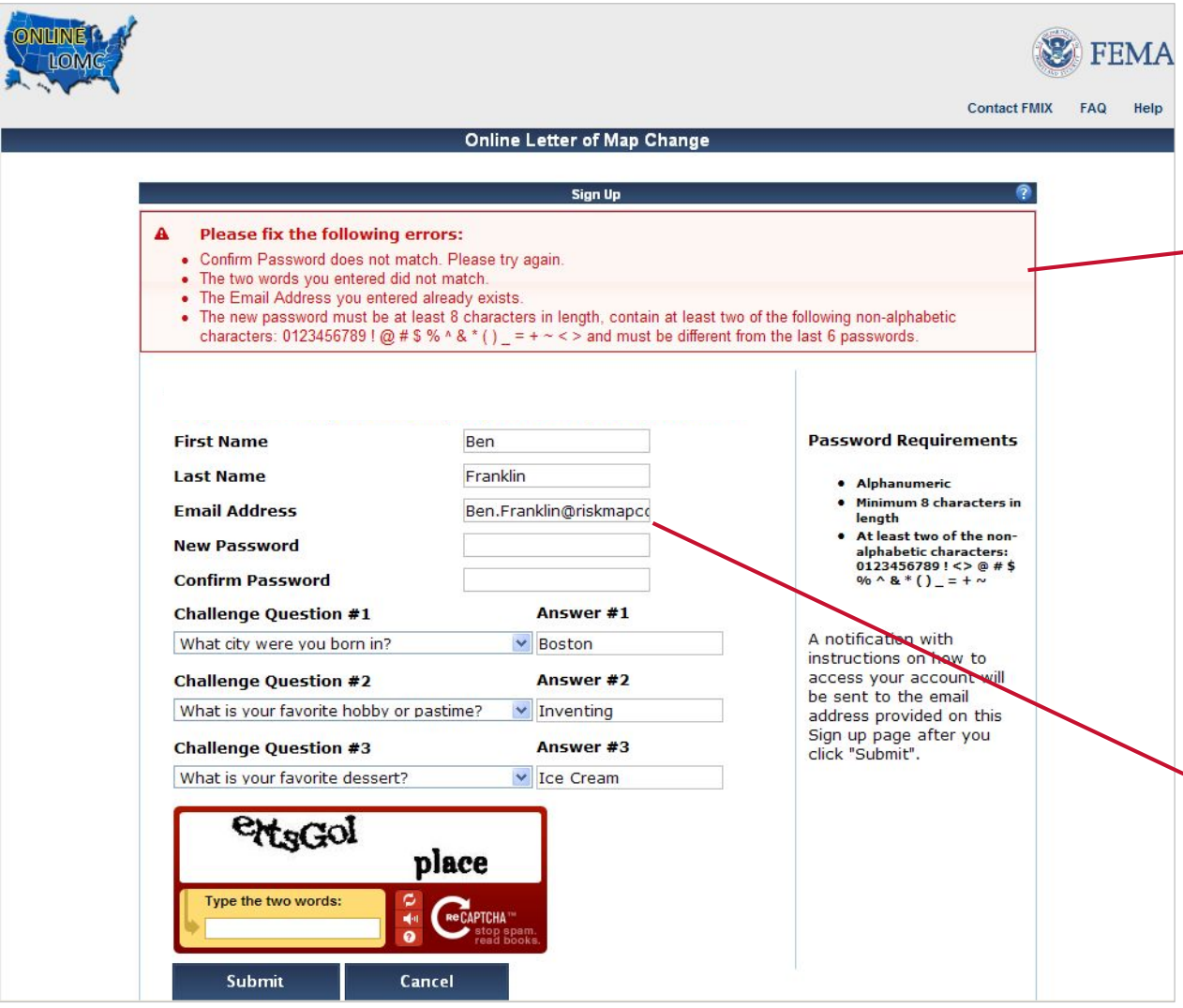


New users must register before starting the LOMC application



All information is encrypted and protected

New User Registration

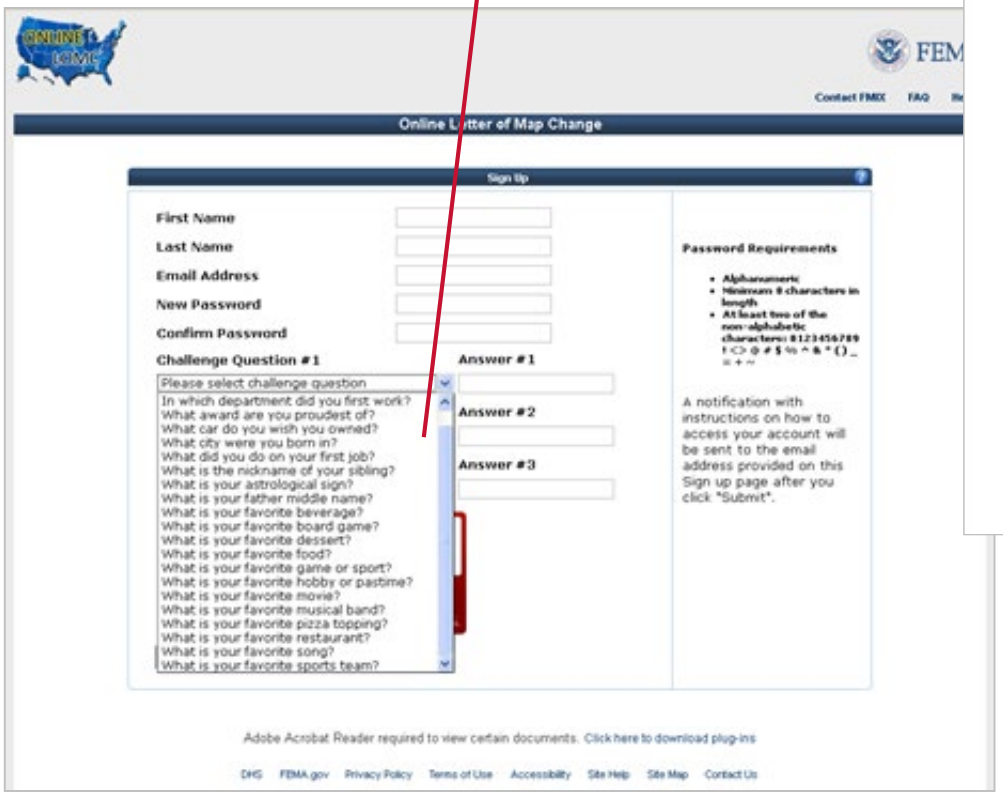


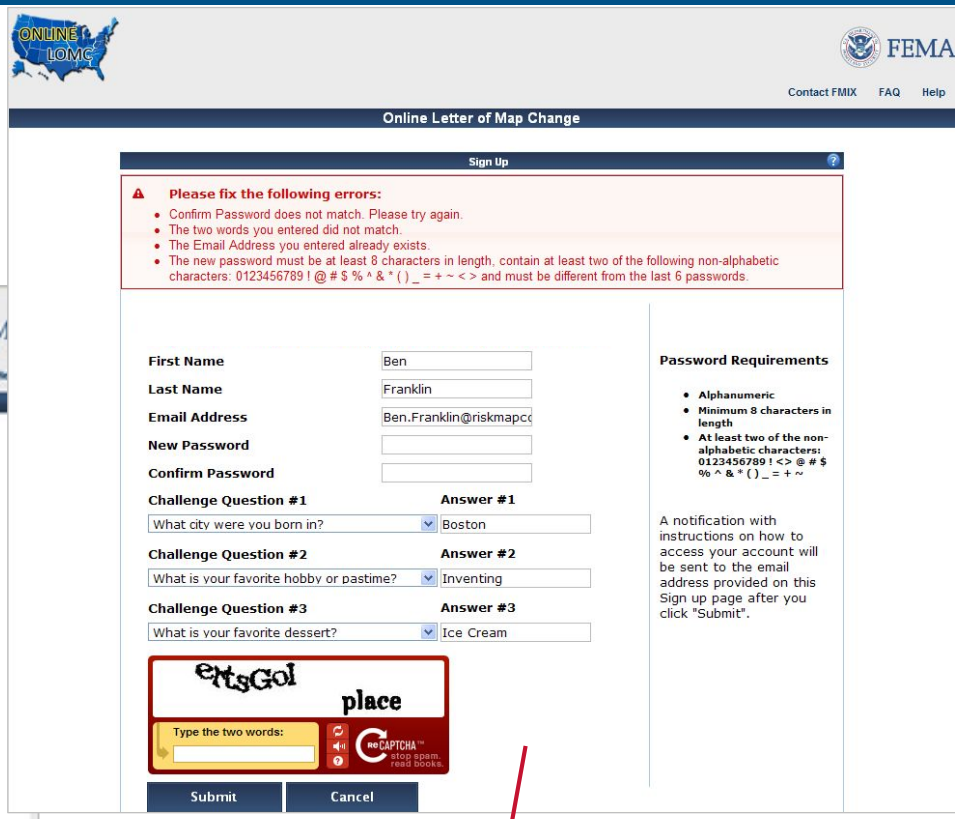
An error message will display if there is missing or improper information

The email address entered here will be used for all official communication (i.e. a request for more information, notification of a determination on your application)

New User Registration

Choose three security questions





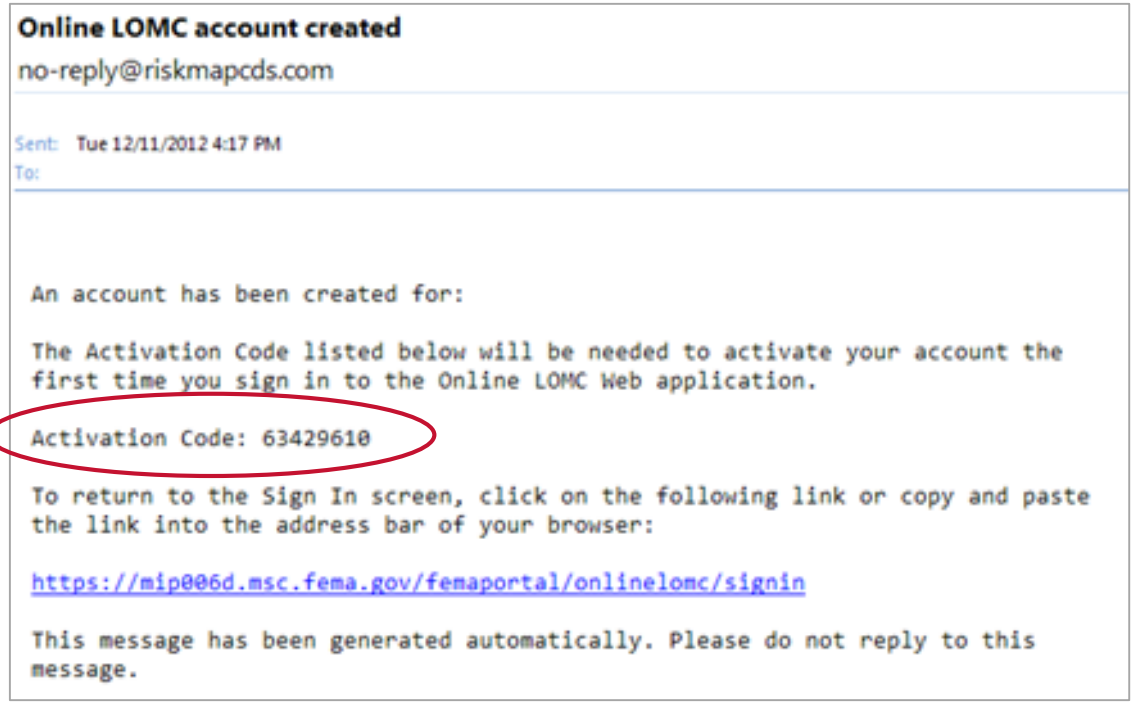
Enter the letters or symbols for account validation – punctuation and capitalization matter

Activation Code

After you create an account, the system will send you an email with an access code

Retrieve the Activation Code

- Check the email address you used when creating your account
- Email will contain a subject 'Online LOMC account created'
- From no-reply@riskmapcds.com



Online LOMC account created

no-reply@riskmapcds.com

Sent: Tue 12/11/2012 4:17 PM

To:

An account has been created for:

The Activation Code listed below will be needed to activate your account the first time you sign in to the Online LOMC Web application.

Activation Code: 63429610

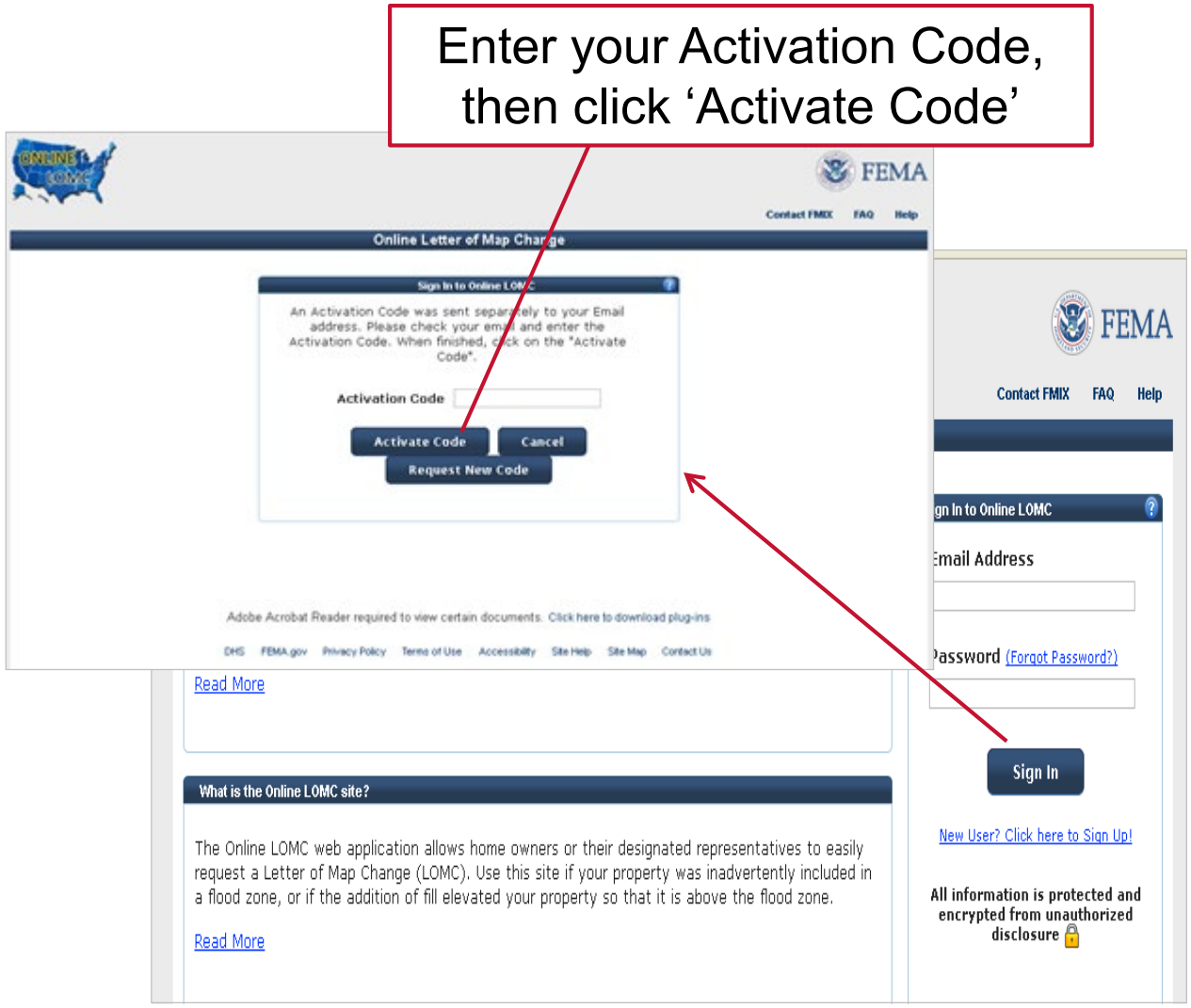
To return to the Sign In screen, click on the following link or copy and paste the link into the address bar of your browser:

https://mip006d.msc.fema.gov/femaportal/onlinelomc/signin

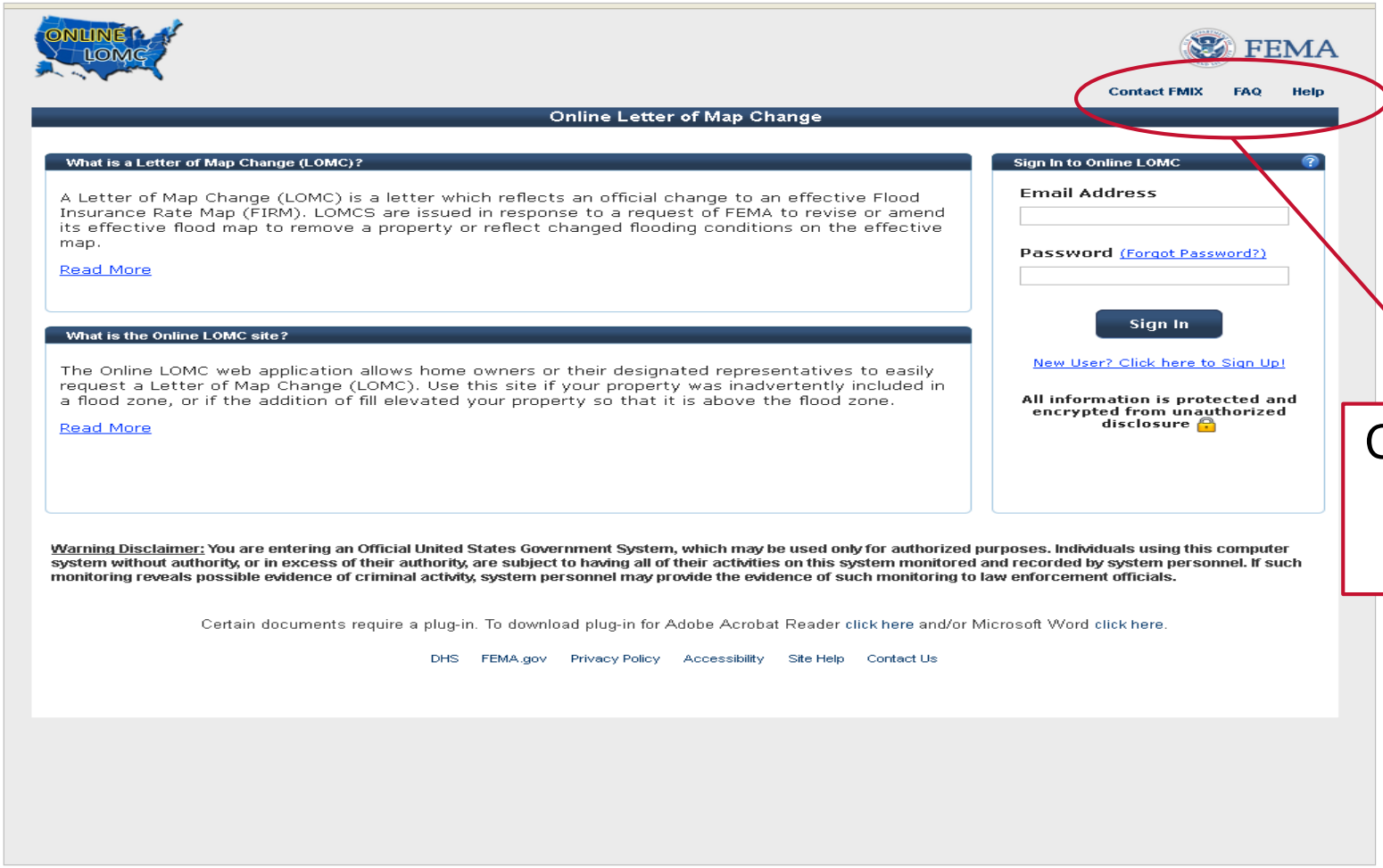
This message has been generated automatically. Please do not reply to this message.

Enter the Activation Code

- Return to the Log-in screen, enter your email address and password
- The first time you log in, the system will prompt you to enter the activation code
- If you cannot find the activation code, you may request a new code



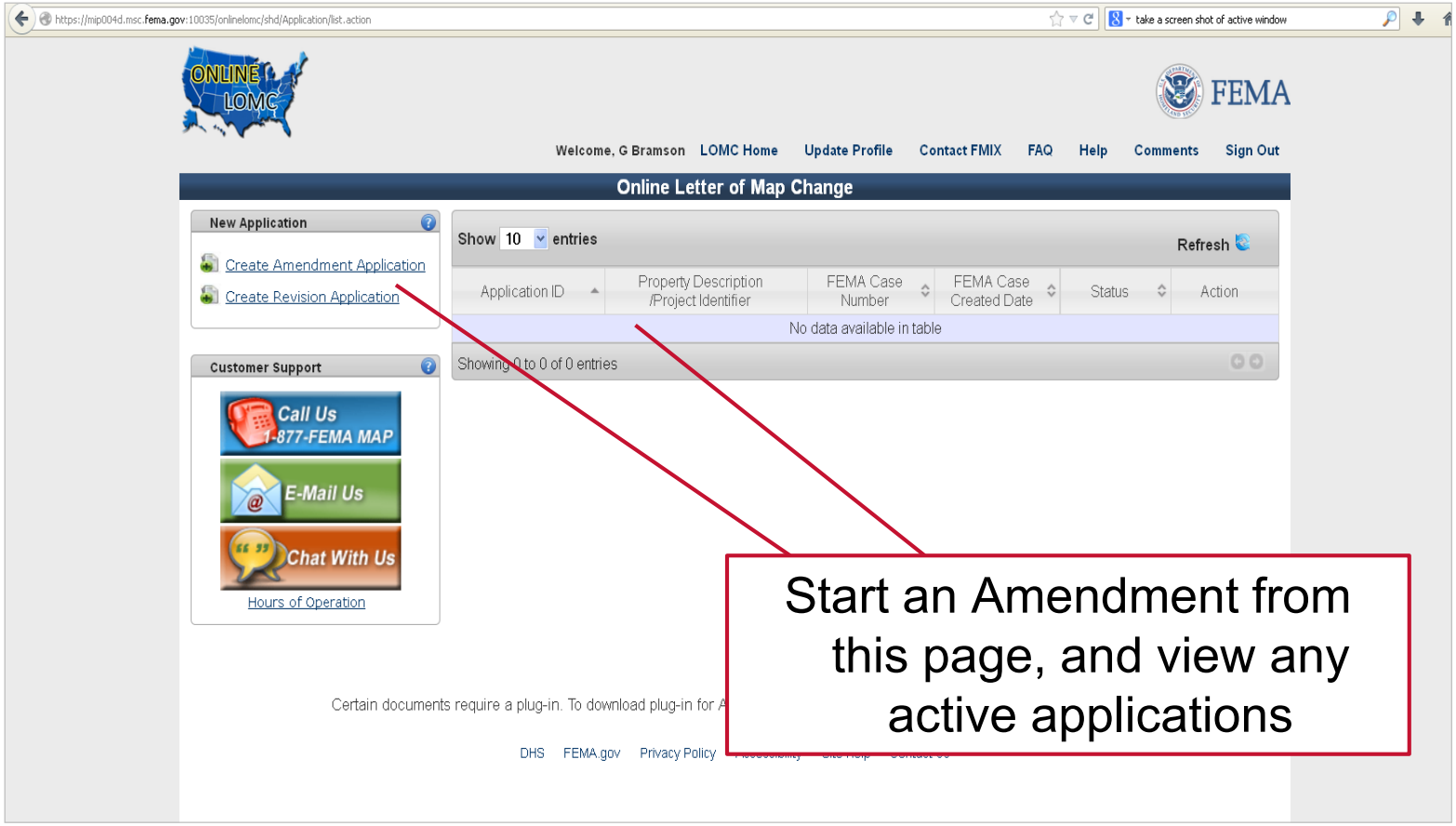
Customer Support



Customer Support Options

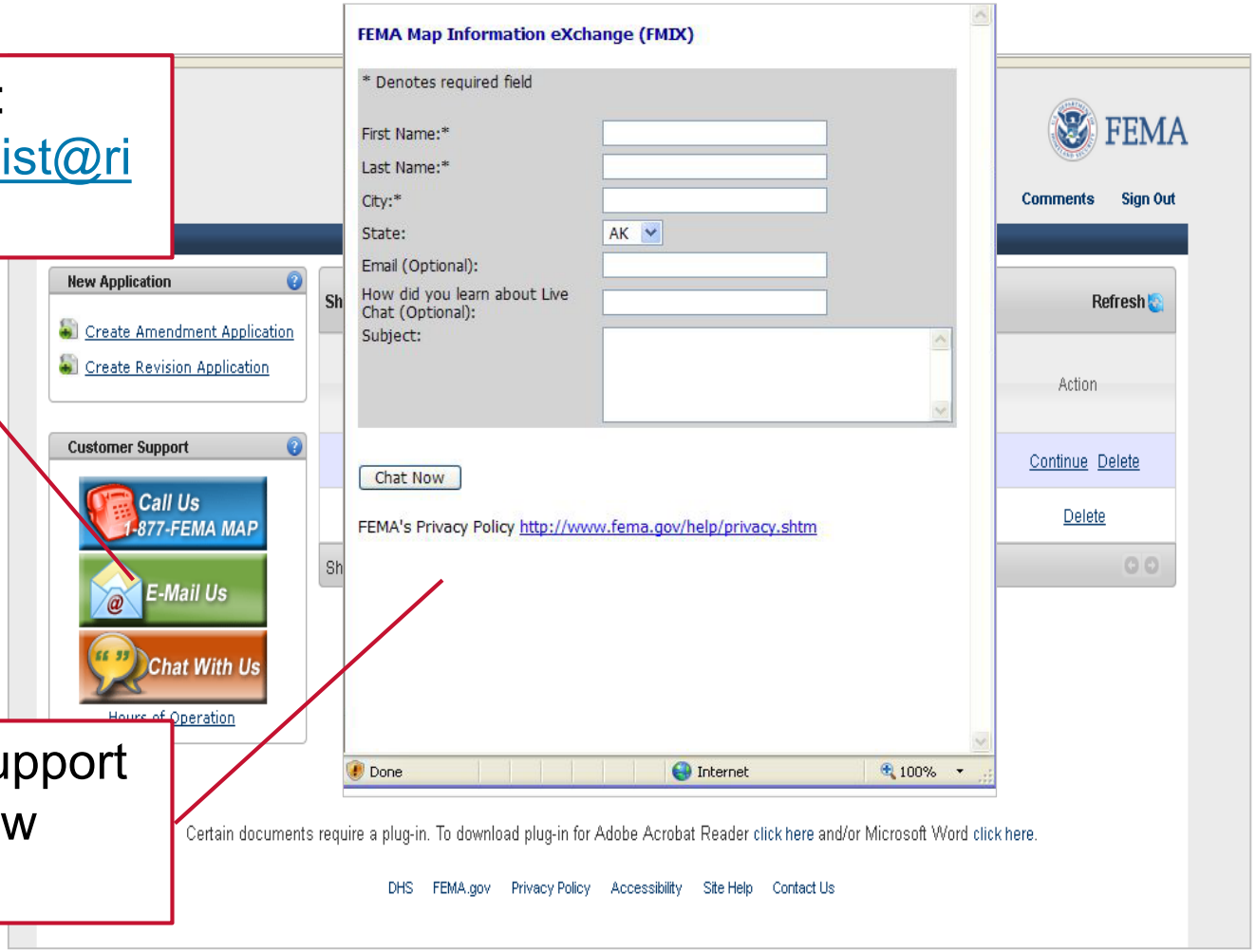
Application Status Page

Main page after log-in



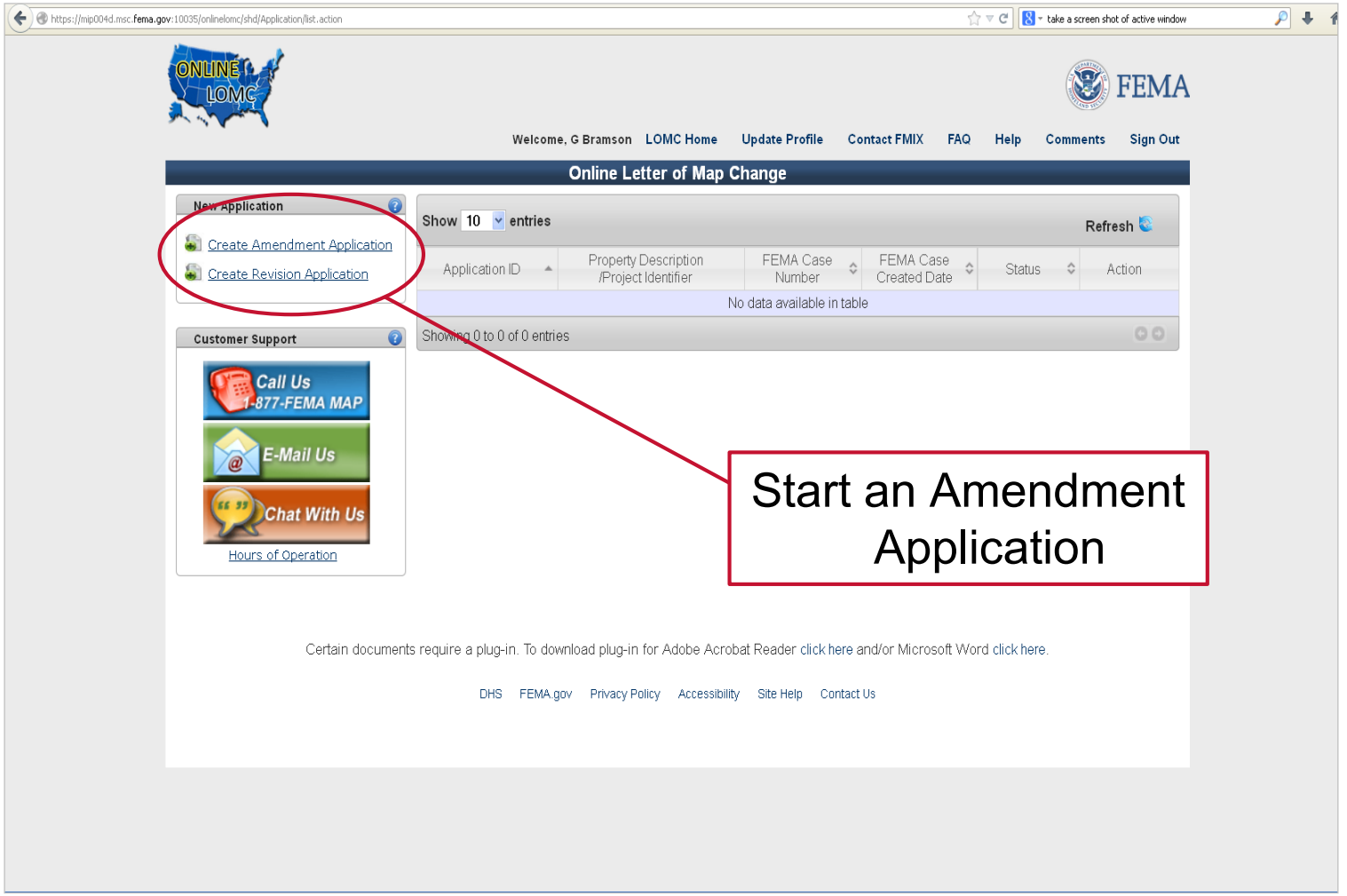
Application Status Page: Customer Support

‘E-mail Us’ button: FEMAMapSpecialist@riskmapcds.com



FMIX Live Chat support will pop up in a new window

Start a New Application



Incomplete Requests

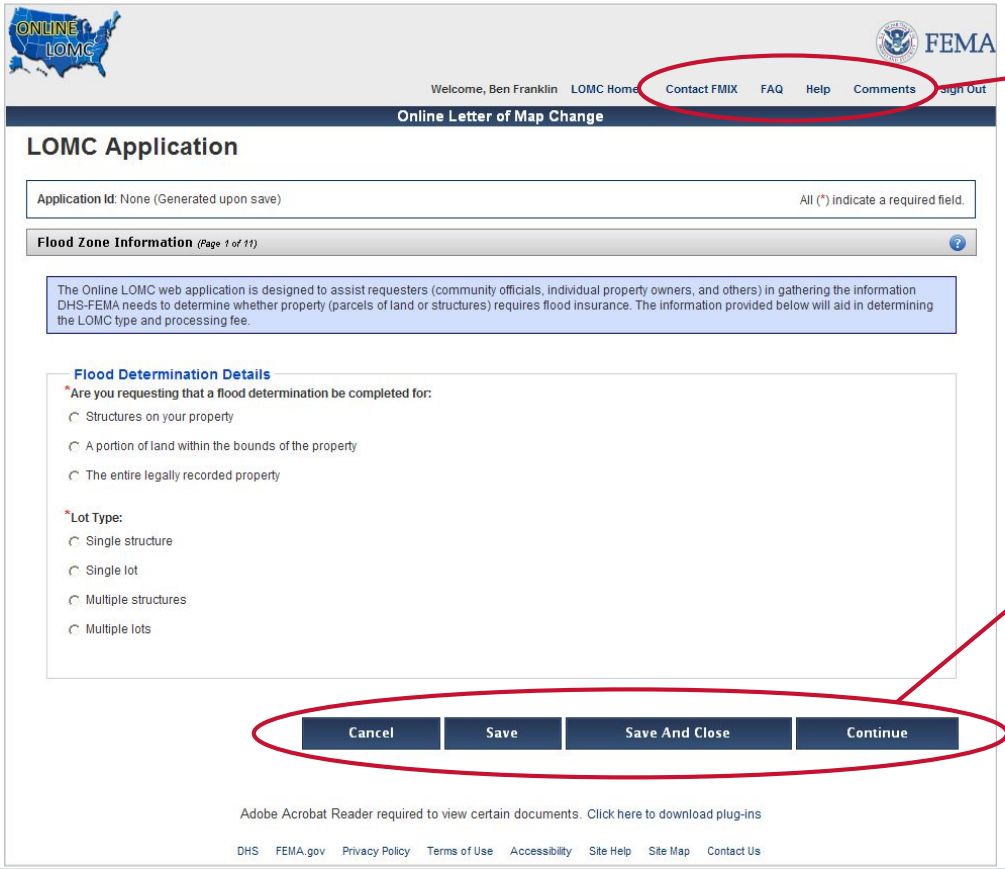
- You must log into Online LOMC every month, open any incomplete LOMC requests, and save any incomplete LOMC requests to keep them active
- If you have not logged in and re-saved un-submitted LOMC applications for 30 days, Online LOMC will send you an email notice that your un-submitted application will be deleted in 14 days
- This does not apply to submitted applications

Time-out

- If you leave the Online LOMC screen for 25 minutes, a pop-up window will appear with a 5-minute warning that your session will time-out
- If you click on the warning before the 5 minutes are up, your session will be extended
- When time-out occurs, you will be logged out
- When your session times-out and you have not saved, you may lose unsaved information
- Time-out occurs after leaving Online LOMC idle for 30 minutes

Flood Zone Information

An Application ID is generated after your first save, or when you first click ‘Continue’

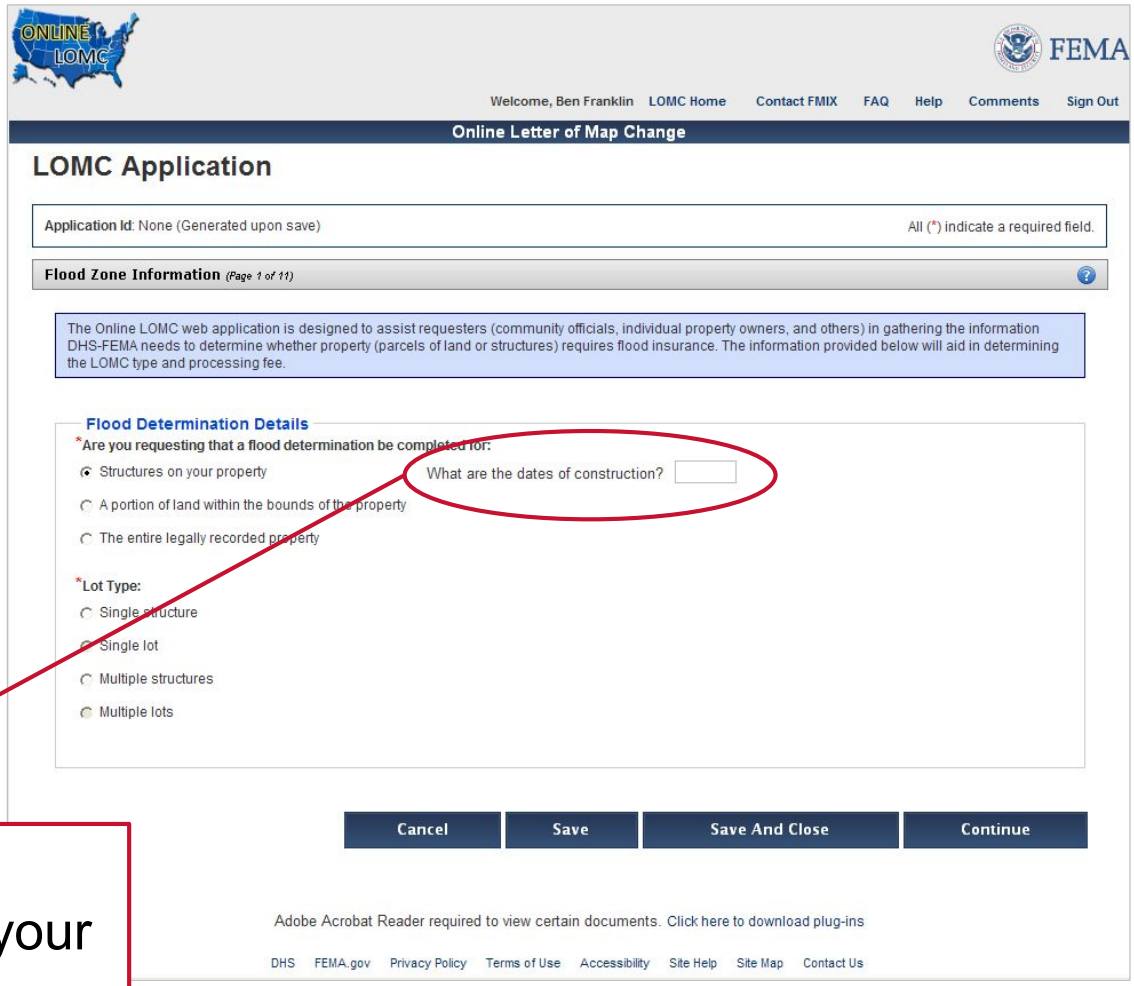


‘Contact FMIX’, ‘FAQ’, and ‘Help’ will remain accessible from each screen

Navigation buttons will appear at the bottom right hand corner of each screen

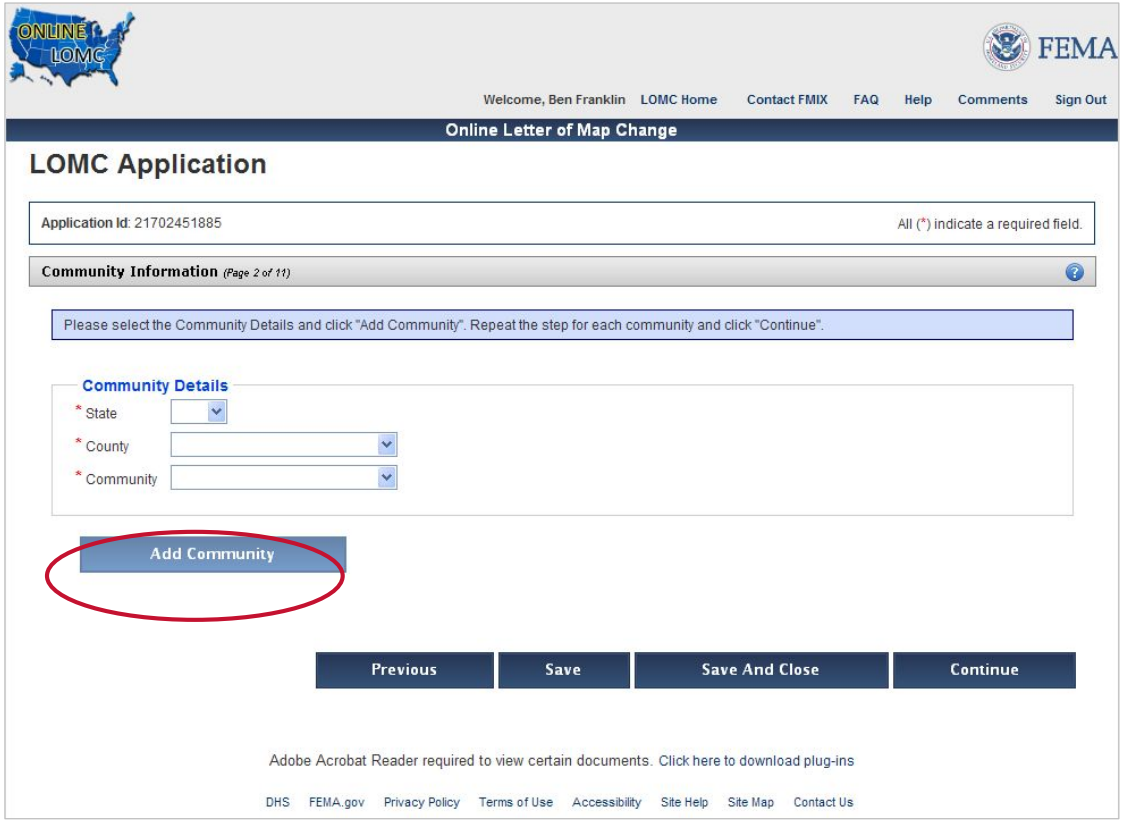
Flood Zone Information

- Enter the required information for the LOMC-targeted property, and click ‘Continue’
- If a construction date is required, you will be prompted to select a month and year



Options will become available, depending on your answer to the questions

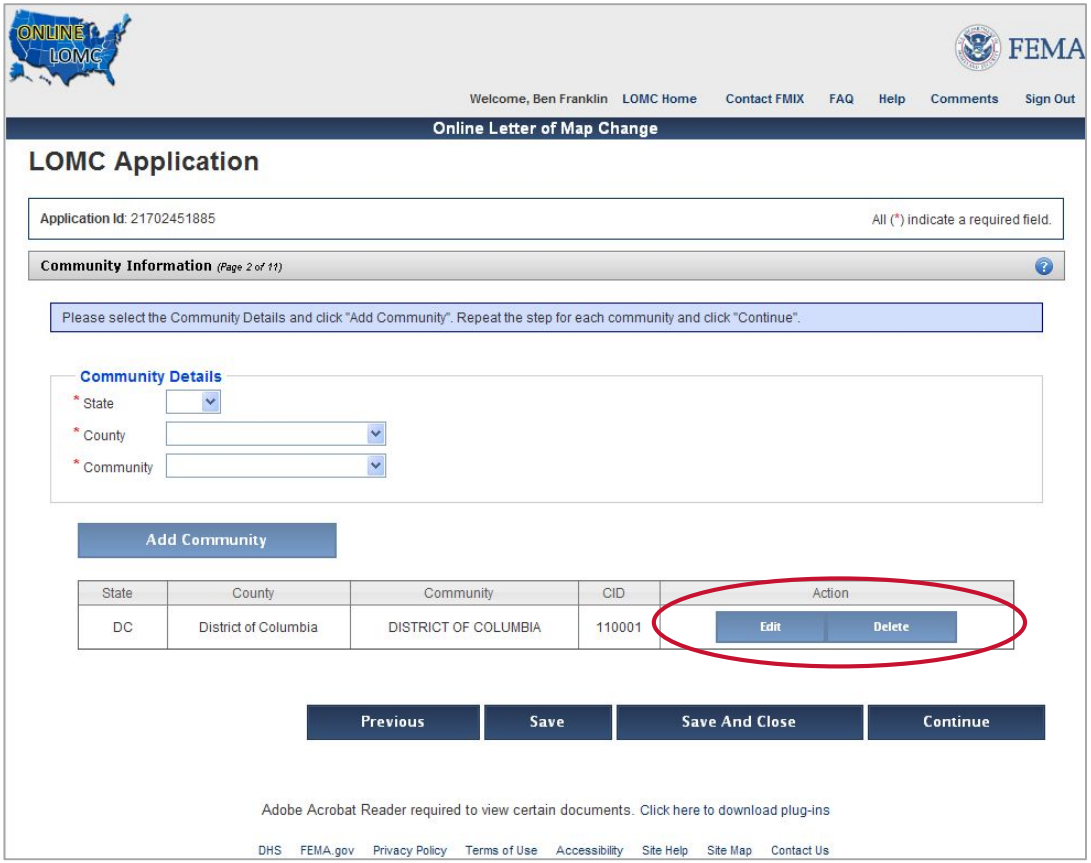
Community Information



- Enter the details for your property's community, then click 'Add Community'
- If you do not know your community, look up this information on the Map Service Center website (www.msc.fema.gov), click 'Help' to learn more

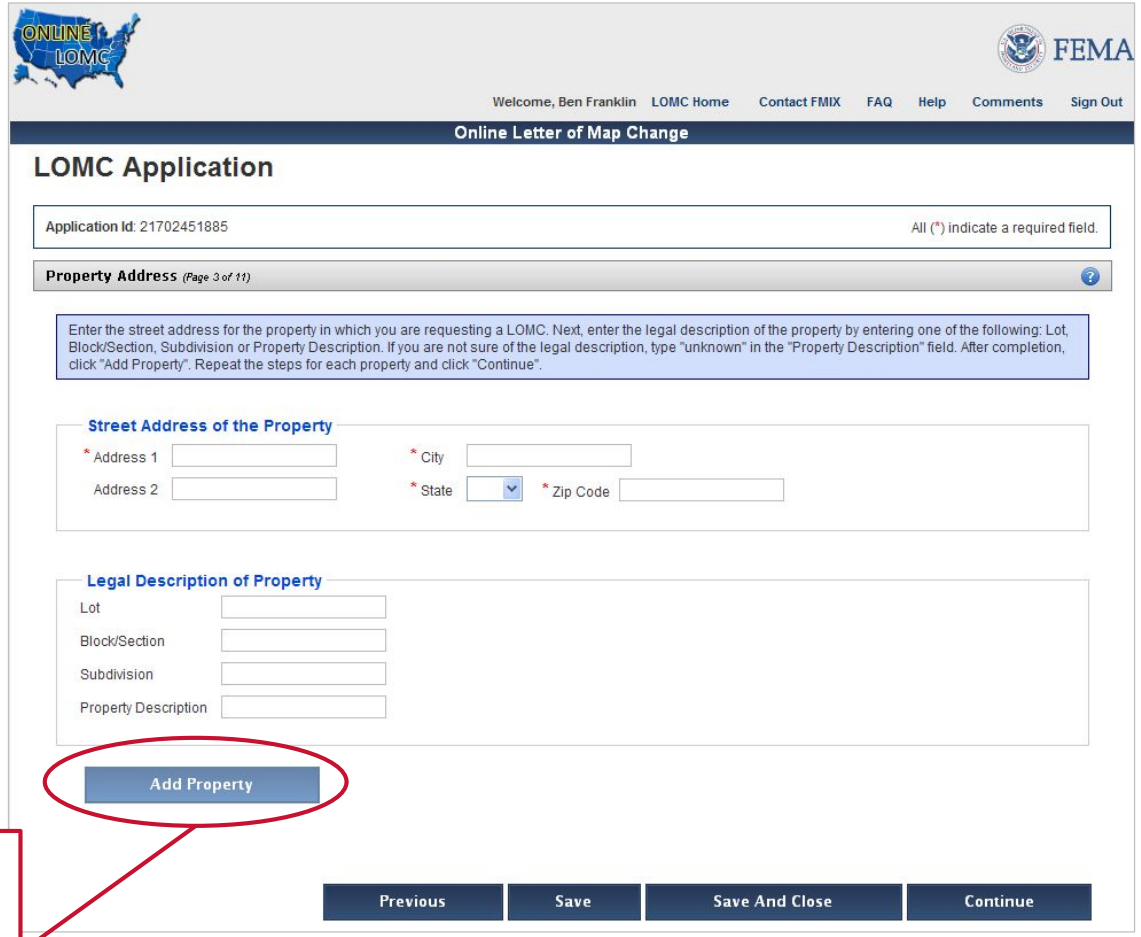
Community Information

You may edit or delete your community information at any time before final submission



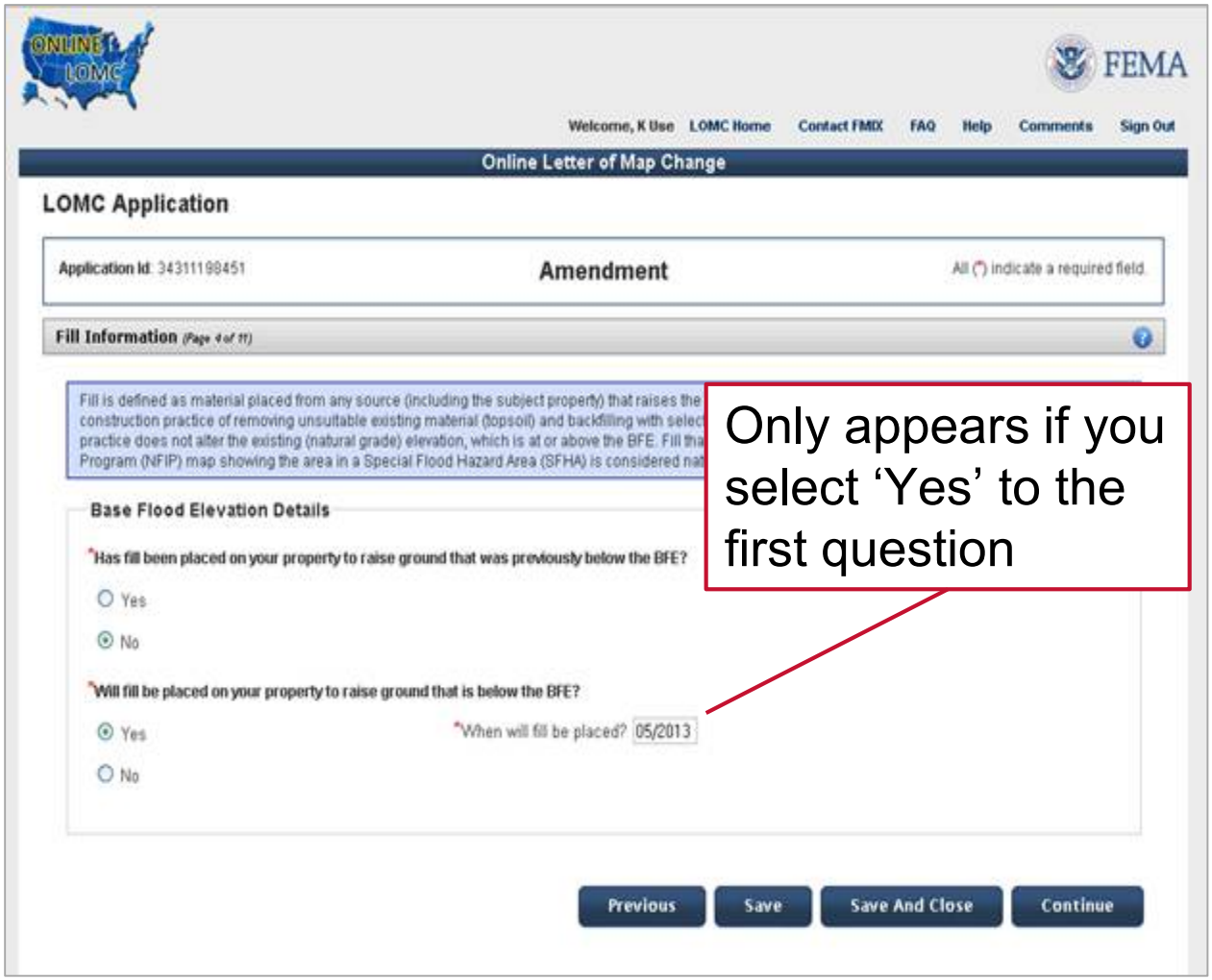
Property Address

- Add the address of the LOMC-targeted property
- Fill in the Lot, Block/Section and/or subdivision
- If you do not know this information, enter a property description in order to advance to the next screen



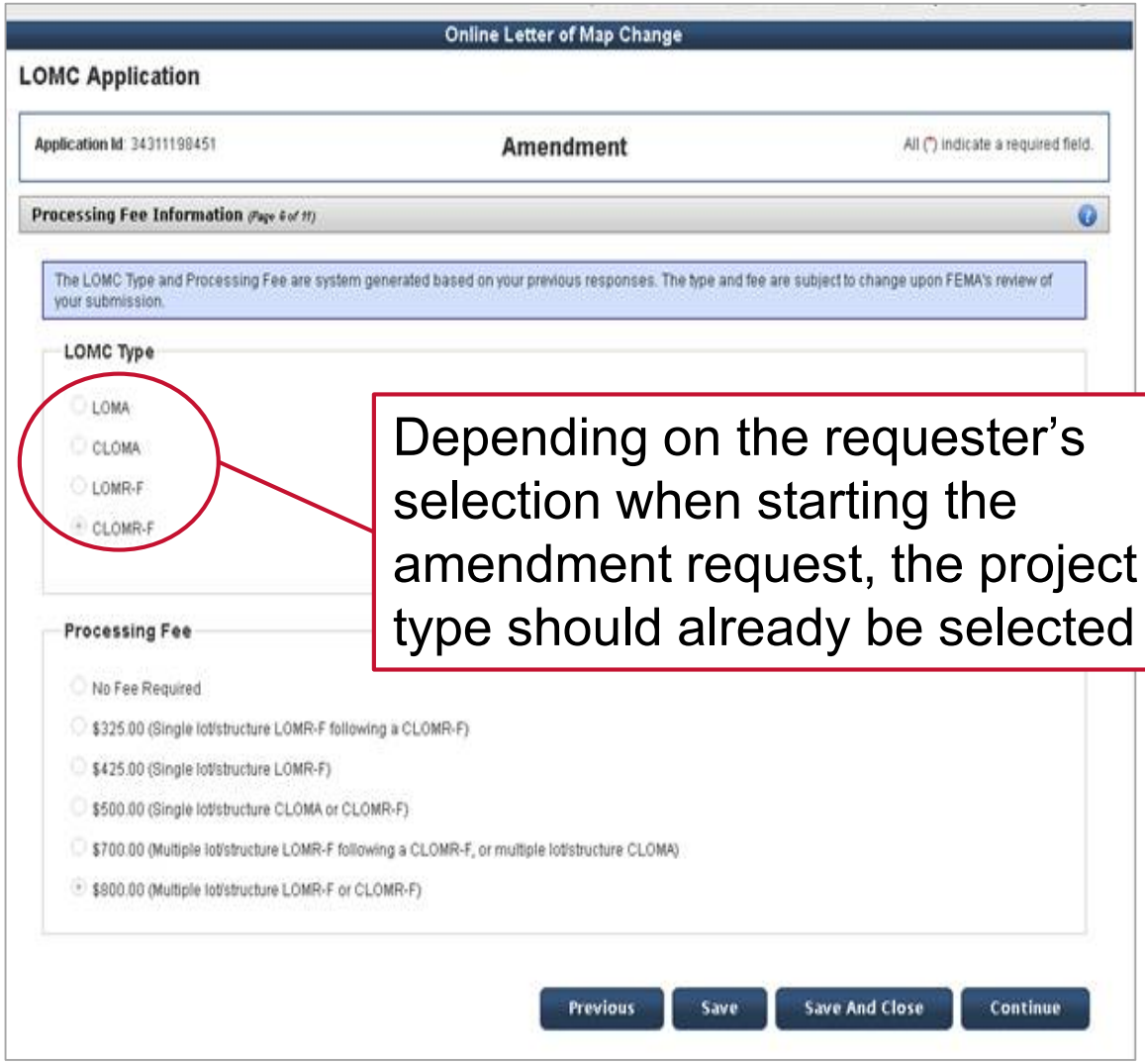
Click ‘Add Property’ after all information has been entered, then continue

Fill Information



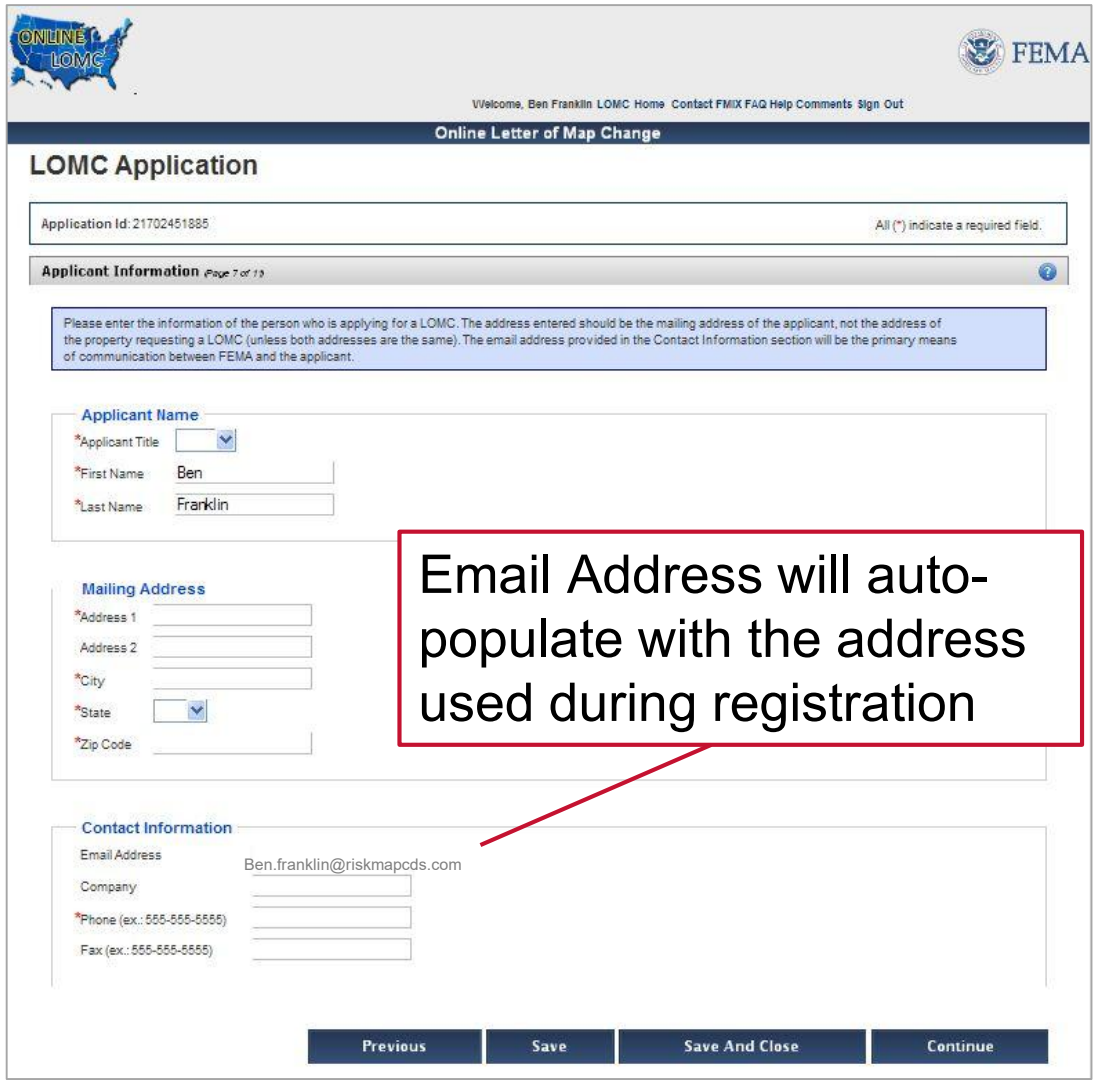
- Applicants must confirm whether or not fill was placed on the property and provide the month and year fill was placed
- If fill has not been placed, applicants must confirm whether fill will be placed on the property in the future

Processing Fee Information



- The processing fee amount is determined based on responses entered the amendment request
- There are no fees for LOMA requests

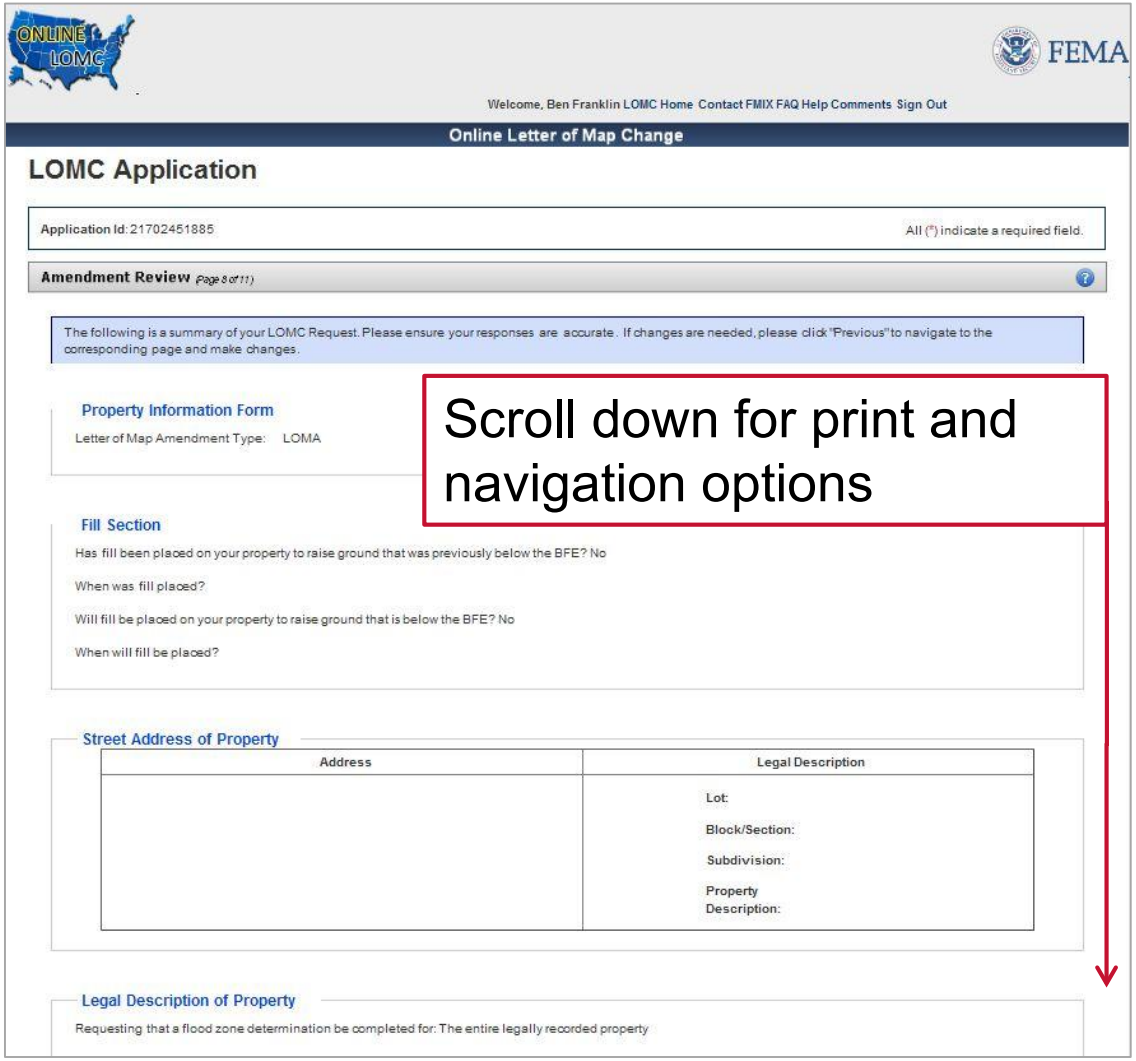
Applicant Information



- Enter the information of the person with whom FEMA may contact for questions
- Enter the mailing address of the applicant – it does not have to match the LOMC property
- You can always update the name and email address from the 'Update Profile' button on the 'Application Status' page

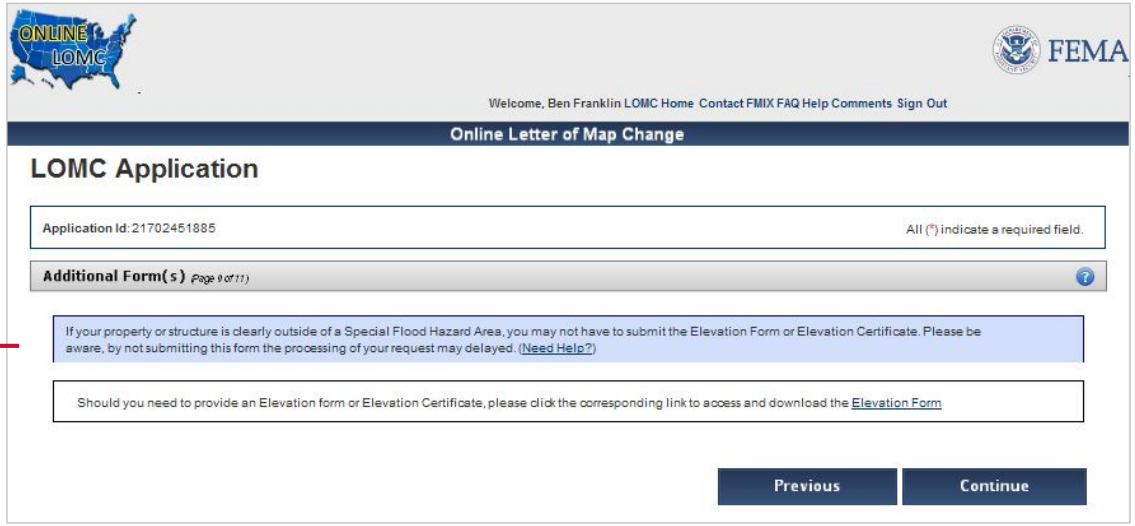
Amendment Review Page

- Summary of all the information entered
- At the bottom of the screen, you have the option to print
- If information entered is not correct, select the 'Previous' button at the bottom right of the page to go back and edit the information



Additional Forms

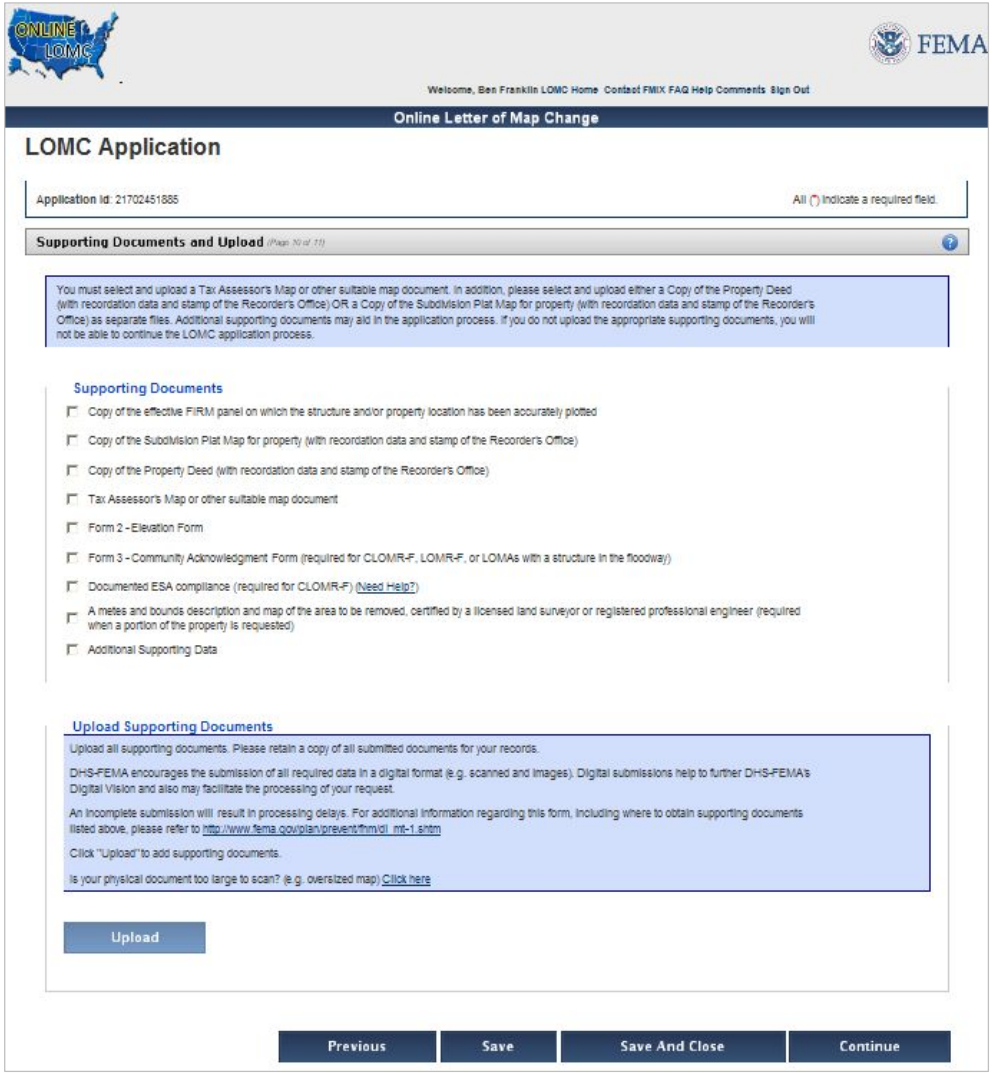
Access the Elevation Form here



- Most LOMC requests require an Elevation Form
- Elevation Forms must be certified by a licensed engineer or surveyor
- You will not be required to upload this document in order to submit a LOMC request, however, if FEMA requests an Elevation Form after you submit the LOMC request, it may delay the determination
- An Elevation Certificate may be submitted in lieu of the Elevation Form

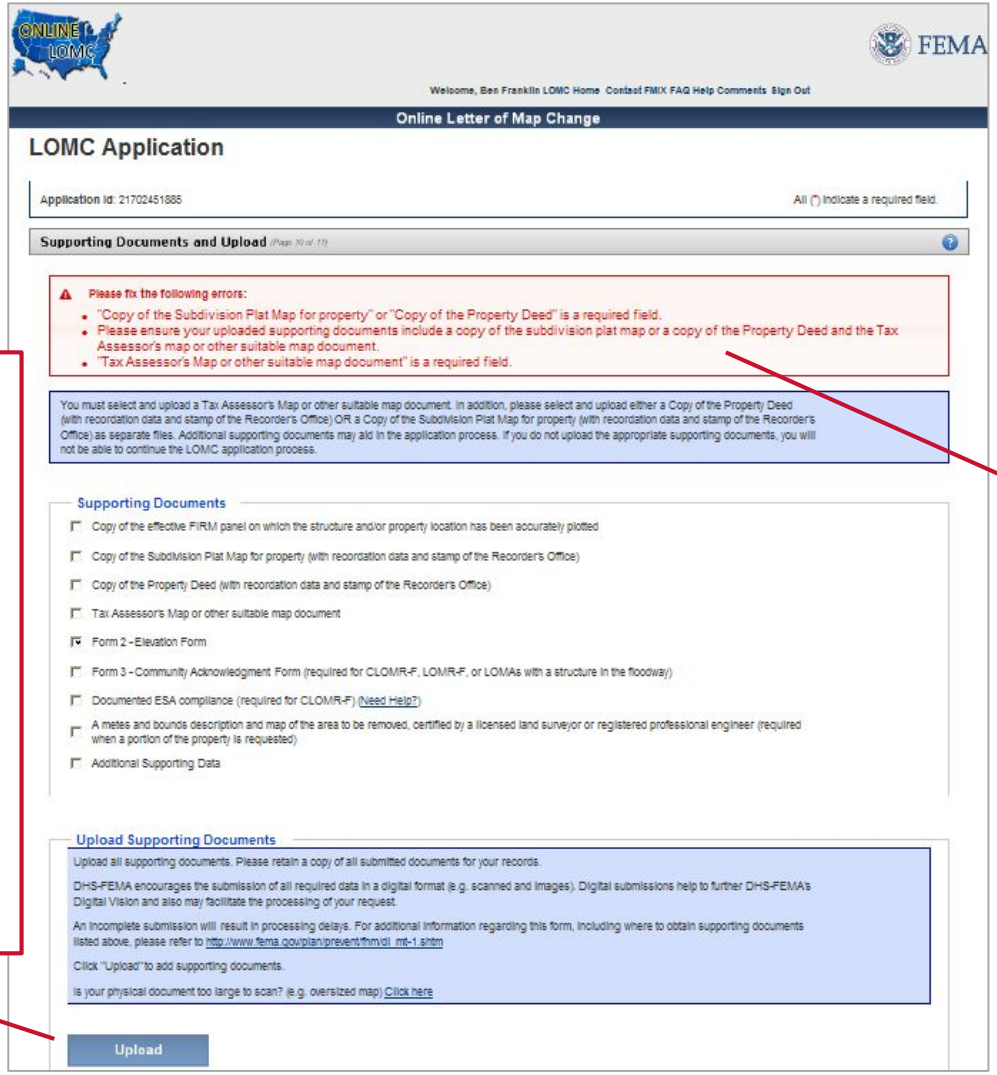
Supporting Documents and Upload

- You must select both:
  - Tax assessors map or other suitable map document;
  - Copy of Property Deed OR Subdivision Plat Map
- If you plan to submit the Elevation Form/Certificate at this time, select ‘Form 2 – Elevation Form’
- Select ‘Upload’ to attach the scanned documents
- Other supporting documents may also be uploaded



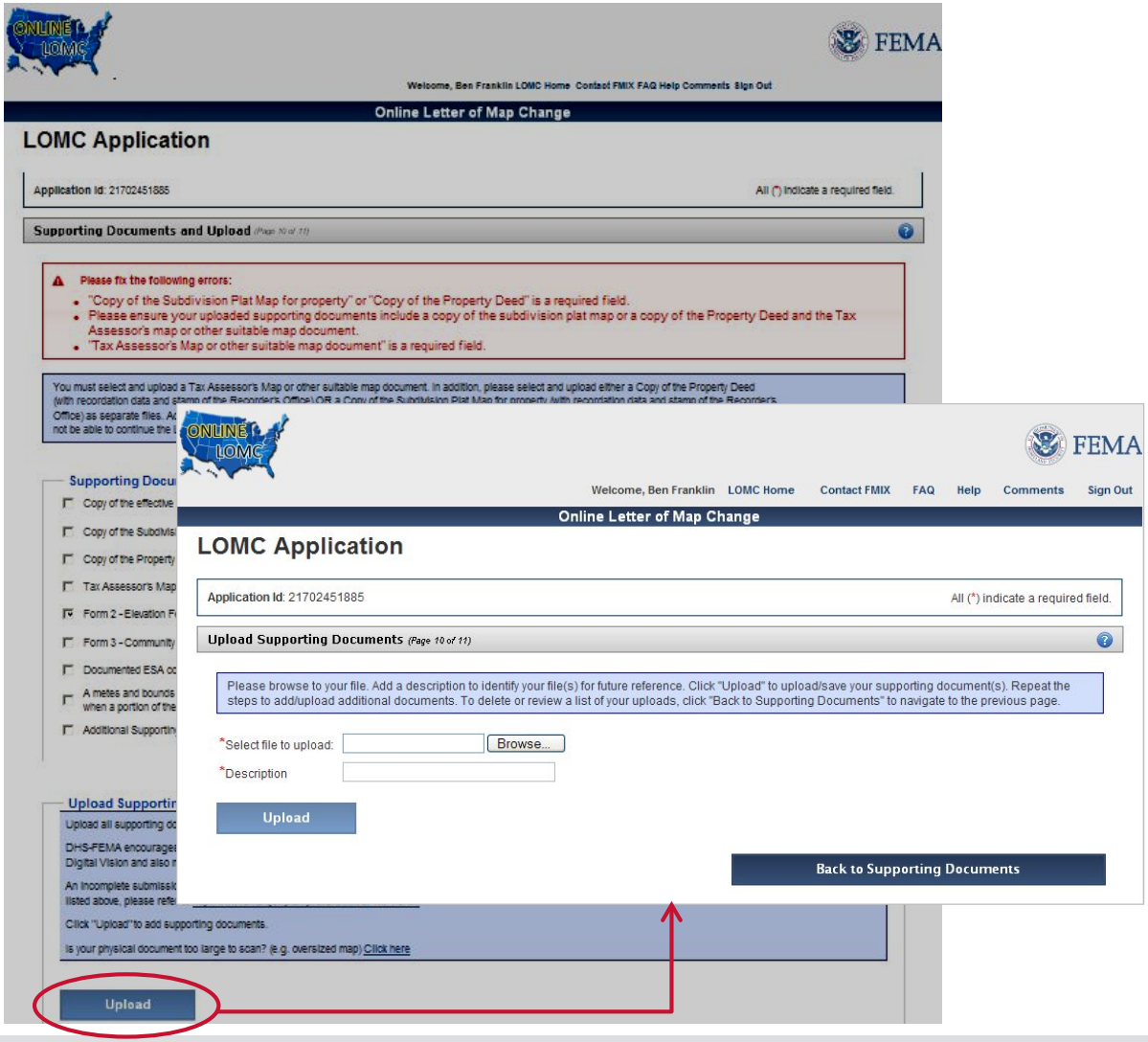
Supporting Documents and Upload

Upload the required information. If additional information is needed, you will receive an email from a FEMA representative



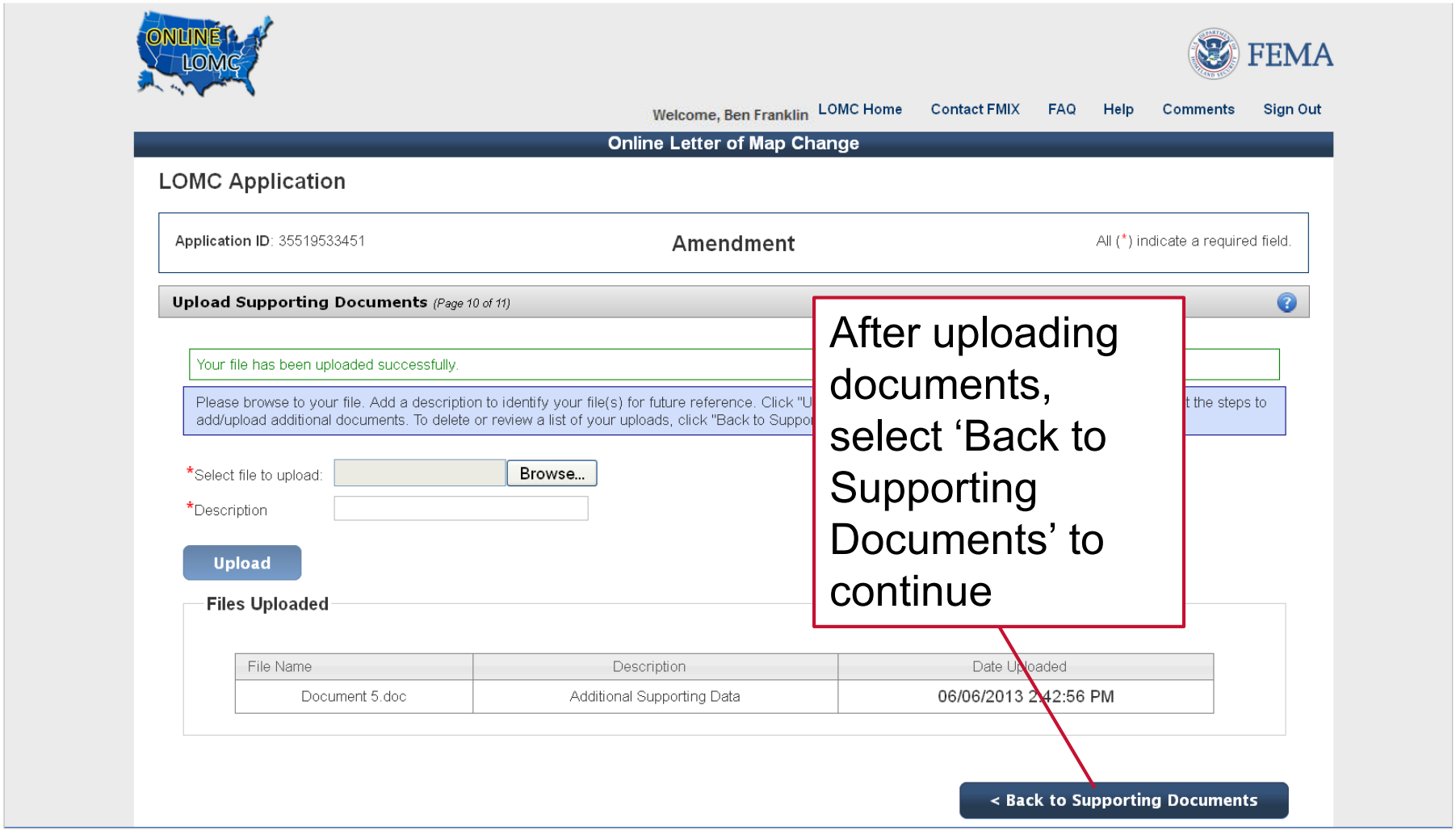
If you do not check all of the necessary supporting documents, this error message displays

Upload Supporting Documents



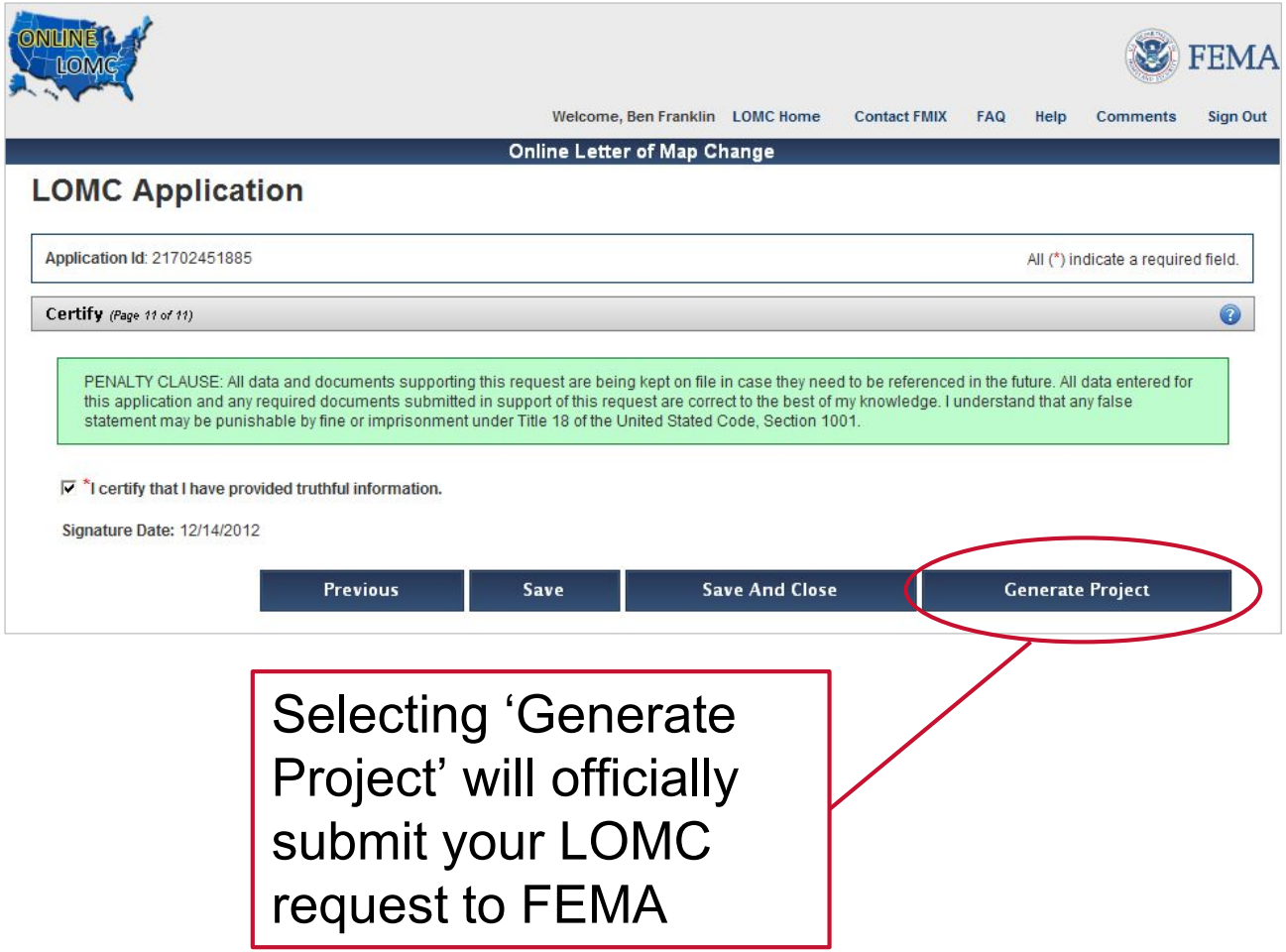
- Collect (or fill out) the required supporting documents
- Scan and save them to your computer
- Selecting 'Upload' will allow you to search for the scanned supporting documents on your computer and attach them to the application
- You may upload all your supporting documents here

Upload Supporting Documents



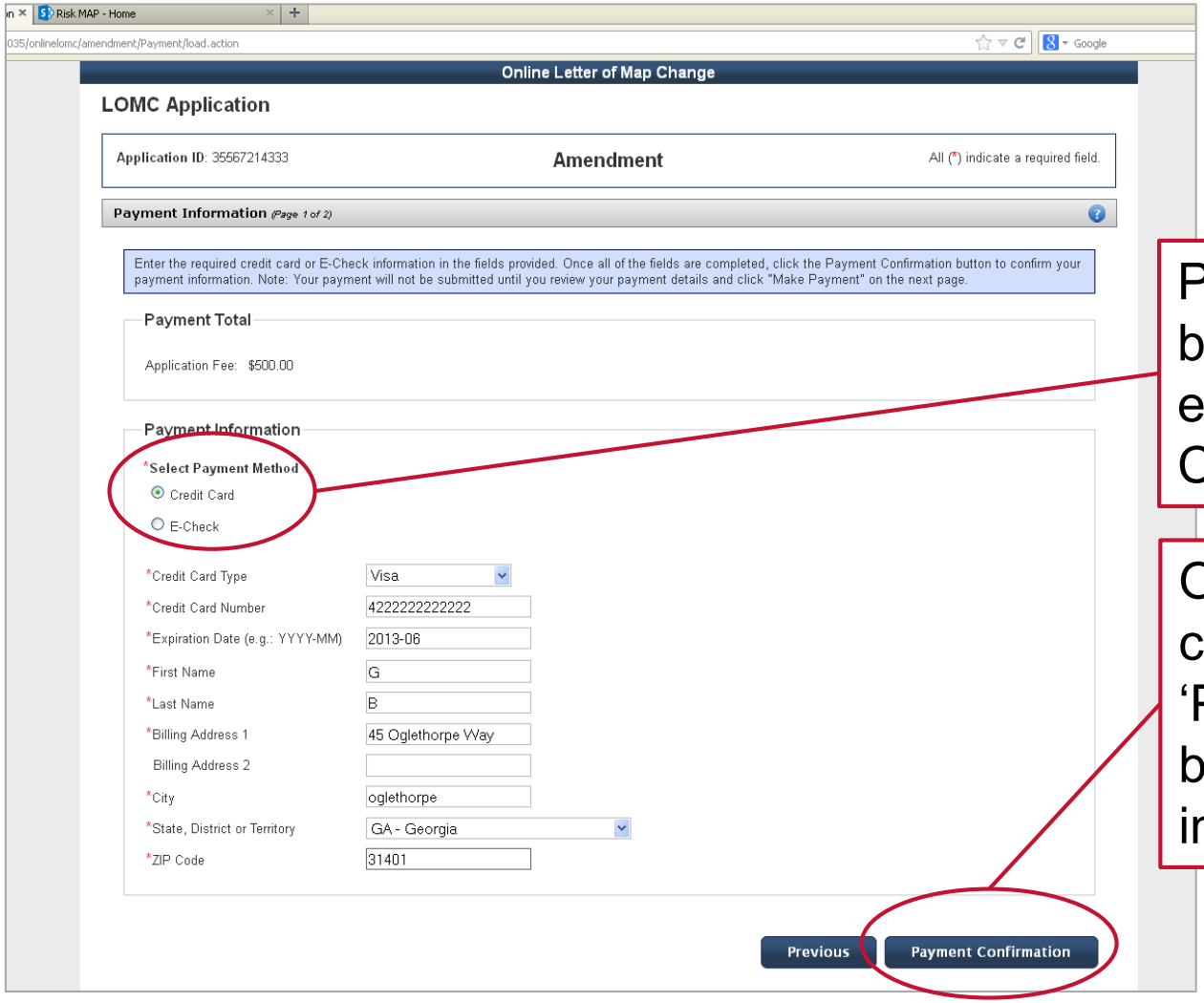
Certify

- Penalty clause
- Certify the information is correct to the best of your knowledge
- You cannot edit the information after you ‘Generate Project’
- Select ‘Generate Project’ when ready to initiate your LOMC request, or click ‘Previous’ to edit the information



Selecting ‘Generate Project’ will officially submit your LOMC request to FEMA

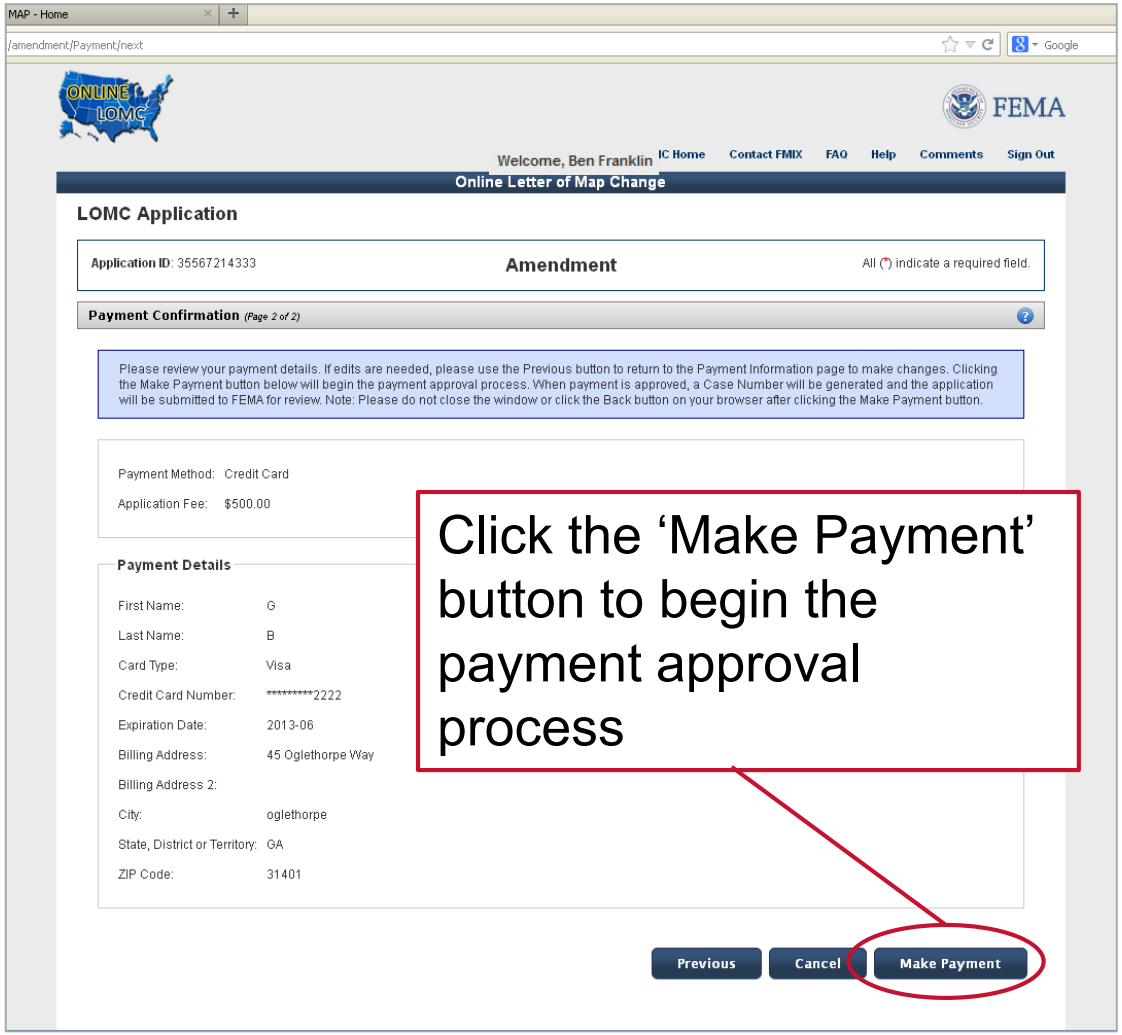
Making a Payment



Payment must be made by a credit card or electronic check (E-Check)

Once all fields are completed, click the 'Payment Confirmation' button to confirm payment information

Payment Confirmation



Click the 'Make Payment' button to begin the payment approval process

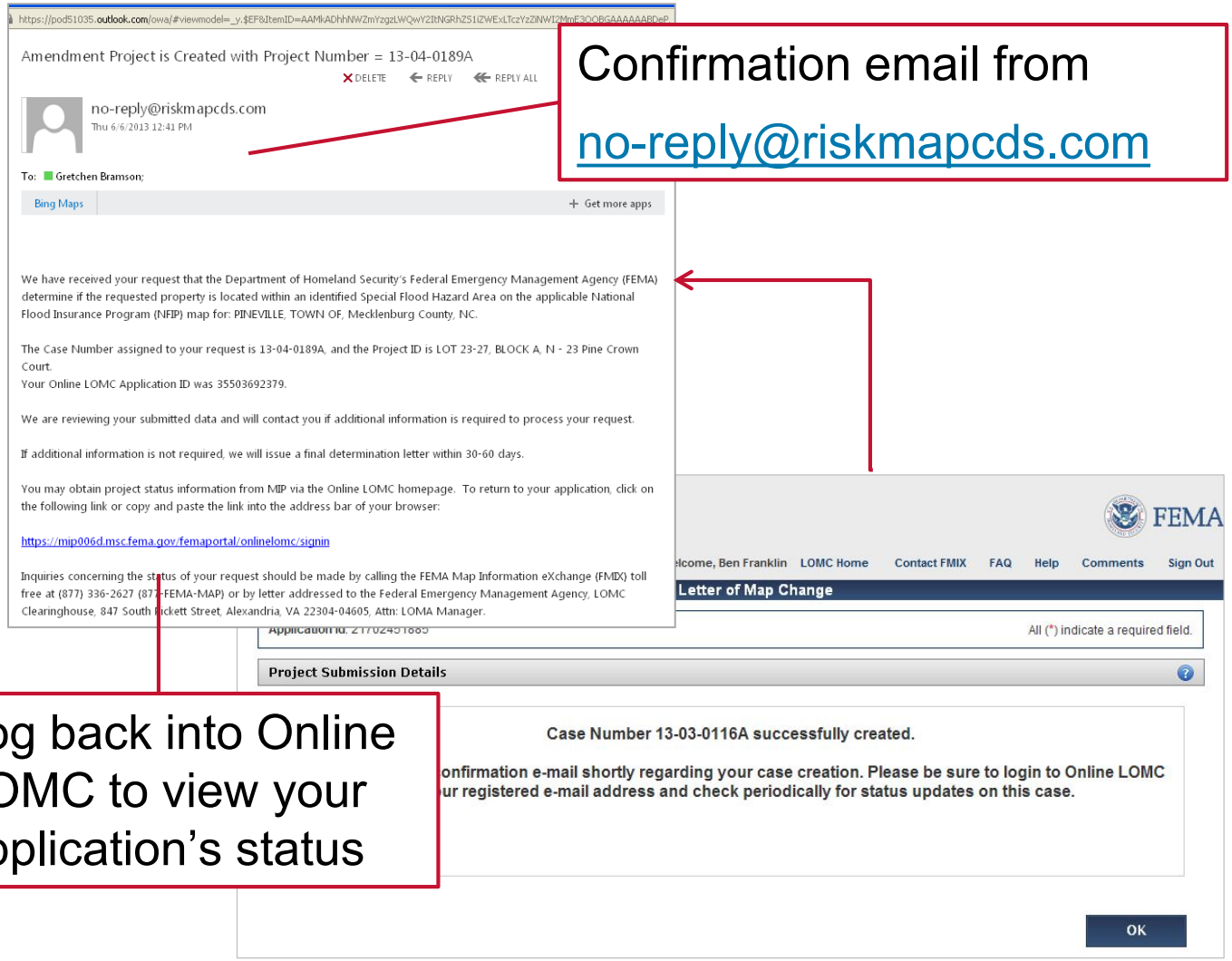
- Review payment details to ensure information accuracy. To make changes to your payment information, select the 'Previous' button
- If payment is submitted by E-Check, a case number will not be immediately generated
- Once the payment is processed, a case number will be generated and FEMA will begin reviewing the request

Payment Confirmation: Refunds

- If an overpayment is made and a refund is required, please note that refunds cannot be processed directly through Online LOMC
- You will be contacted by a FEMA representative who will work with you through the refund process
- Refunds may be processed by sending a paper check

Project Submission Details

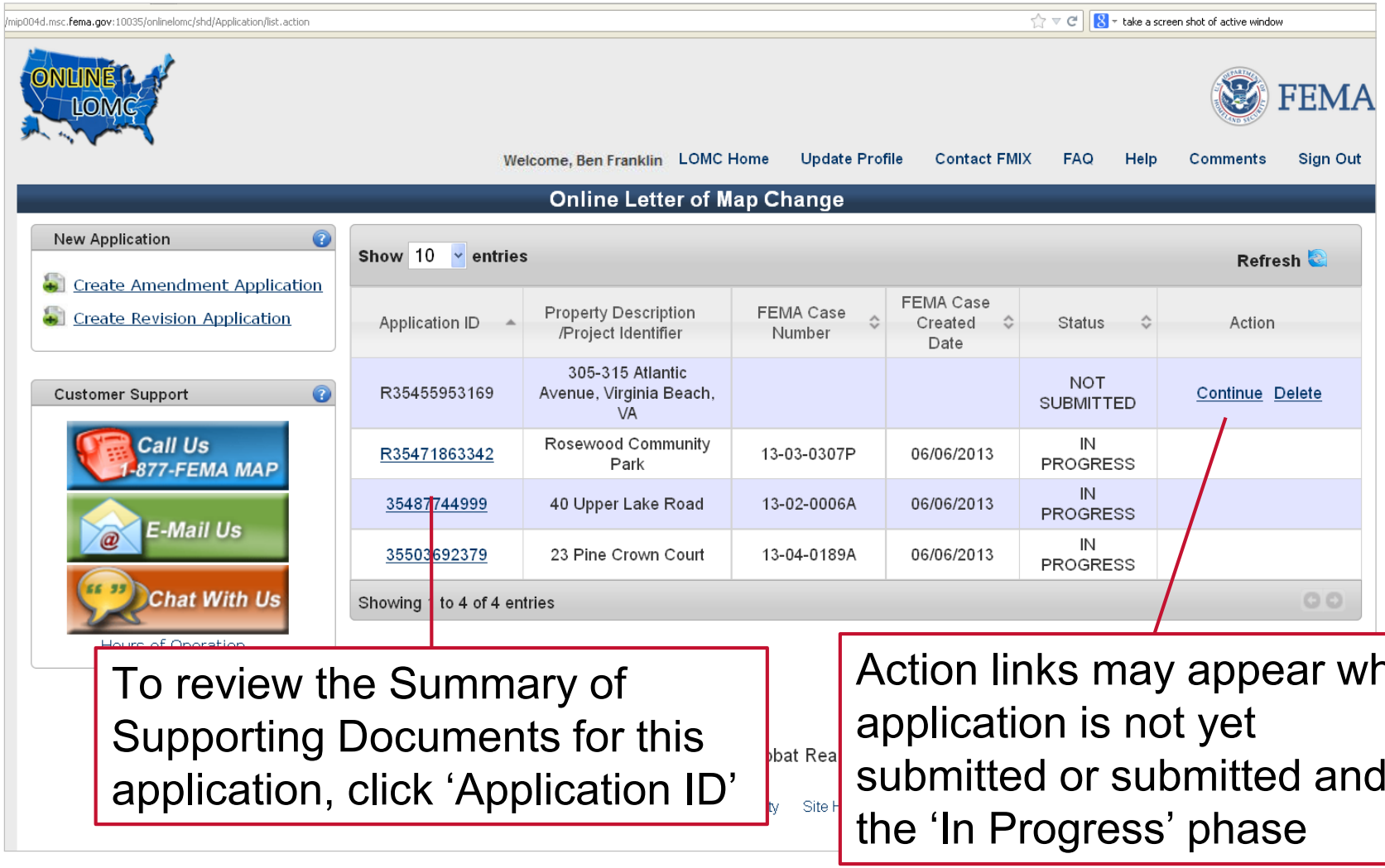
After you generate a project, you will get a Case Number (different than an Application ID)



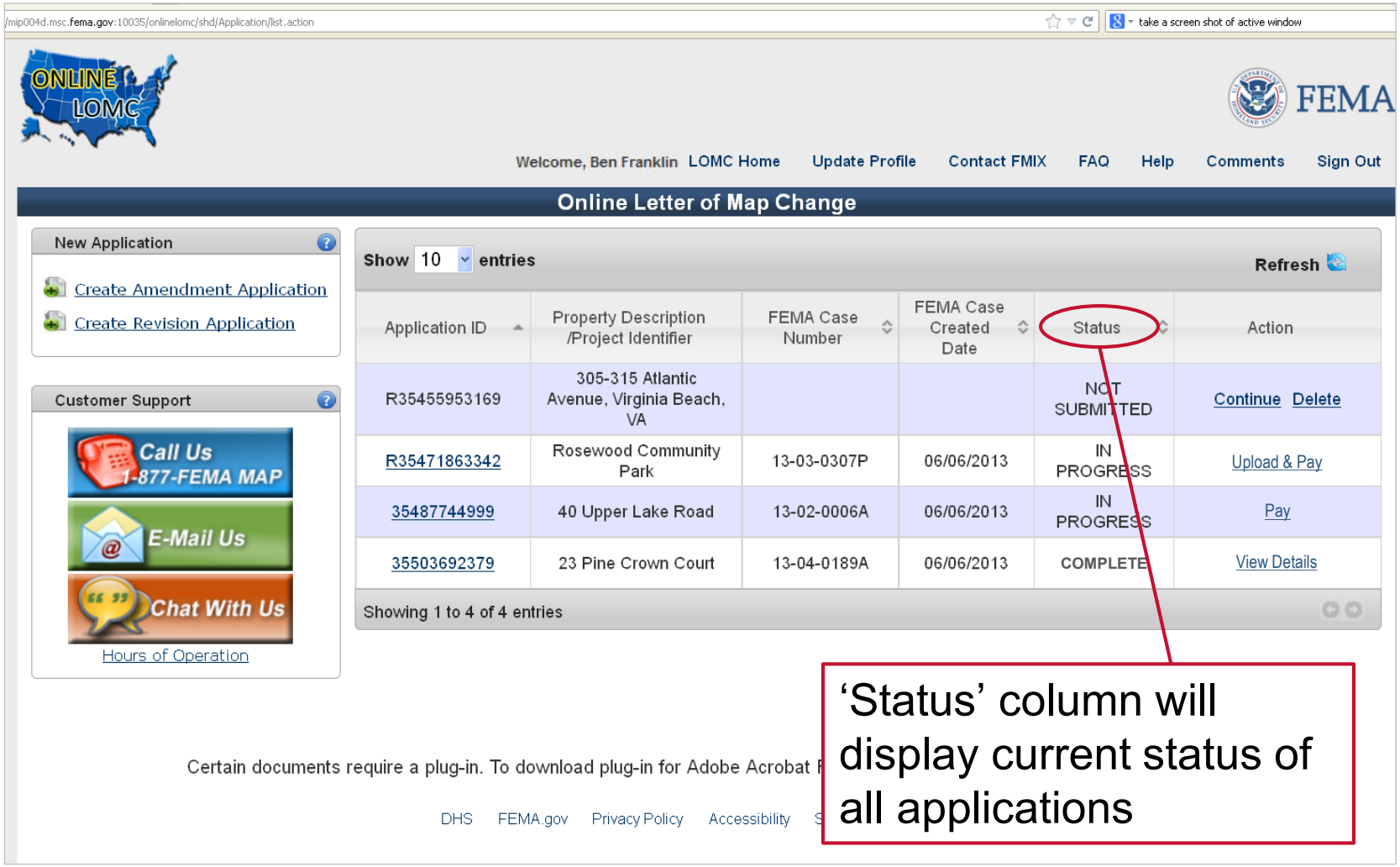
Confirmation email from no-reply@riskmapcds.com

Log back into Online LOMC to view your application's status

Application Status Page



Application Status Page: Status



Application Status Page: Status Types

Several types of 'Status' may display:

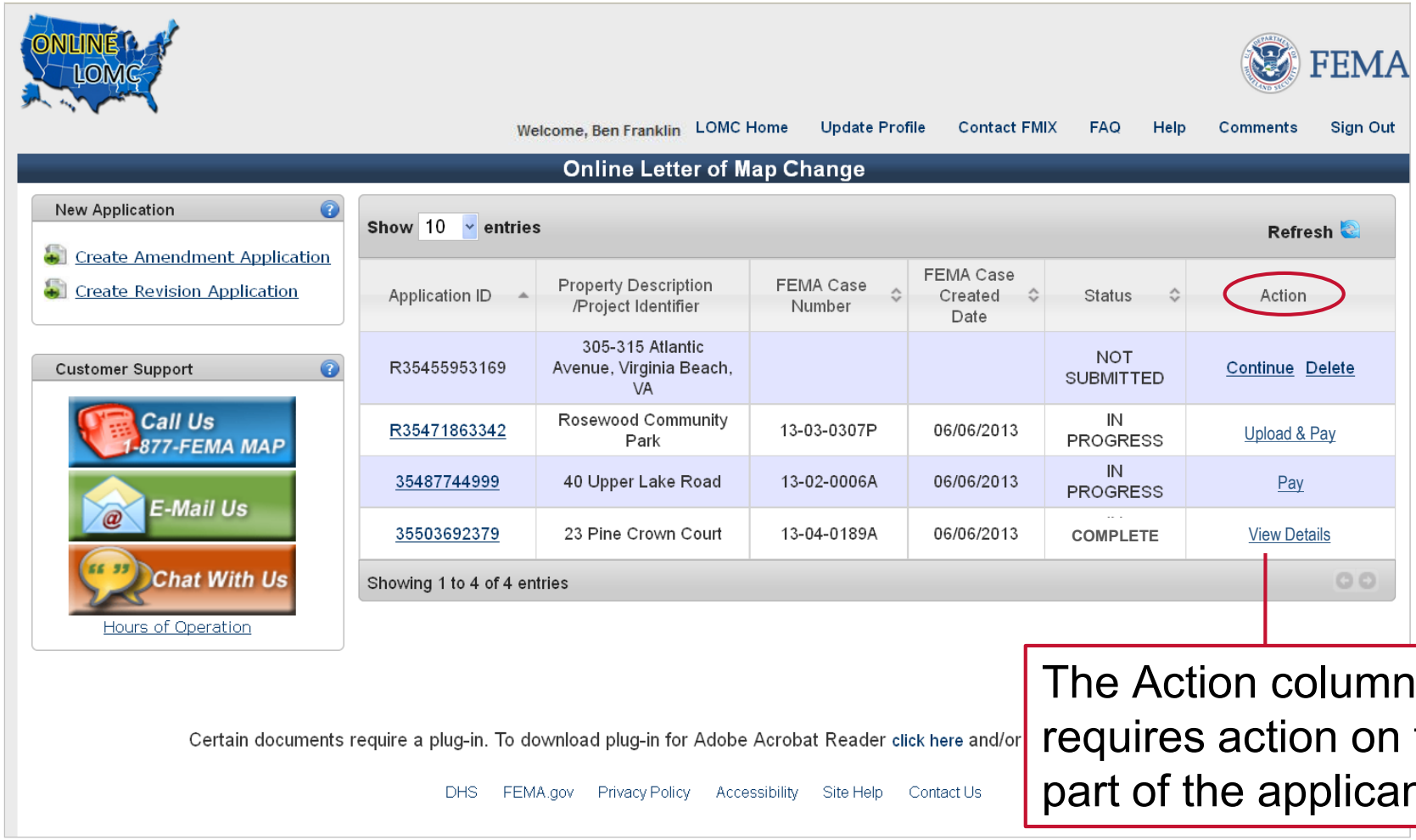
- Not Submitted – Application has been started, but is not yet submitted to FEMA
- Complete – Application has been submitted, reviewed by FEMA and a Determination, Violation letter, or other response was issued
- In Progress – Application has been submitted, and is under review by FEMA
- Removed – Application was not submitted to FEMA and was removed from Online LOMC after 34 days of inactivity

Application Status Page: Status Types

Status continued:

- Request Data – Application has been submitted to FEMA and FEMA is requesting more data before they can issue a determination
- Request Data/Fee – Application has been submitted to FEMA and FEMA is requesting more data
  Suspended – Application has been submitted to FEMA but was suspended because the applicant did not provide the requested additional data or fee
- Under Review – FEMA determined an NFIP regulation has been violated

Application Status Page: Action Column



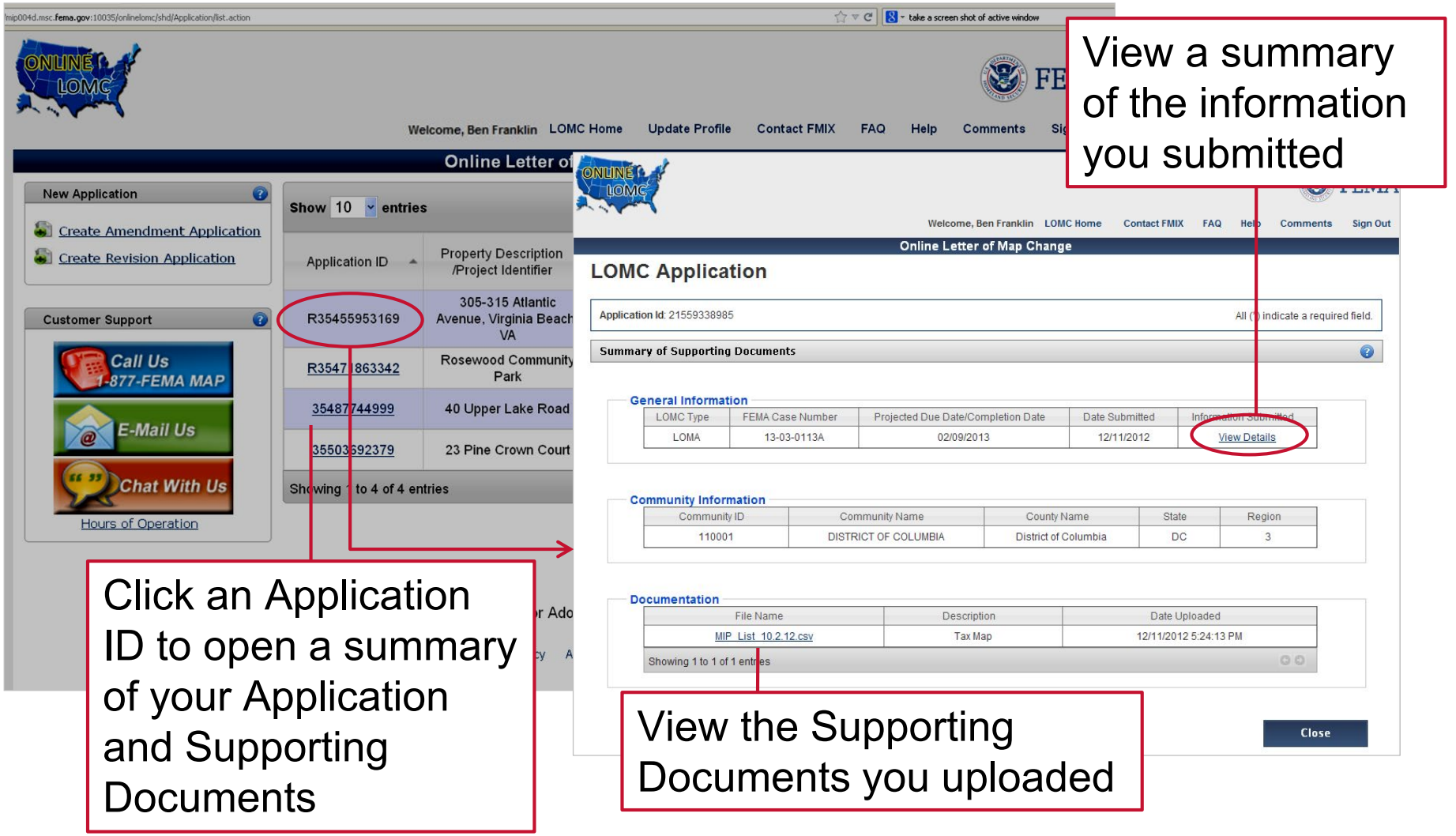
The Action column requires action on the part of the applicant

Application Status Page: Actions Types

Several types of 'Actions' may display:

- Continue - If you started an application but haven't submitted, click 'Continue' to resume applying
- Upload/Pay – FEMA determined that additional documents and/or fees are required
- View Details – For applications submitted to FEMA that are 'In Progress', the applicant can view a summary of the Supporting Documents
- Under Review – The application submitted and adjudicated by FEMA is under review for a determined violation of an NFIP regulation

Application ID on Status Page



View a summary of the information you submitted

Click an Application ID to open a summary of your Application and Supporting Documents

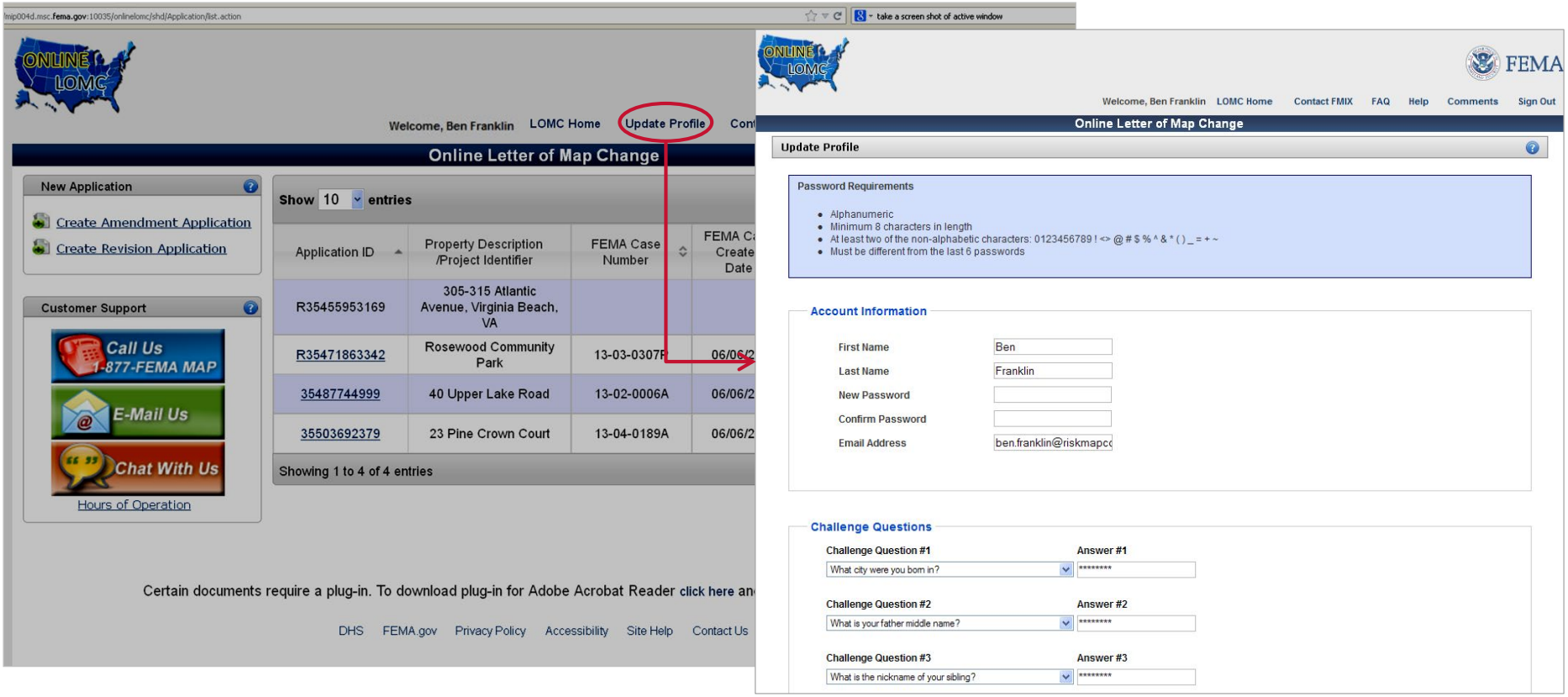
View the Supporting Documents you uploaded

Additional Features of Online LOMC

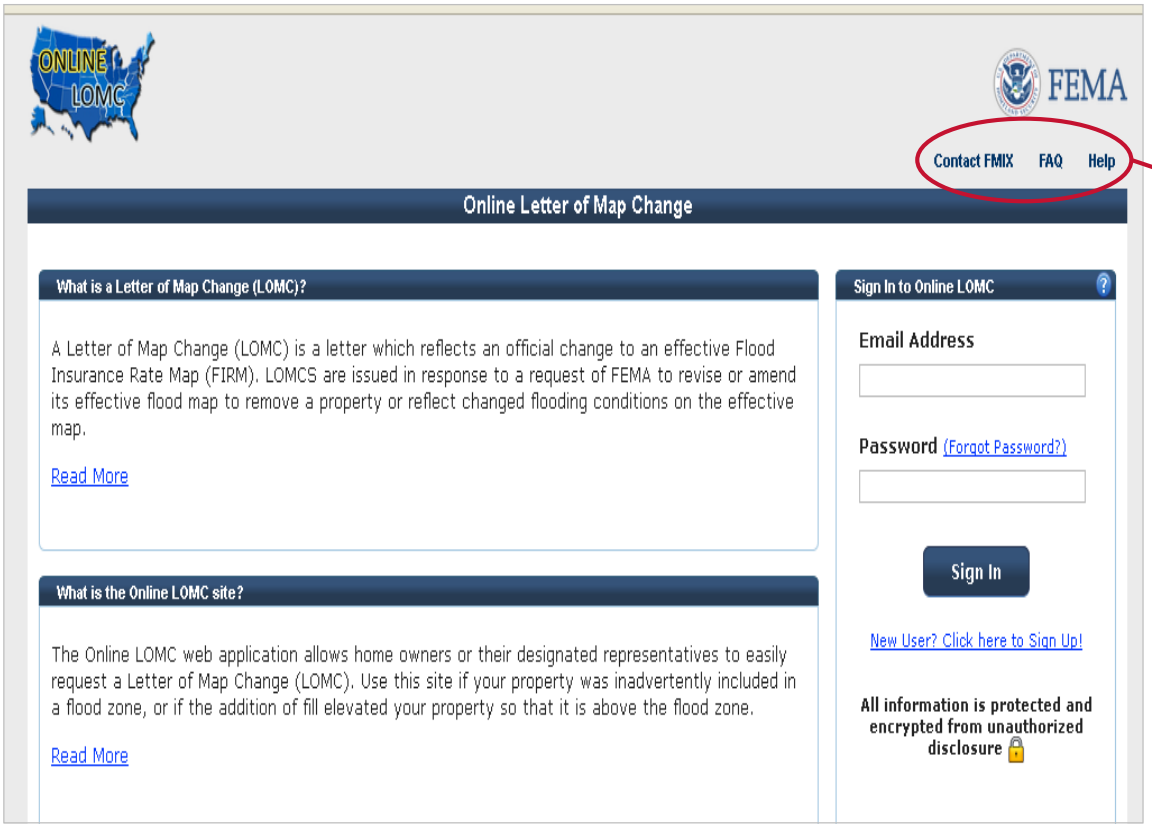
The following slides detail additional features available in Online LOMC

Application Status Page: Update Profile

Click ‘Update Profile’ at the top of the Application Status Page to update your profile

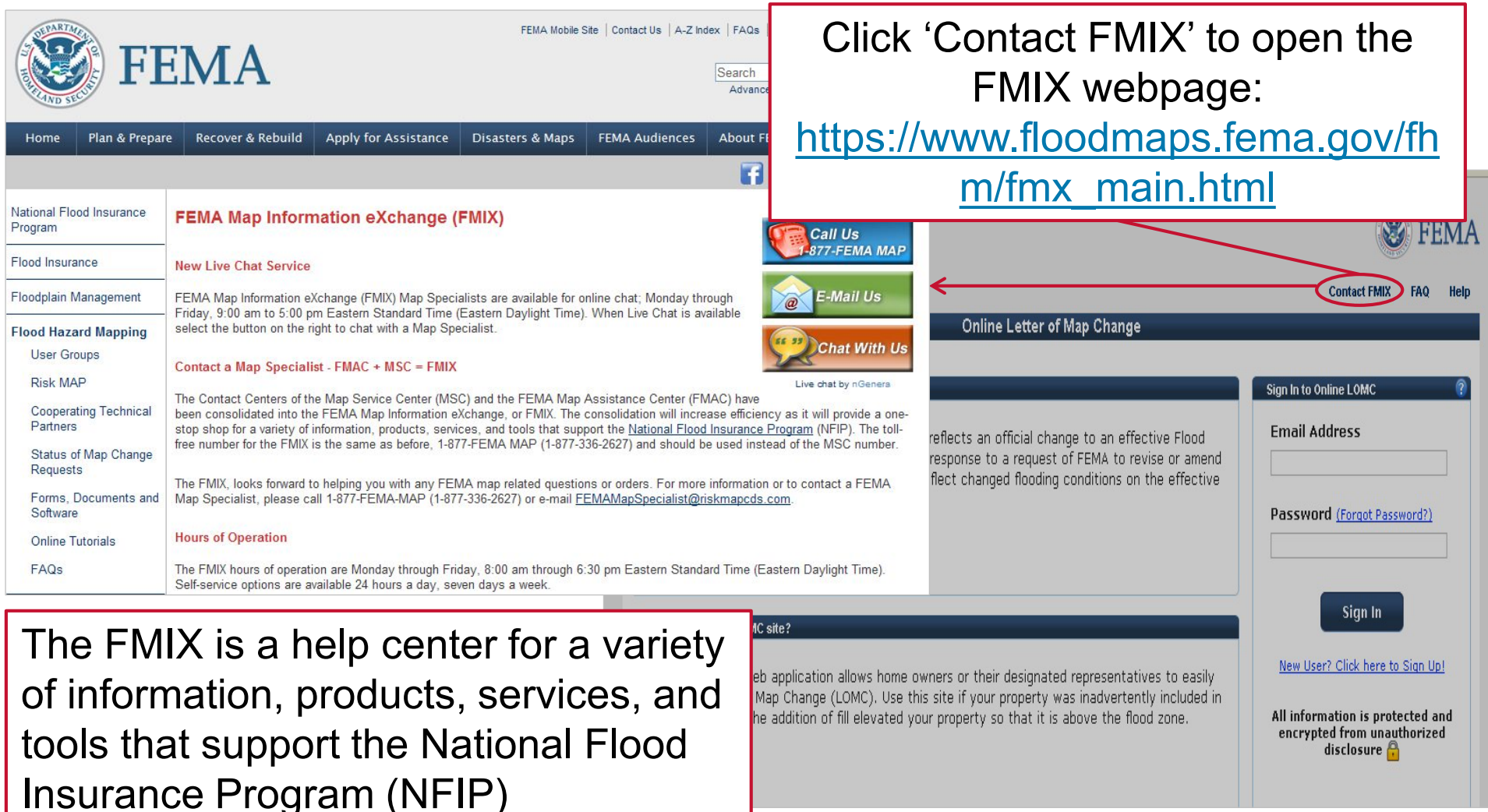


Customer Support: Three Options



Three links are available if you need assistance completing the application:
FAQ
Help
FMIX (FEMA Map Information eXchange)

Customer Support: Contact FMIX



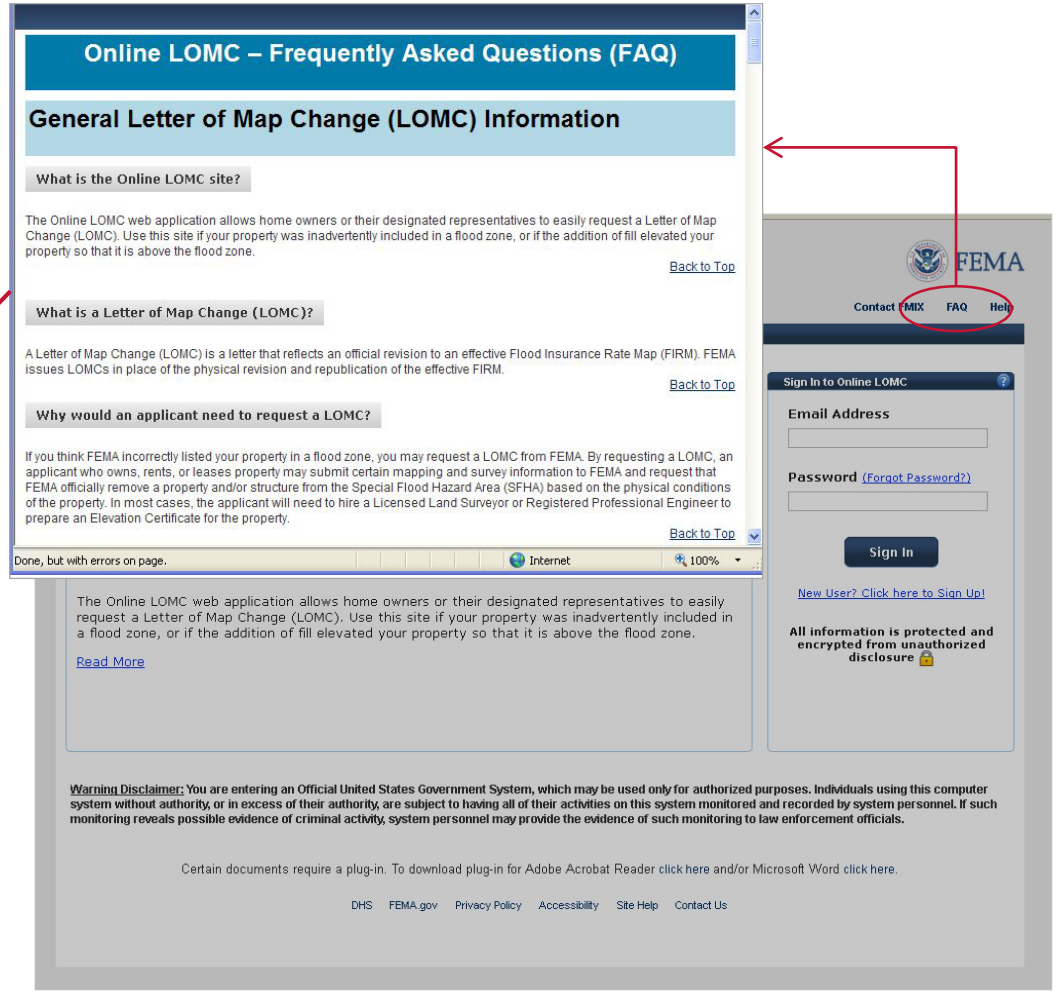
Click 'Contact FMIX' to open the FMIX webpage: https://www.floodmaps.fema.gov/fhm/fmx_main.html

The FMIX is a help center for a variety of information, products, services, and tools that support the National Flood Insurance Program (NFIP)

Customer Support: FAQ

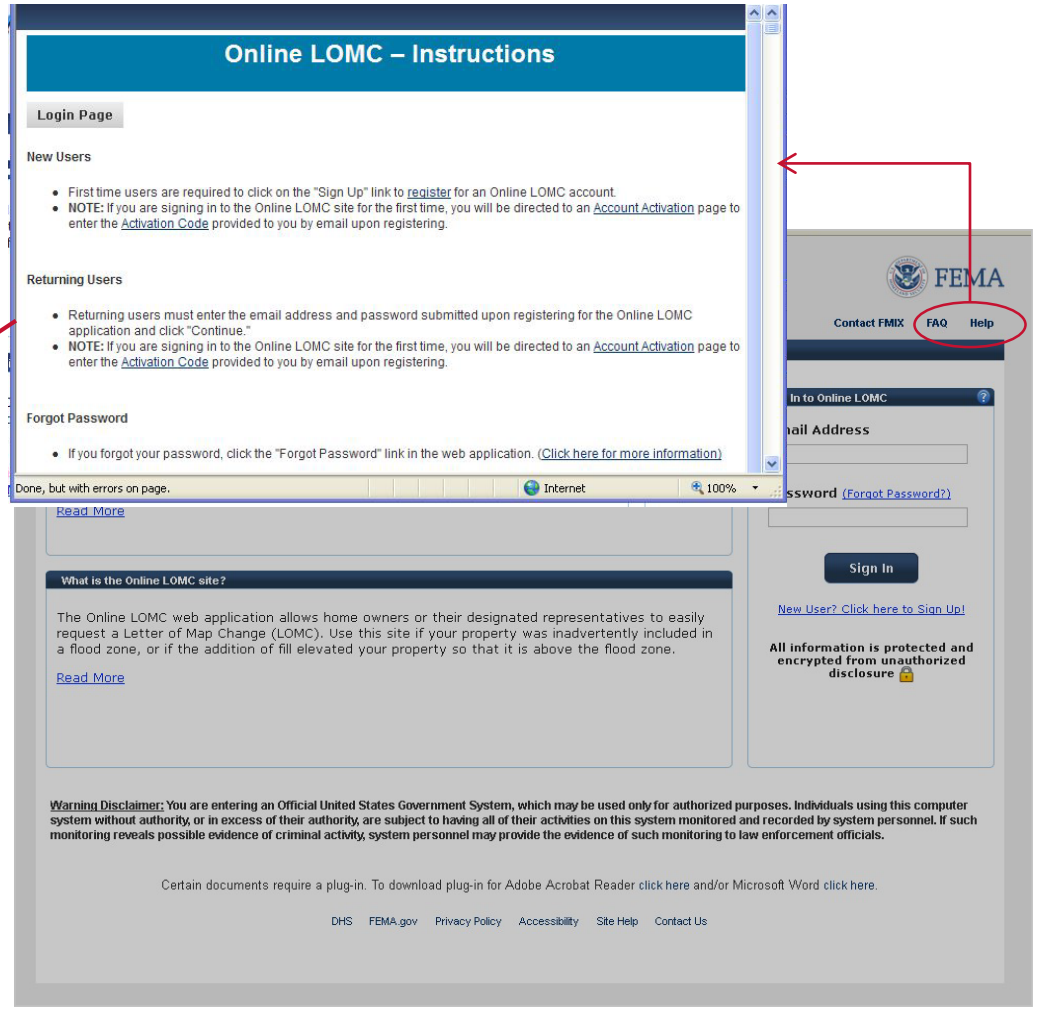
Click the FAQ link in the top right-hand corner of each page, a separate window will open containing Frequently Asked Questions

FAQ opens in a separate window, with information displayed categorically



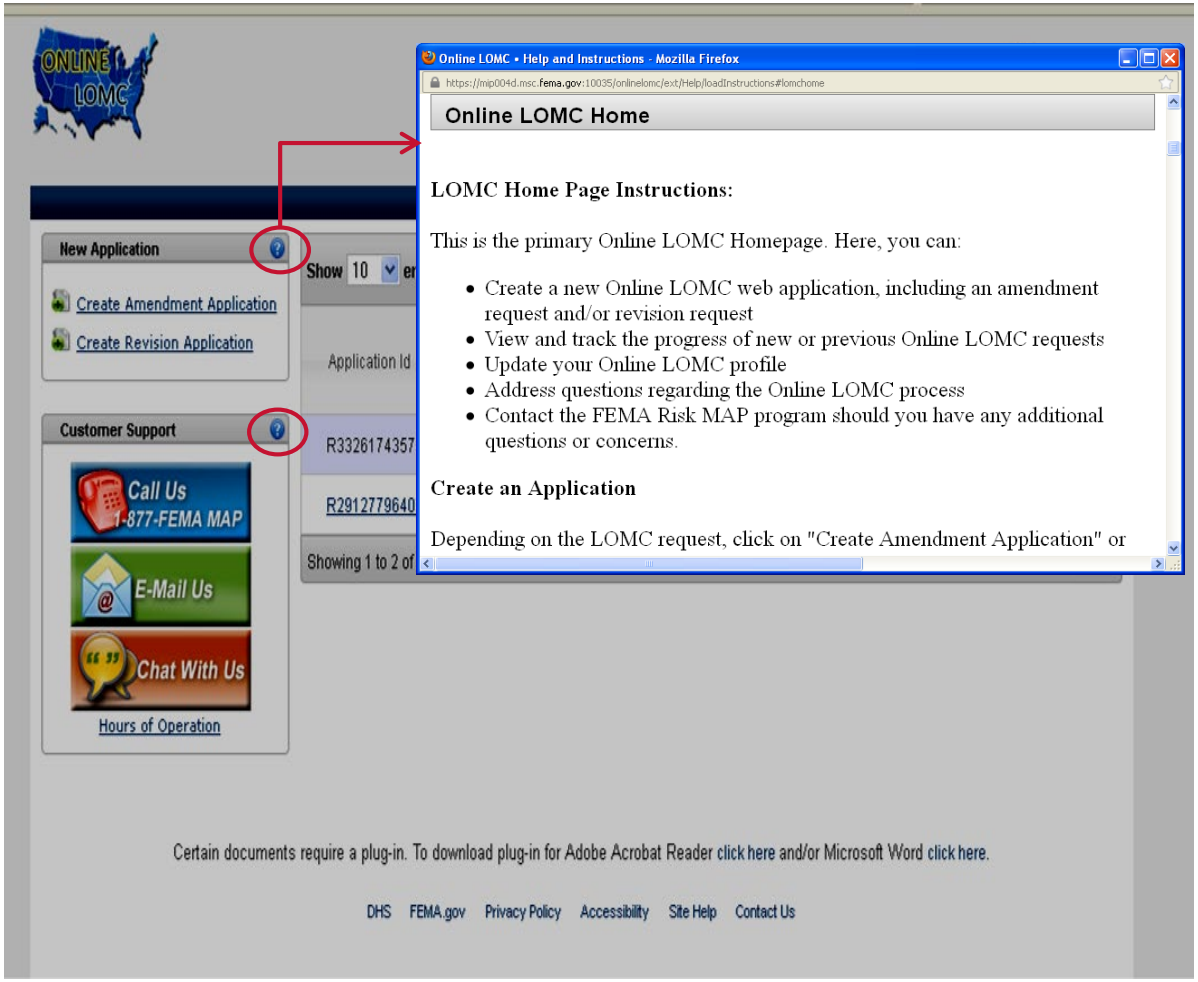
Customer Support: Help

Click the Help link in the top right-hand corner of each page to open a separate instructions window



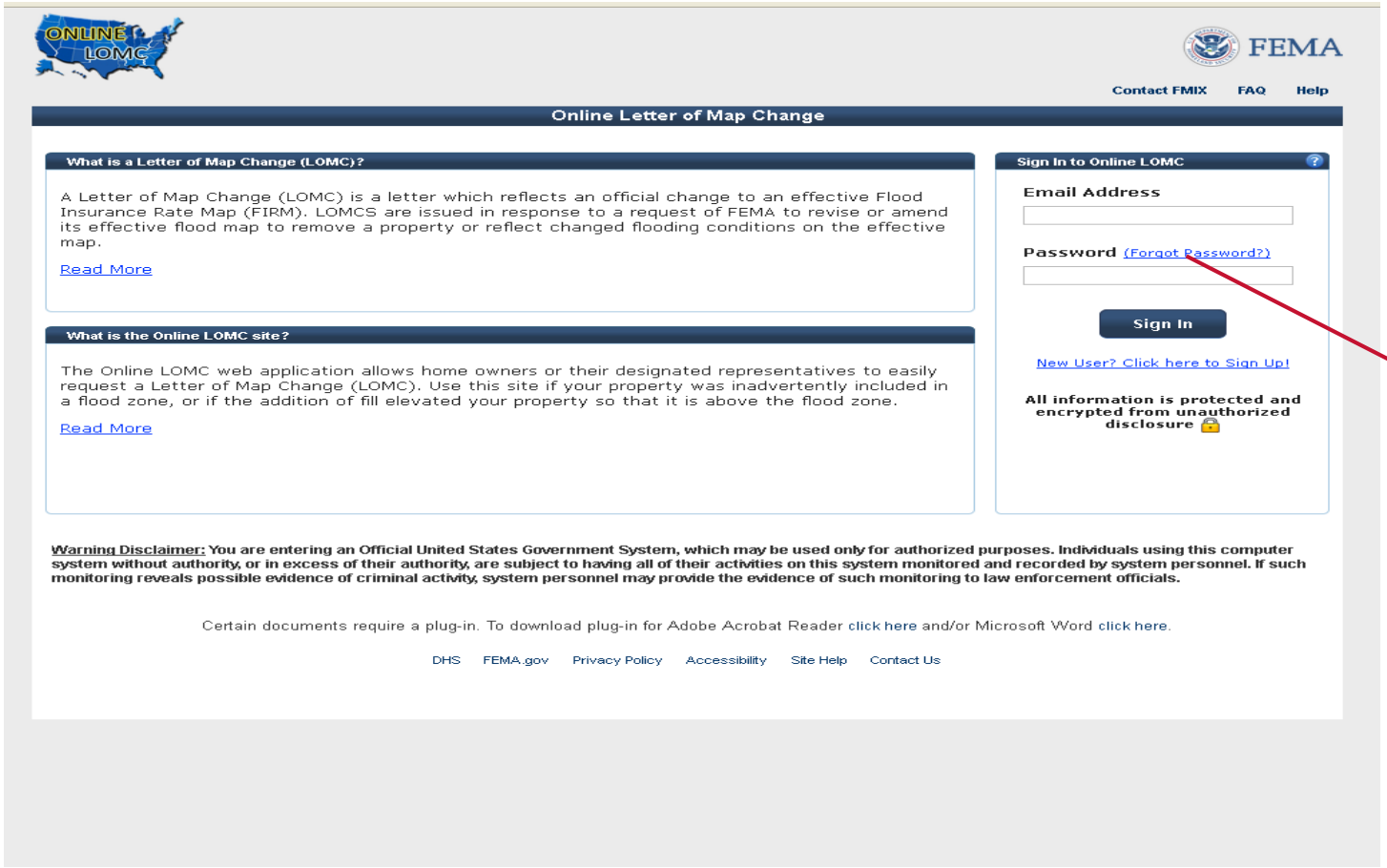
Help opens in a separate window, with information organized by submission step

Question Marks?



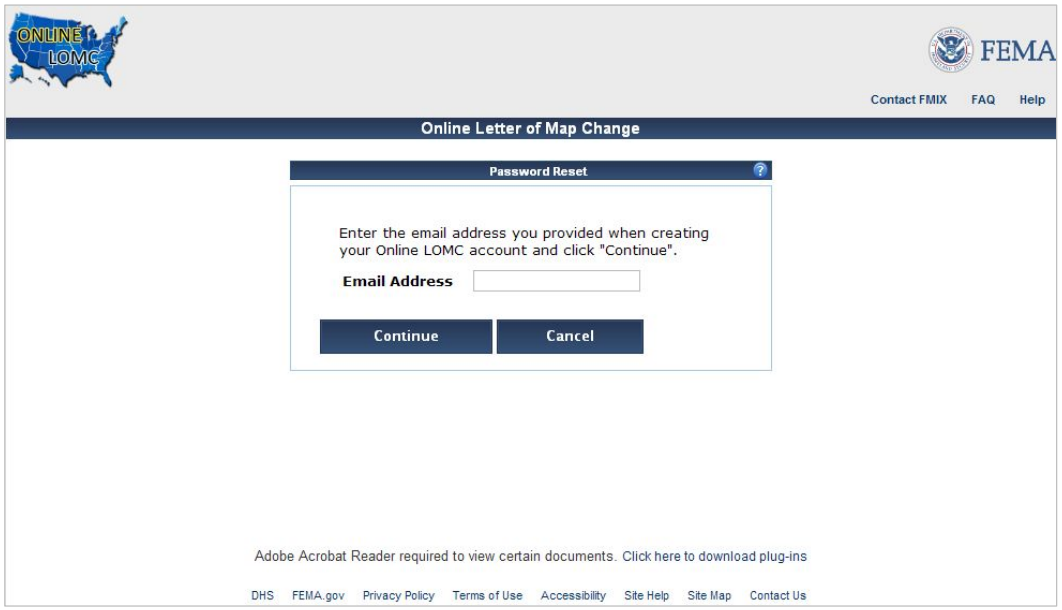
- Click on any question mark symbol for more information
- Opens the Help instructions, jumping you to the right section

Password Reset



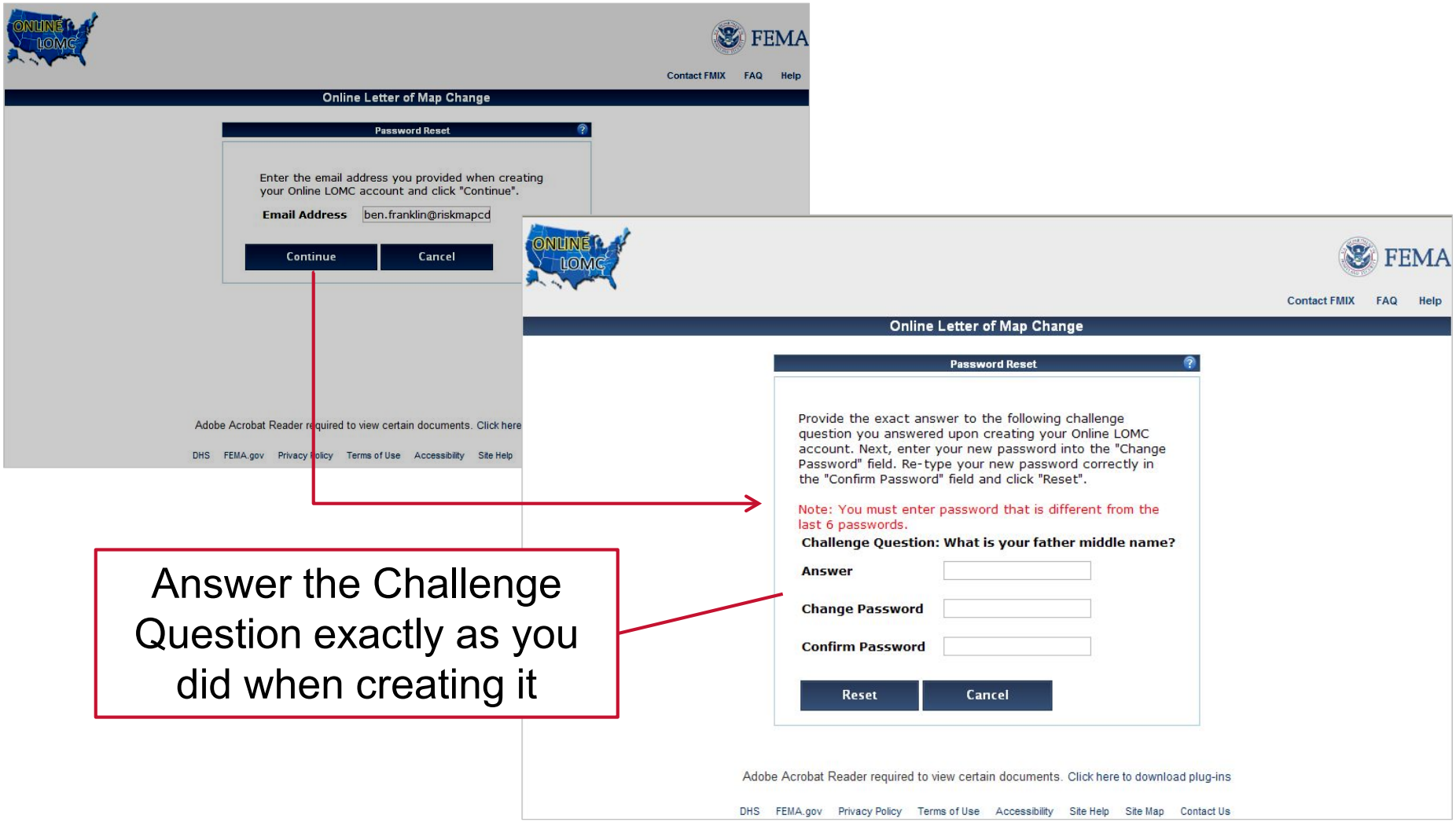
If you forget your password, you may reset it by clicking 'Forgot Password'

Password Reset



- Enter the email address you used to register and click ‘Continue’
- If you don’t remember what email address you registered with, contact the FMIX for Customer Support

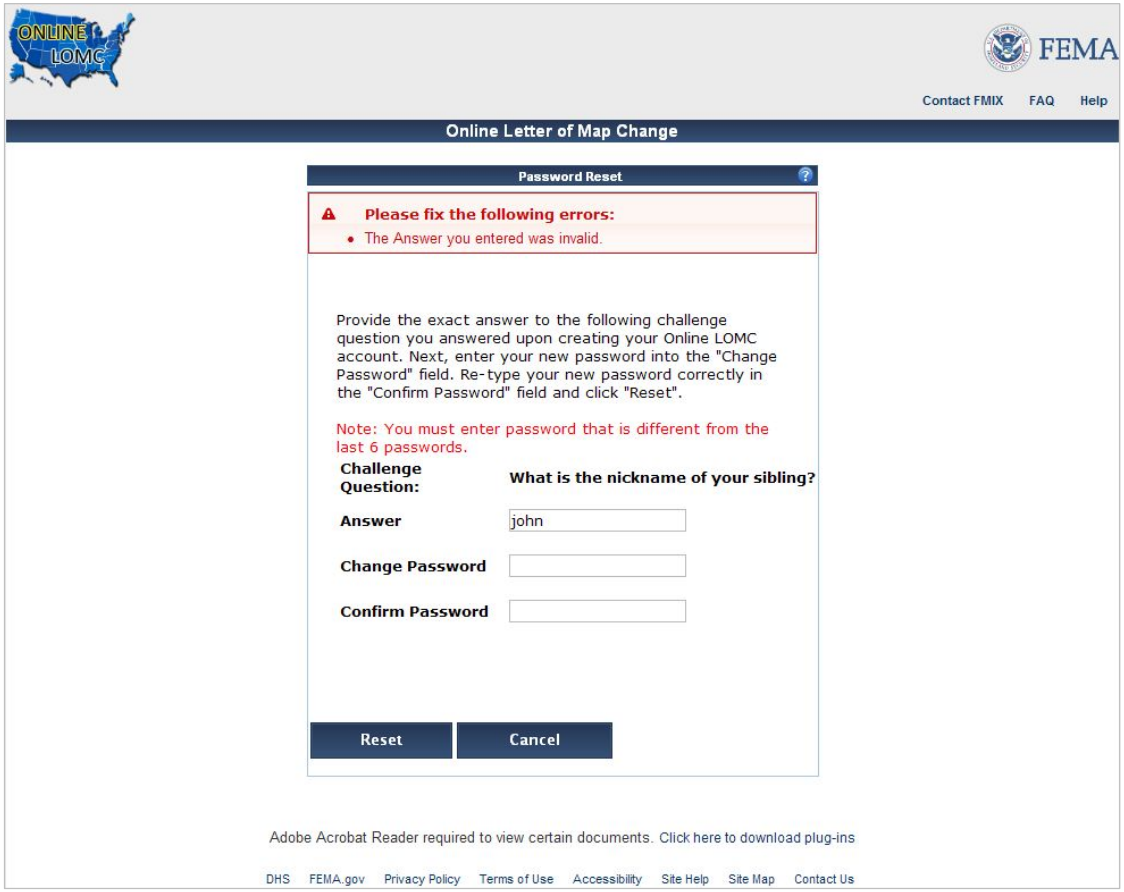
Password Reset



Answer the Challenge Question exactly as you did when creating it

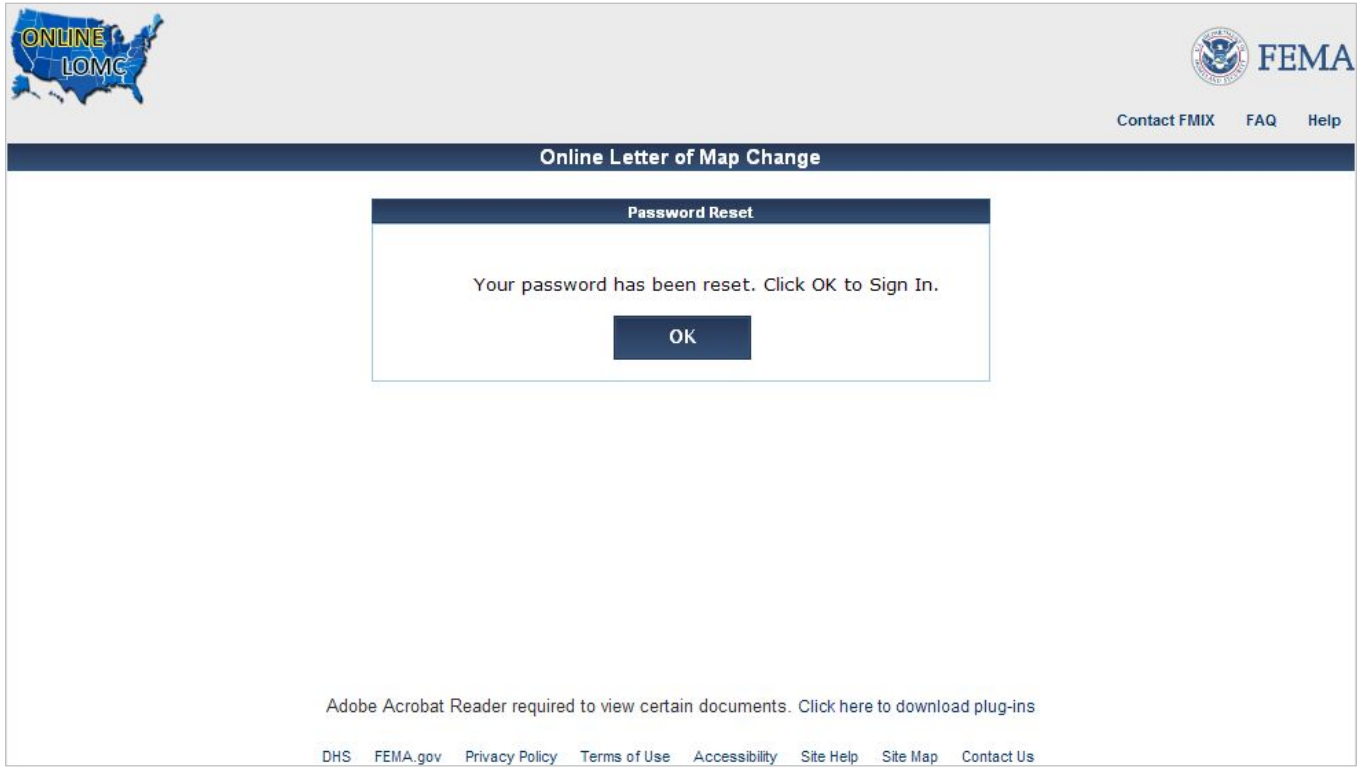
Password Reset Errors

- You must enter a password that is different from the previous 6 passwords used in the Online LOMC
- Password must be at least 8 characters long and have at least 1 number (0123456789) and 1 symbol (! <> @ # $ % ^ & * ( ) _ = + ~)



Password Reset

Once you have registered a new password, return to the Log-in screen and sign in with your updated information



Resources

For more information on flood insurance, LOMCs, and the Online LOMC, please visit these additional resources:

- Online LOMC fema.gov webpage
- Online LOMC FAQ
- Online LOMC Fact Sheet
- Amendments and Revisions webpage
- FloodSmart – Official site of the National Flood Insurance Program

FEMA

How to Print a FIRMette and Download a FIRM Panel

https://msc.fema.gov

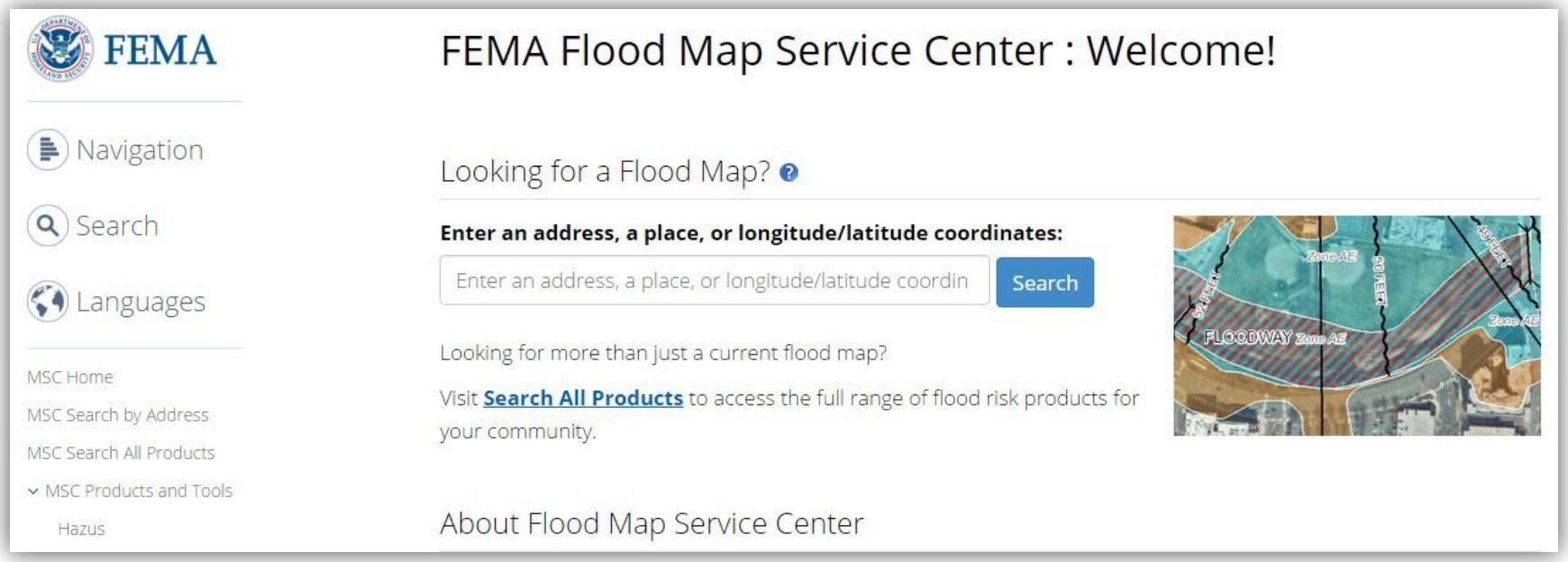
March 2021

RiskMAP
Increasing Resilience Together

Contents

Getting Started

First, navigate to the FEMAFlood Map Service Center (MSC), http://msc.fema.gov.



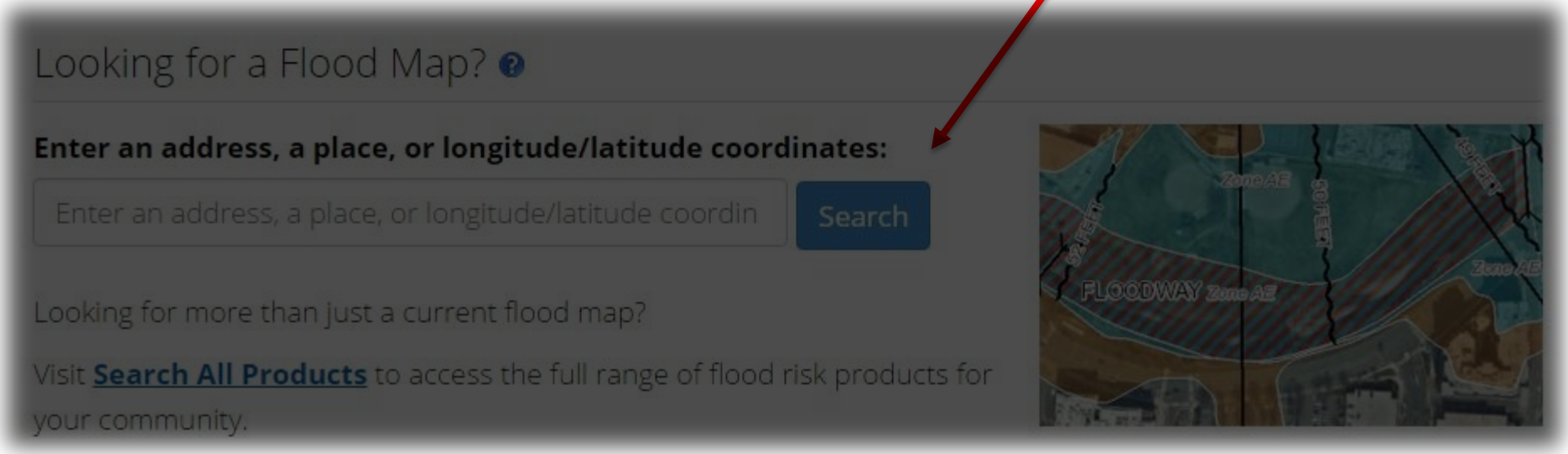
- A Flood Insurance Rate Map (FIRM) is an official flood map used in the National Flood Insurance Program.
- Most FIRMs are divided into FIRM panels. The panels are large (2ft x 3ft) and difficult to print.
- You can create a FIRMette which is an easy to print full-scale section of a FIRM

Step One

Search by Address

To find a flood map for a specific address or landmark, you may type an address in the search bar or use the Address Search option on the left side of the MSC homepage.

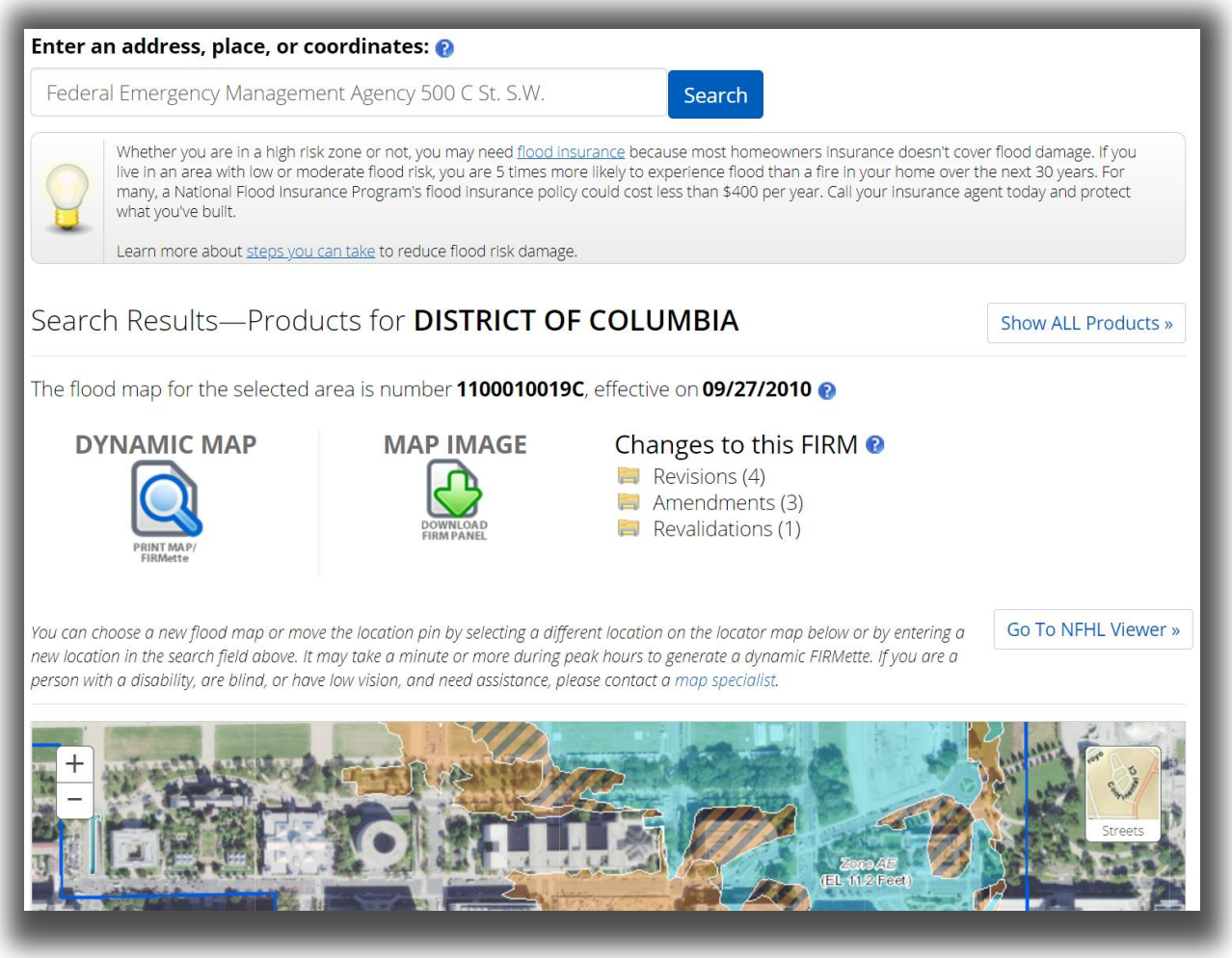
Enter an address or a place of interest and select the “Search” button.



Step Two

Option A - Print a FIRMette

Most search results include 2 options and a map that displays your location and the flood zones for the area*
The first option creates a printable FIRMette from FEMA's dynamic digital flood data.

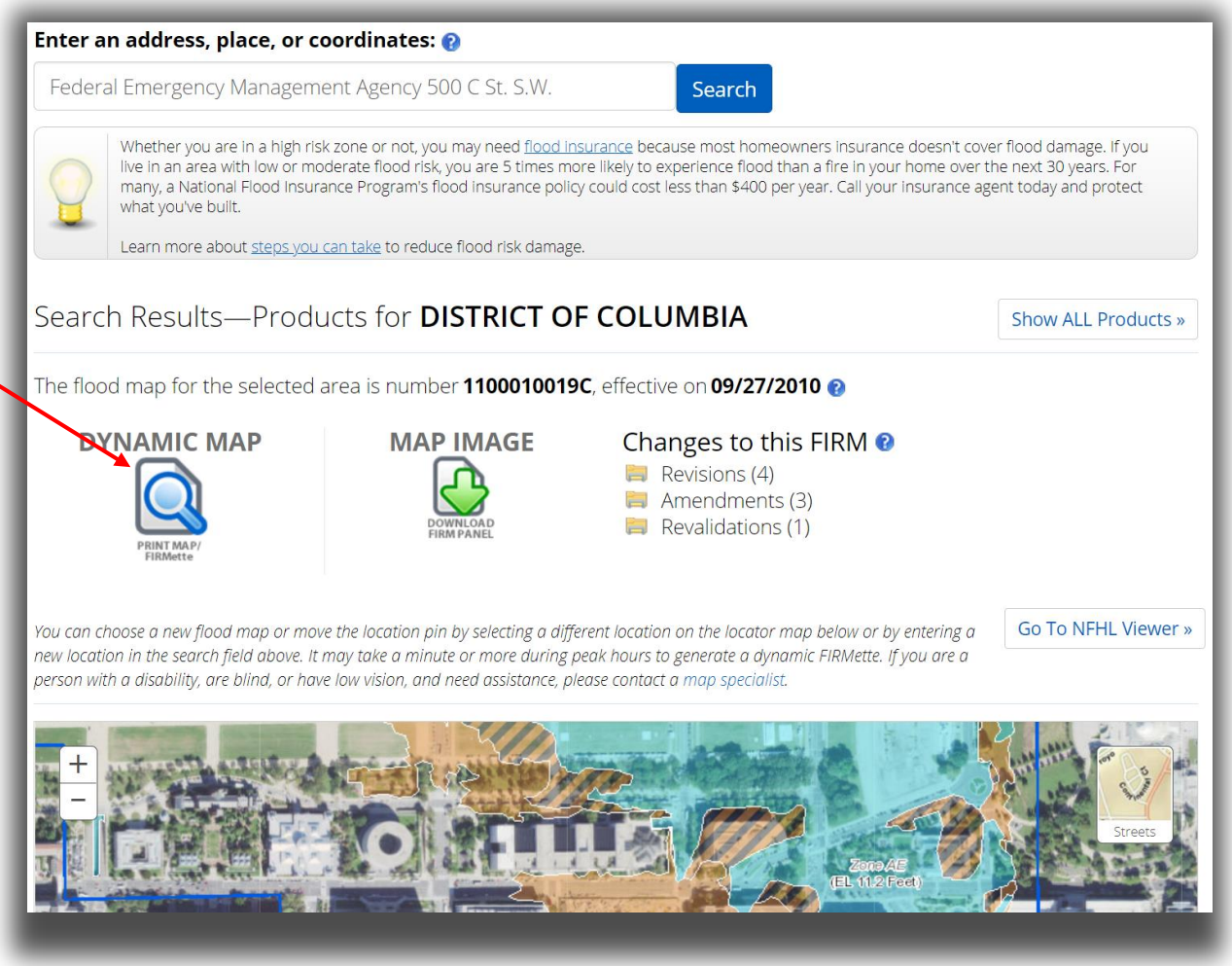


NOTE: If digital data is not available, flood zones will not display, only the FIRM boundaries.

Step Two

Option A - Print a FIRMette

Select “Print Map/FIRMette” This will create a FIRMette in pdf format. This printable map is created dynamically using the current effective FIRM, plus any letters of map revision issued since.

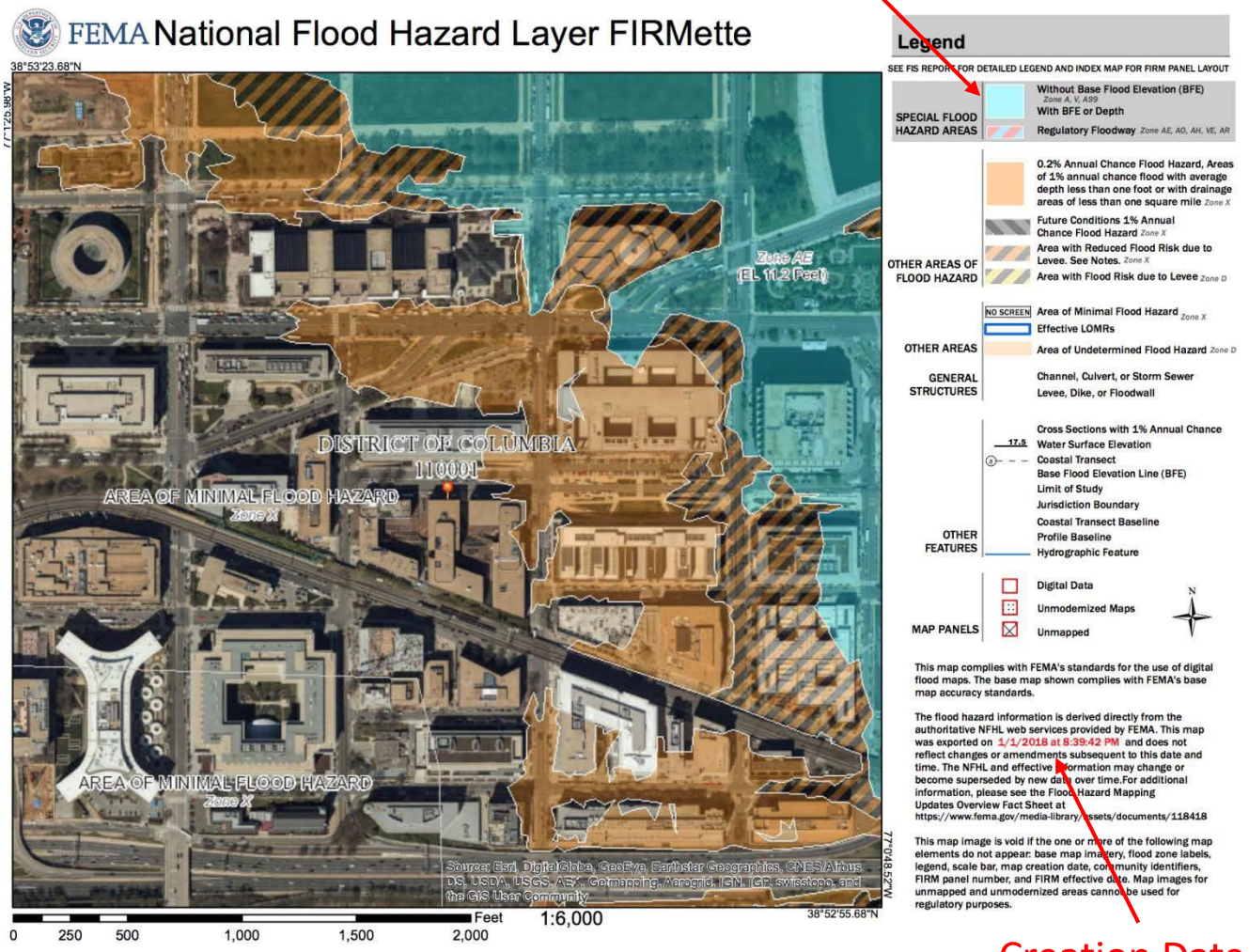


NOTE: If digital data is not available, the available buttons will be slightly different. See the instructions for using FIRMette Web later in this document.

Step Two

Option A - Print a FIRMette

And you're done! After a few moments, the FIRMette will open in a new browser tab and be centered on the approximate location from Address Search. Here's an example FIRMette. Once opened, you can save the documents or use the "Print to PDF" option to print the documents



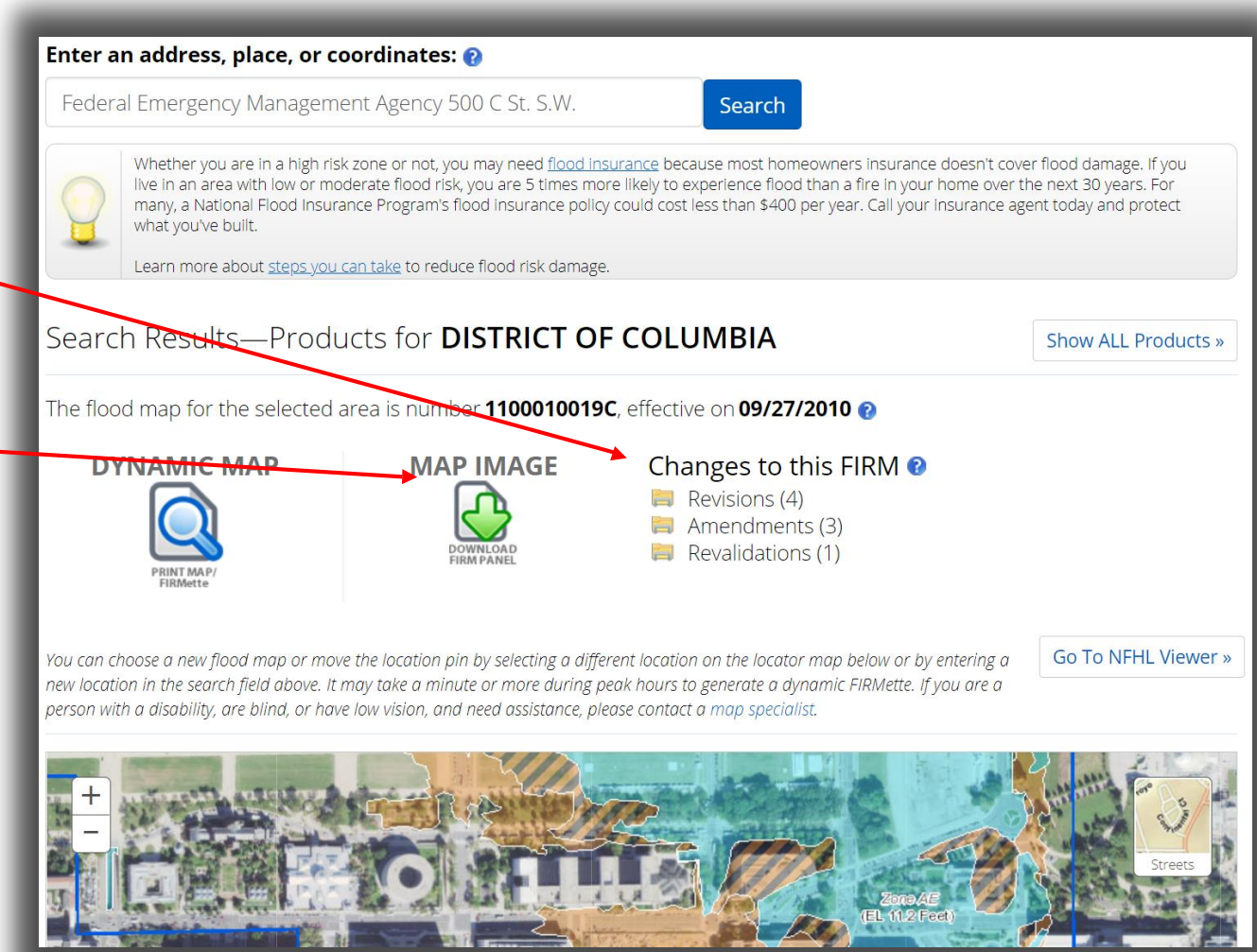
Legend

Creation Date

Step Two

Option B - Download a FIRM Panel

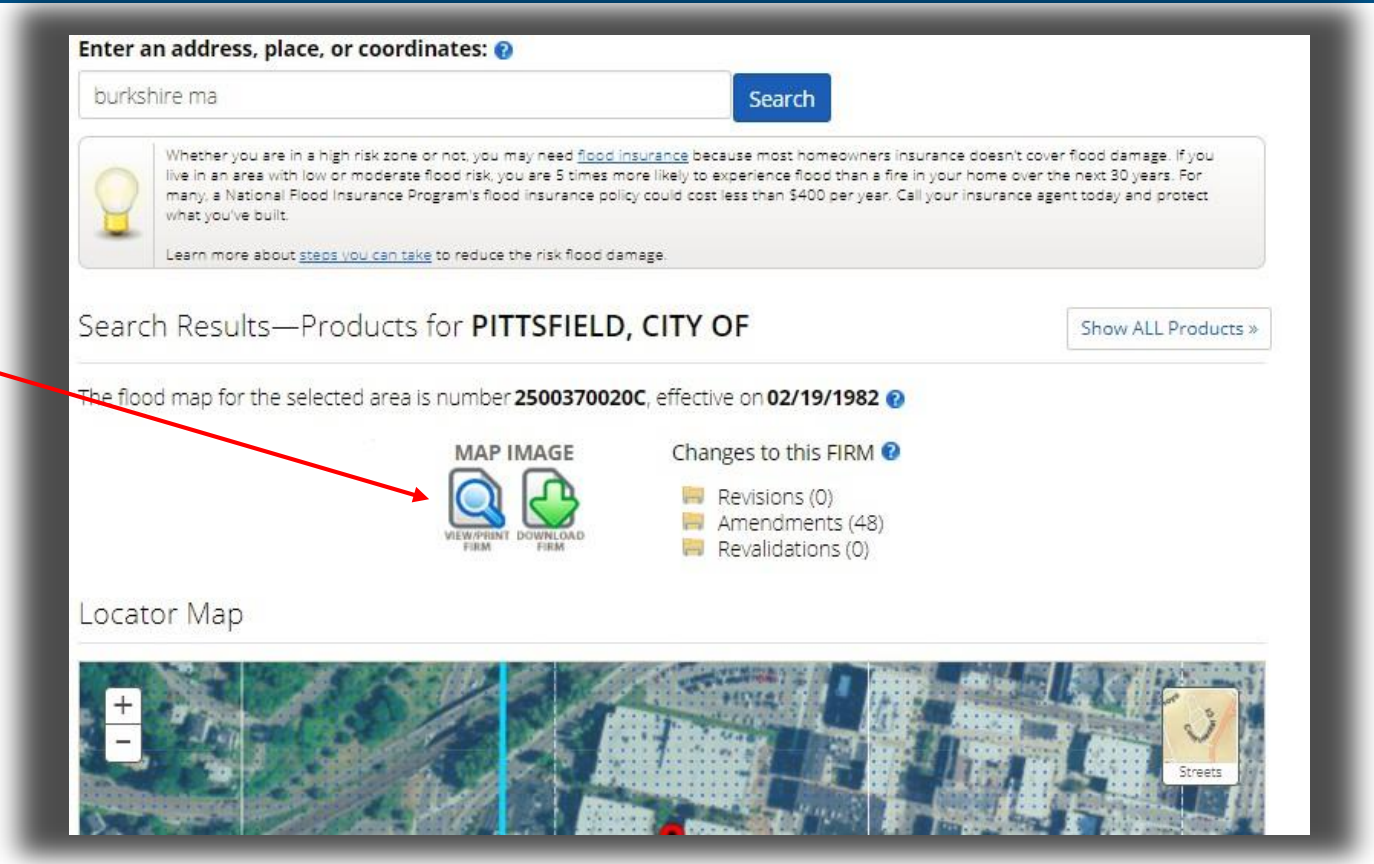
Select “Download FIRM Panel” for a copy of the original full-size FIRM. Since these static map images show the FIRM as it was published on the original effective date, also check if there any updates under “Changes to the FIRM”



Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

If there is no dynamic Digital Data for your location, the result page is slightly different. To create a FIRMette of the current Effective FIRM, select "VIEW/PRINT FIRM" Option



NOTE: Be sure to check if there have been any changes to the FIRM by selecting the Revisions, Amendments, and Revalidations options under "Changes to this FIRM".

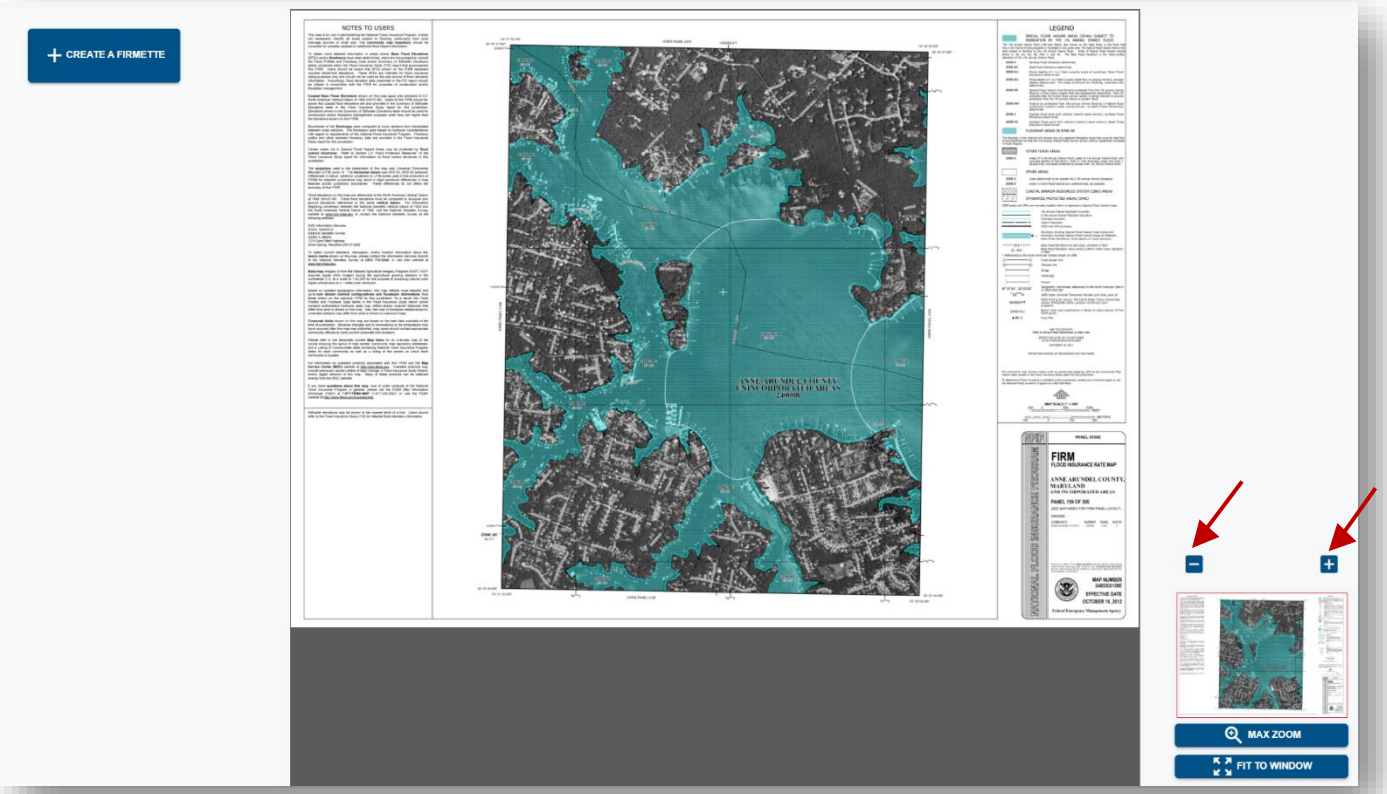
Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

A new window will appear, containing the *FIRMette Web* tool, which will display the selected FIRM panel.

Move around the map to locate the area of interest by clicking the map and dragging in the desired direction.

Use the Zoom in/out functions to zoom in or out on the image.

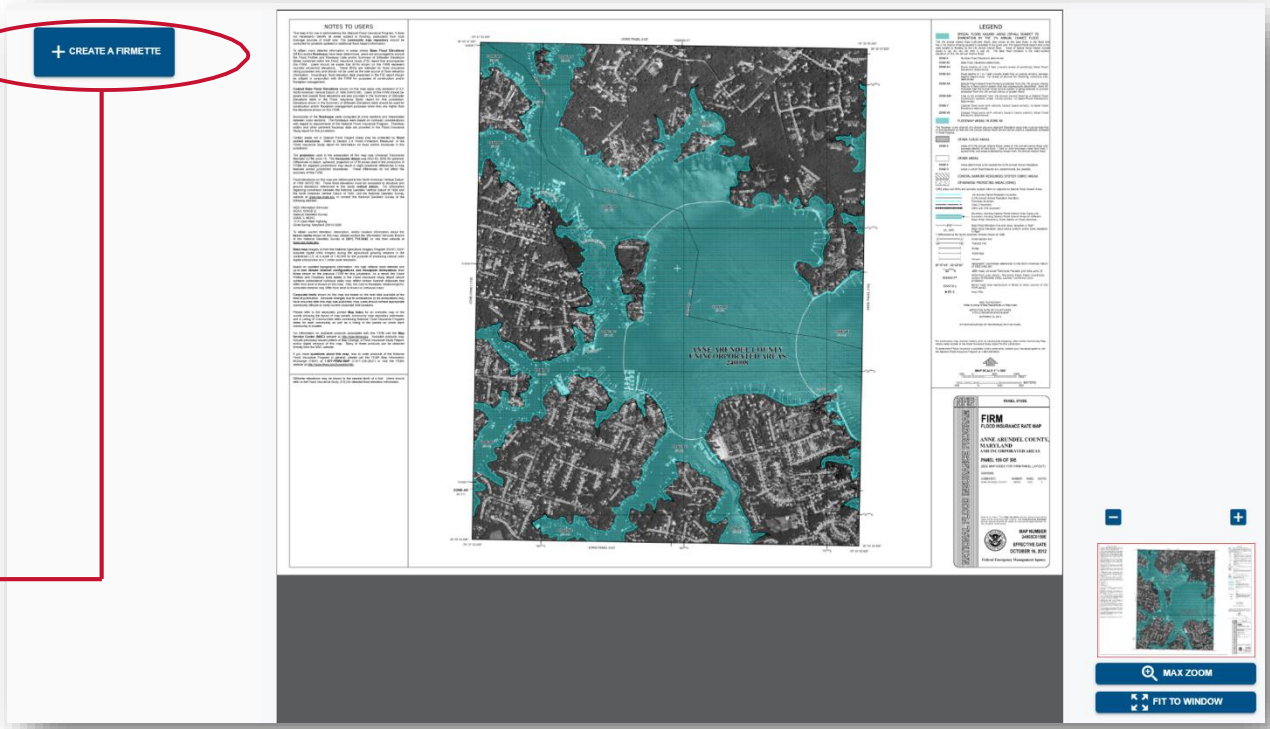


Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

The FIRMette Web tool allows you to generate an official flood map (FIRM) that can be printed on a standard office printer.

Once you have located the area of interest on the FIRM, if you want a print version you can create a FIRMette by selecting the “Create a FIRMette” button.



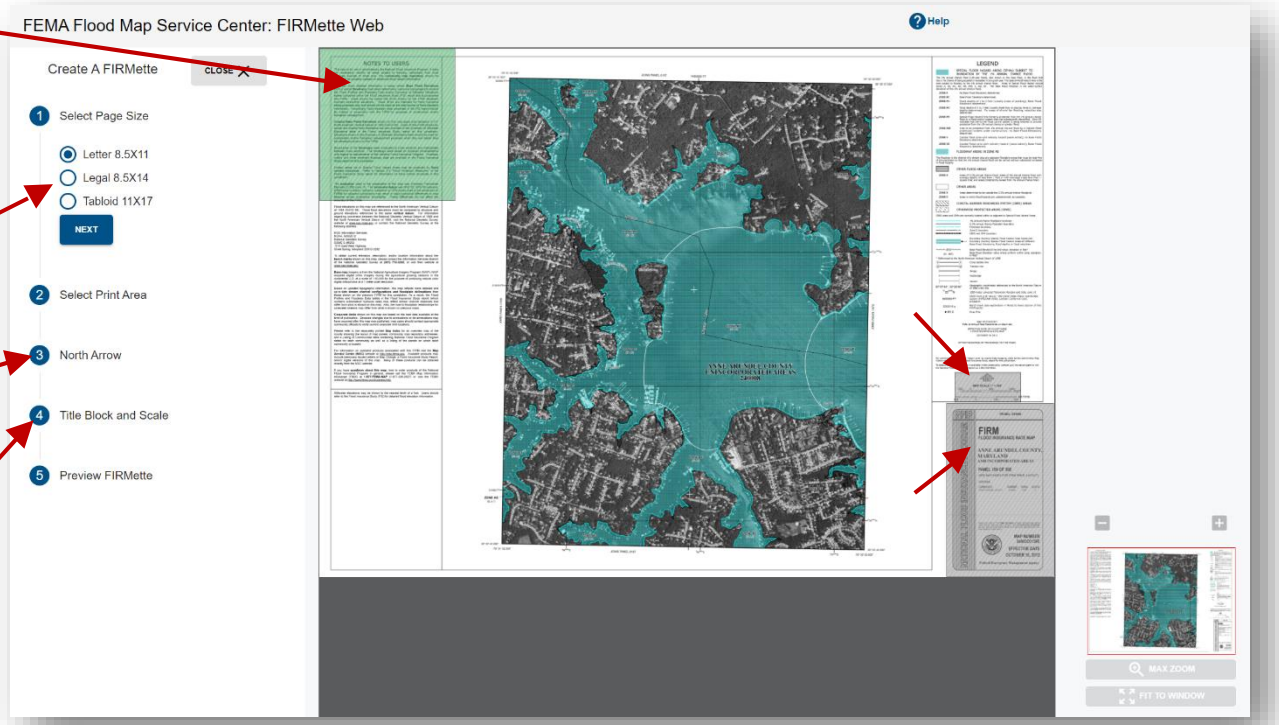
Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

Click, hold, and drag the green box to cover the map area you want in you FIRMette.

Choose your paper size.

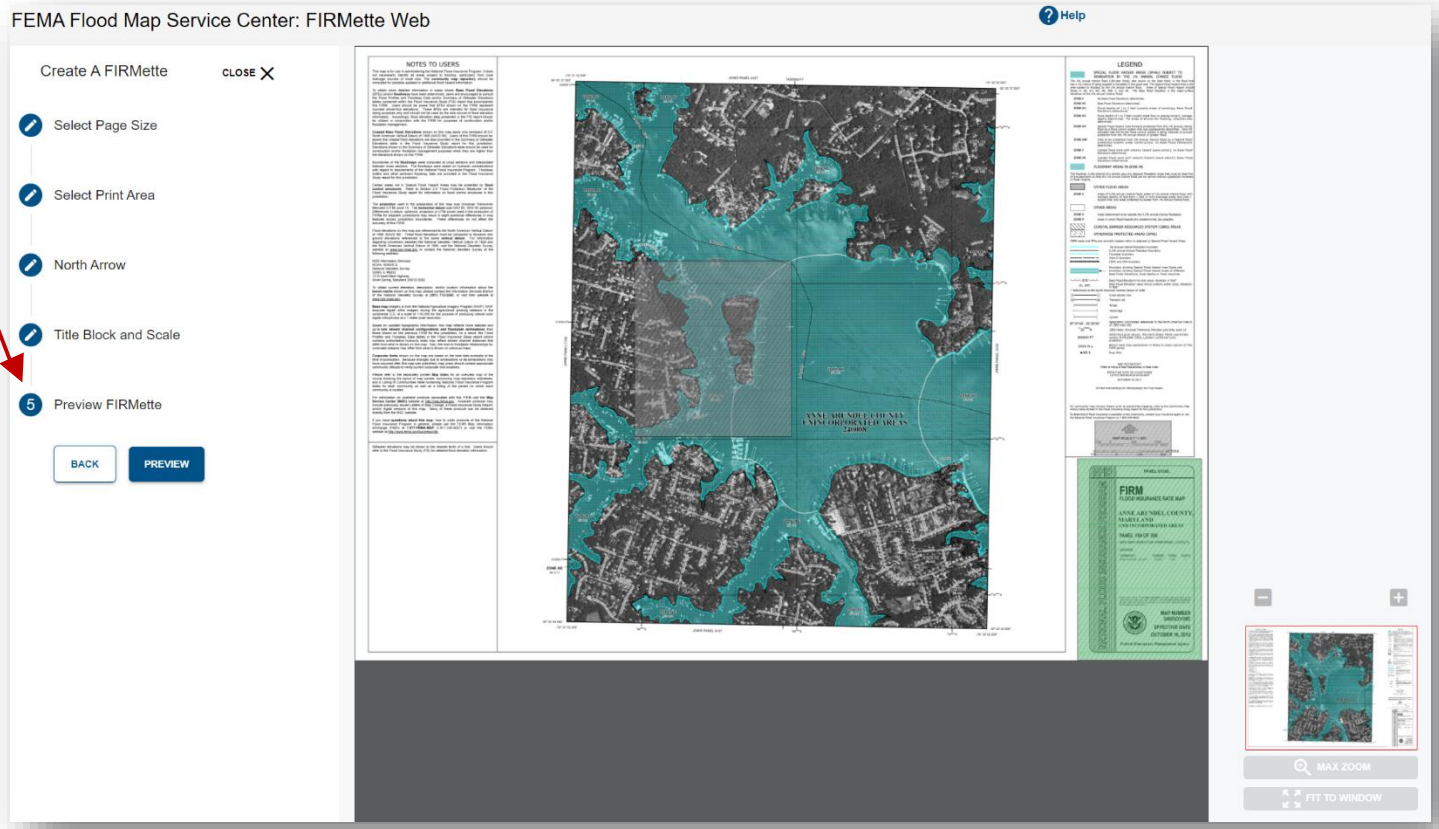
To reposition the title block or scale and north arrow, click the appropriate button and drag the new green layer. These 3 selection boxes will be included on the FIRMette.



Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

When ready click on “Preview” to view your FIRMette.

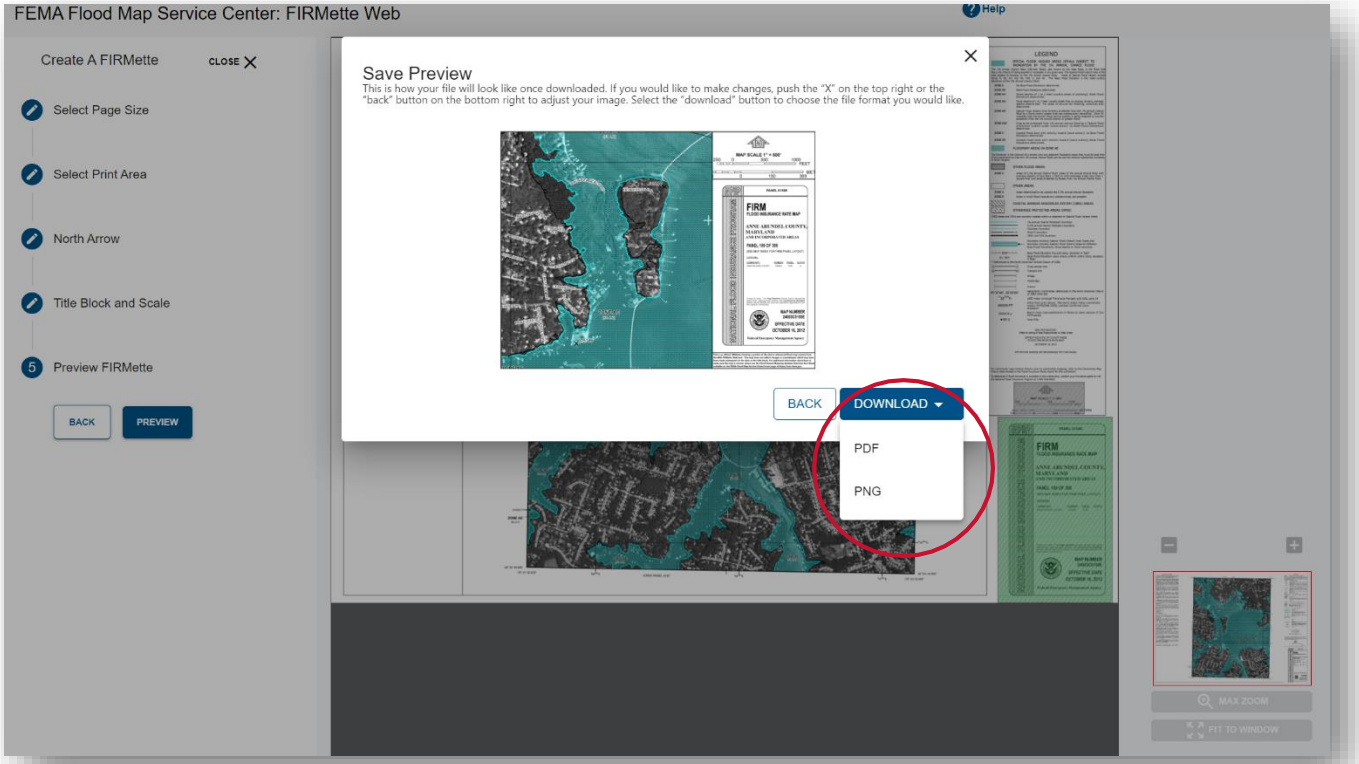


Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

Your FIRMette will appear and can be downloaded and saved to your hard drive as a PDF file or PNG file.

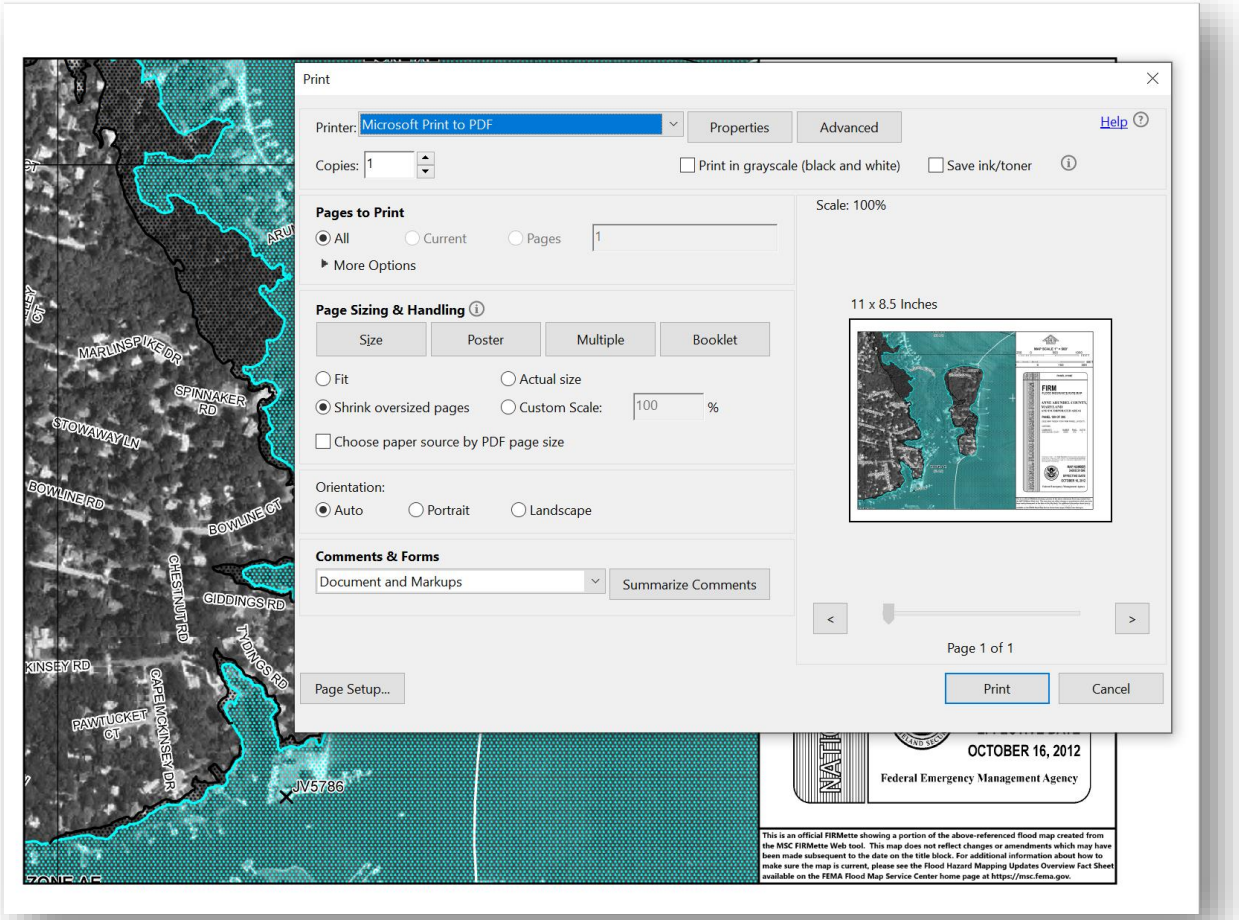
You can also go back and make additional FIRMettes from the same panel.



Areas without Digital Data:

Making FIRMettes in *FIRMette Web*

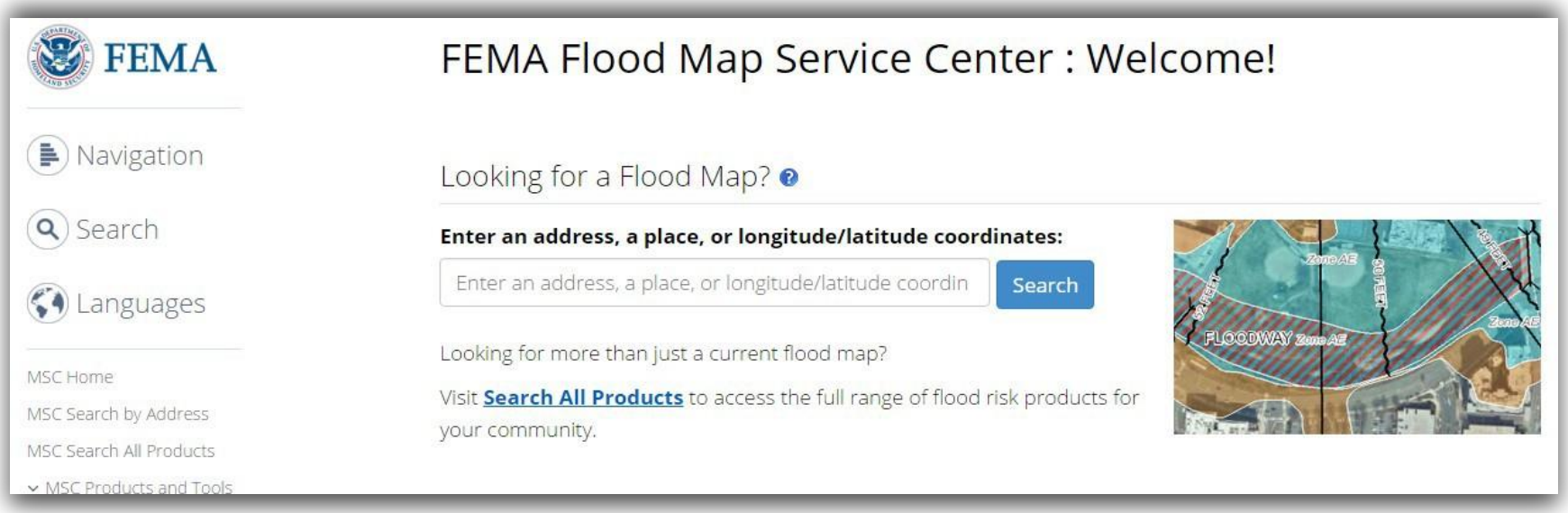
Once you have saved and/or opened your FIRMette in your local image viewer, you can print it out on the appropriate-sized paper corresponding to your earlier selection.



Search All Products

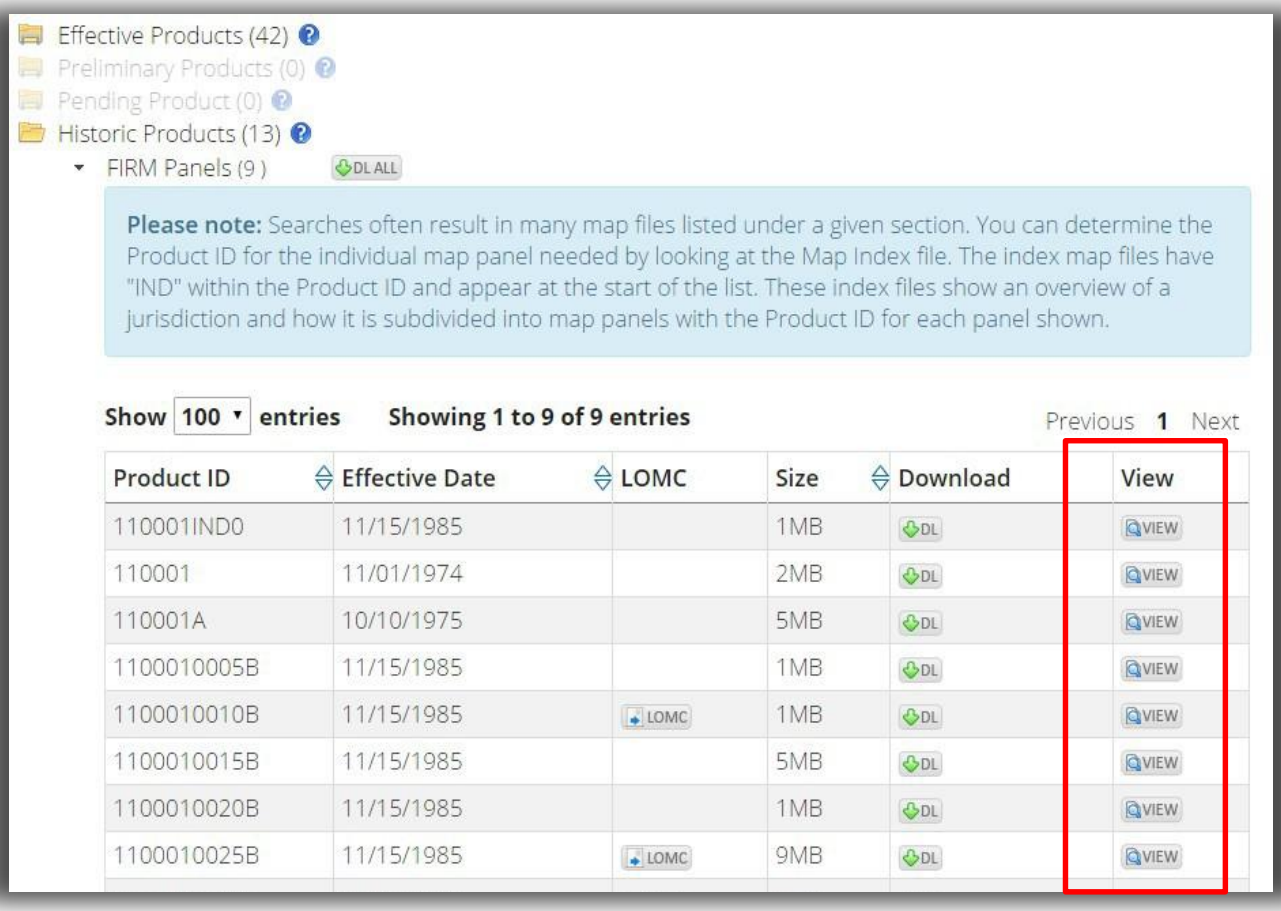
Search by Address is for finding the current effective map for your community. While Search All Products is useful for finding the full range of maps and Flood Risk Products Available for a location.

To search for additional products use the Search All Products option located on the MSC home page, in the left hand navigation of any MSC page, or from your Address Search Results..



Search All Products

Search all Products is a great resource for community officials looking to access Historic FIRM and other mapping products in one complete list for the community. Users can make a FIRMette from any FIRM in FIRMette Web by using the "View" option in the FIRM panel list



NOTE: FIRMette cannot be created for Preliminary FIRM panels since they are not yet official

Troubleshooting

For technical assistance, please use any of the “Help/?” features across any of the FIRM tools. Each of the “Help/?” will provide additional information and resources regarding the tools being used. OR contact a FEMA Map Specialist at:

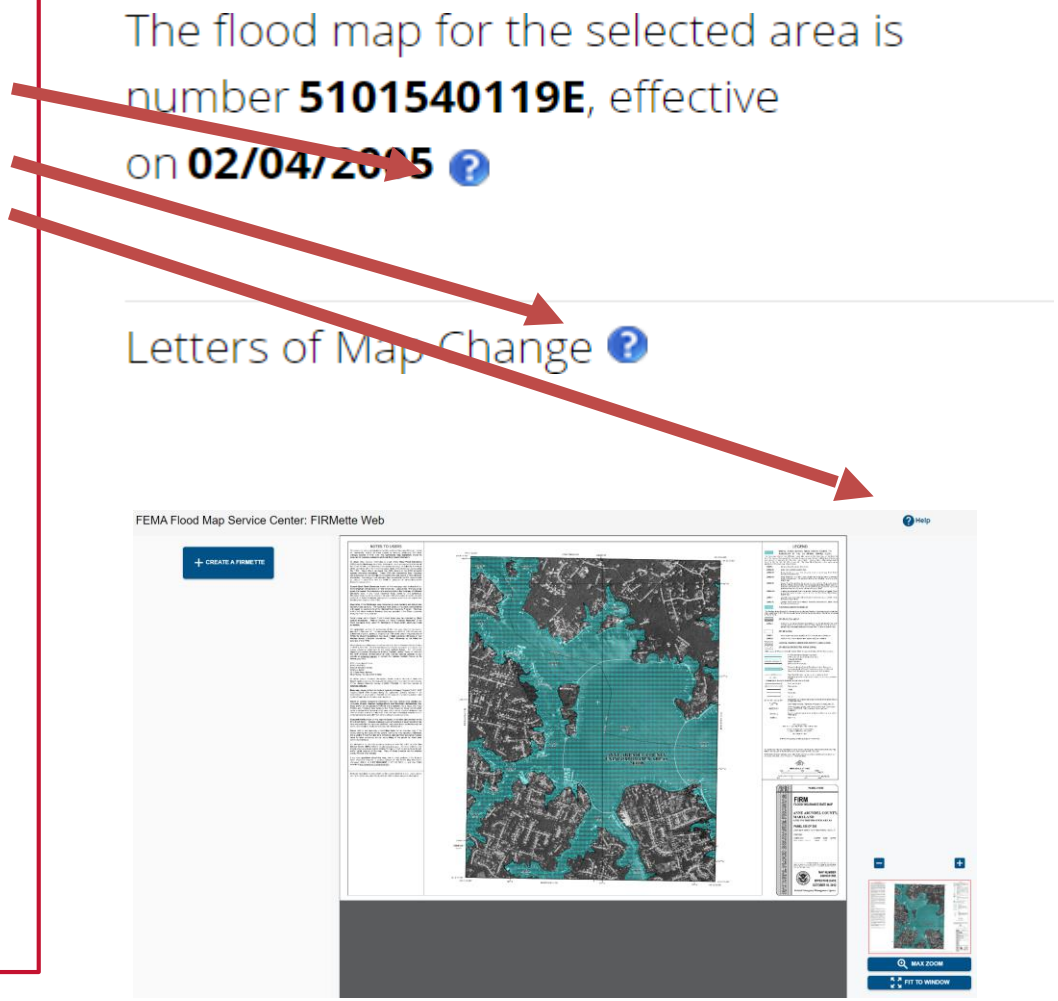
1 (877) FEMA MAP

(1-877-336-2627)

or by email:

FEMA-FMIX@fema.dhs.gov

Visit the MSC FAQ for more general troubleshooting



National Flood Insurance Program

Elevation Certificate

and Instructions

2022 EDITION

FEMA

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

OMB Control No. 1660-0008
Expiration Date: 06/30/2026

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 documenting compliance with National Flood Insurance Program (NFIP) floodplain management ordinances for new or substantially improved structures in designated Special Flood Hazard Areas. This form may also be used as an optional tool for a Letter of Map Amendment (LOMA), Conditional LOMA (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional LOMR-F (CLOMR-F), or for flood insurance rating purposes in any flood zone.

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 of Records Notice* 79 Fed. Reg. 28747 (May 19, 2014) 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 impact the flood insurance premium through the NFIP. Information will only be released as permitted by law.

PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the NFIP. It can be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to inform the proper insurance premium, and to support a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F.

The Elevation Certificate is used to document floodplain management compliance for Post-Flood Insurance Rate Map (FIRM) buildings, which are buildings constructed after publication of the FIRM, located in flood Zones A1–A30, AE, AH, AO, A (with Base Flood Elevation (BFE)), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, and A99. It may also be used to provide elevation information for Pre-FIRM buildings or buildings in any flood zone.

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, CLOMA, LOMR-F, or CLOMR-F request. Lowest Adjacent Grade (LAG) elevations certified by a land surveyor, engineer, or architect, as authorized by state law, will be required if the certificate is used to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request. A LOMA, CLOMA, LOMR-F, or CLOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 application package, whichever is appropriate. If the certificate will only be completed to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request, there is an option to document the certified LAG elevation on the Elevation Form included in the MT-EZ and MT-1 application.

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 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.

The expiration date on the form herein does not apply to certified and completed Elevation Certificates, as a completed Elevation Certificate does not expire, unless there is a physical change to the building that invalidates information in Section A Items A8 or A9, Section C, Section E, or Section H. In addition, this form is intended for the specific building referenced in Section A and is not invalidated by the transfer of building ownership.

Additional guidance can be found in FEMA Publication 467-1, *Floodplain Management Bulletin: Elevation Certificate*.

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

OMB Control No. 1660-0008
Expiration Date: 06/30/2026

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

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 (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number:

_____

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

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84

A6. Attach at least two and when possible four clear photographs (one for each side) of the building (see Form pages 7 and 8).

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) Is there at least one permanent flood opening on two different sides of each enclosed area? ☐ Yes ☐ No ☐ N/A

c) Enter number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade:
Non-engineered flood openings: _____ Engineered flood openings: _____

d) Total net open area of non-engineered flood openings in A8.c: _____ sq. in.

e) Total rated area of engineered flood openings in A8.c (attach documentation – see Instructions): _____ sq. ft.

f) Sum of A8.d and A8.e rated area (if applicable – see Instructions): _____ sq. ft.

A9. For a building with an attached garage:

a) Square footage of attached garage: _____ sq. ft.

b) Is there at least one permanent flood opening on two different sides of the attached garage? ☐ Yes ☐ No ☐ N/A

c) Enter number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade:
Non-engineered flood openings: _____ Engineered flood openings: _____

d) Total net open area of non-engineered flood openings in A9.c: _____ sq. in.

e) Total rated area of engineered flood openings in A9.c (attach documentation – see Instructions): _____ sq. ft.

f) Sum of A9.d and A9.e rated area (if applicable – see Instructions): _____ sq. ft.

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1.a. NFIP Community Name: _____ B1.b. NFIP Community Identification Number: _____

B2. County Name: _____ B3. State: _____ B4. Map/Panel No.: _____ B5. Suffix: _____

B6. FIRM Index Date: _____ B7. FIRM Panel Effective/Revised Date: _____

B8. Flood Zone(s): _____ B9. Base Flood Elevation(s) (BFE) (Zone AO, use Base Flood Depth): _____

B10. Indicate the source of the BFE data or Base Flood Depth entered in Item B9:
☐ FIS ☐ FIRM ☐ Community Determined ☐ Other: _____

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

B13. Is the building located seaward of the Limit of Moderate Wave Action (LiMWA)? ☐ Yes ☐ No

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____

City: _____ State: _____ ZIP Code: _____

FOR INSURANCE COMPANY USE

Policy Number: _____

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, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. 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: _____

Datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☐ No
If Yes, describe the source of the conversion factor in the Section D Comments area.

		Check the measurement used:
a) Top of bottom floor (including basement, crawlspace, or enclosure floor):	_____	☐ feet ☐ meters
b) Top of the next higher floor (see Instructions):	_____	☐ feet ☐ meters
c) Bottom of the lowest horizontal structural member (see Instructions):	_____	☐ feet ☐ meters
d) Attached garage (top of slab):	_____	☐ feet ☐ meters
e) Lowest elevation of Machinery and Equipment (M&E) servicing the building (describe type of M&E and location in Section D Comments area):	_____	☐ feet ☐ meters
f) Lowest Adjacent Grade (LAG) next to building: ☐ Natural ☐ Finished	_____	☐ feet ☐ meters
g) Highest Adjacent Grade (HAG) next to building: ☐ Natural ☐ Finished	_____	☐ feet ☐ meters
h) Finished LAG at lowest elevation of attached deck or stairs, including structural support:	_____	☐ feet ☐ 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 state 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 and describe in the Comments area.

Certifier's Name: _____ License Number: _____

Title: _____

Company Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Signature: _____ Date: _____

Telephone: _____ Ext.: _____ Email: _____

Place Seal Here

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

Comments (including source of conversion factor in C2; type of equipment and location per C2.e; and description of any attachments):

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:	**FOR INSURANCE COMPANY USE**
City: _____ State: _____ ZIP Code: _____	Policy Number: _____ Company NAIC Number: _____

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO, ZONE AR/AO, AND ZONE A (WITHOUT BFE)

For Zones AO, AR/AO, and A (without BFE), complete Items E1–E5. For Items E1–E4, use natural grade, if available. If the Certificate is intended to support a Letter of Map Change request, complete Sections A, B, and C. Check the measurement used. In Puerto Rico only, enter meters.

Building measurements are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction

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

E1. Provide measurements (C.2.a in applicable Building Diagram) for the following and check the appropriate boxes to show whether the measurement is above or below the natural HAG and the 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 (C2.b in applicable Building Diagram) 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 AUTHORIZED REPRESENTATIVE) CERTIFICATION

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

☐ Check here if attachments and describe in the Comments area.

Property Owner or Owner's Authorized Representative Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Signature: _____ Date: _____

Telephone: Ext.: _____ Email: _____

Comments:

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____

City: _____ State: _____ ZIP Code: _____

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Section A, B, C, E, G, or H of this Elevation Certificate. Complete the applicable item(s) and sign below when:

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 state law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2.a. ☐ A local official completed Section E for a building located in Zone A (without a BFE), Zone AO, or Zone AR/AO, or when item E5 is completed for a building located in Zone AO.

G2.b. ☐ A local official completed Section H for insurance purposes.

G3. ☐ In the Comments area of Section G, the local official describes specific corrections to the information in Sections A, B, E and H.

G4. ☐ The following information (Items G5–G11) is provided for community floodplain management purposes.

G5. Permit Number: _____ G6. Date Permit Issued: _____

G7. Date Certificate of Compliance/Occupancy Issued: _____

G8. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G9.a. Elevation of as-built lowest floor (including basement) of the building: _____ ☐ feet ☐ meters Datum: _____

G9.b. Elevation of bottom of as-built lowest horizontal structural member: _____ ☐ feet ☐ meters Datum: _____

G10.a. BFE (or depth in Zone AO) of flooding at the building site: _____ ☐ feet ☐ meters Datum: _____

G10.b. Community's minimum elevation (or depth in Zone AO) requirement for the lowest floor or lowest horizontal structural member: _____ ☐ feet ☐ meters Datum: _____

G11. Variance issued? ☐ Yes ☐ No If yes, attach documentation and describe in the Comments area.

The local official who provides information in Section G must sign here. *I have completed the information in Section G and certify that it is correct to the best of my knowledge. If applicable, I have also provided specific corrections in the Comments area of this section.*

Local Official's Name: _____ Title: _____

NFIP Community Name: _____

Telephone: _____ Ext.: _____ Email: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Signature: _____ Date: _____

Comments (including type of equipment and location, per C2.e; description of any attachments; and corrections to specific information in Sections A, B, D, E, or H):

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:	**FOR INSURANCE COMPANY USE**
City: _____ State: _____ ZIP Code: _____	Policy Number: _____ Company NAIC Number: _____

SECTION H – BUILDING'S FIRST FLOOR HEIGHT INFORMATION FOR ALL ZONES (SURVEY NOT REQUIRED) (FOR INSURANCE PURPOSES ONLY)

The property owner, owner's authorized representative, or local floodplain management official may complete Section H for all flood zones to determine the building's first floor height for insurance purposes. Sections A, B, and I must also be completed. Enter heights to the nearest tenth of a foot (nearest tenth of a meter in Puerto Rico). ***Reference the Foundation Type Diagrams (at the end of Section H Instructions) and the appropriate Building Diagrams (at the end of Section I Instructions) to complete this section.***

H1. Provide the height of the top of the floor (as indicated in Foundation Type Diagrams) above the Lowest Adjacent Grade (LAG):

a) **For Building Diagrams 1A, 1B, 3, and 5–9.** Top of bottom floor (include above-grade floors only for buildings with subgrade crawlspaces or enclosure floors) is: _____ ☐ feet ☐ meters ☐ above the LAG

b) **For Building Diagrams 2A, 2B, 4, and 6–9.** Top of next higher floor (i.e., the floor above basement, crawlspace, or enclosure floor) is: _____ ☐ feet ☐ meters ☐ above the LAG

H2. Is **all** Machinery and Equipment servicing the building (as listed in Item H2 instructions) elevated to or above the floor indicated by the H2 arrow (shown in the Foundation Type Diagrams at end of Section H instructions) for the appropriate Building Diagram?

☐ Yes ☐ No

SECTION I – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and H must sign here. *The statements in Sections A, B, and H are correct to the best of my knowledge.* **Note:** If the local floodplain management official completed Section H, they should indicate in Item G2.b and sign Section G.

☐ Check here if attachments are provided (including required photos) and describe each attachment in the Comments area.

Property Owner or Owner's Authorized Representative Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Signature: _____ Date: _____

Telephone: _____ Ext.: _____ Email: _____

Comments:

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

BUILDING PHOTOGRAPHS

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:

City: _____ State: _____ ZIP Code: _____

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

Instructions: Insert below at least two and when possible four photographs showing each side of the building (for example, may only be able to take front and back pictures of townhouses/rowhouses). Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." Photographs must show the foundation. When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.

Photo One

Photo One Caption:

Clear Photo One

Photo Two

Photo Two Caption:

Clear Photo Two

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

BUILDING PHOTOGRAPHS

Continuation Page

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:

City: _____ State: _____ ZIP Code: _____

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

Insert the third and fourth photographs below. Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.

Photo Three

Photo Three Caption:

Clear Photo Three

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 state law to certify elevation information when elevation information is required or used for Zones A1–A30, AE, AH, AO, A (with Base Flood Elevation (BFE)), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, or A99.

Community officials who are authorized by law or ordinance to provide floodplain management information (herein referred to as "local floodplain management official") may also complete this form. For Zones AO, AR/AO, and A (without BFE), a local floodplain management official, a property owner, or an owner's authorized representative may provide floodplain management compliance information on this certificate in Section E, unless the elevations are intended for use in supporting a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA, CLOMA, LOMR-F, or CLOMR-F.

The property owner, the owner's authorized representative, or local floodplain management official 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.

For insurance purposes only, a local floodplain management official, a property owner, or an owner's authorized representative may provide First Floor Height details in Section H for any zone.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

Note: Section C can be used for insurance and compliance in any zone; however, Section E can be used only for compliance in Zone AO and Zone A.

SECTION A – PROPERTY INFORMATION

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 or property description (e.g., lot and block numbers or legal description), and/or tax parcel number. 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. For properties with multiple buildings, include a description for the specific building.

A map may be attached to this certificate to show the location of the building on the property. A tax map, Flood Insurance Rate 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., 39.504322°, −110.758522°) or degrees, minutes, seconds (e.g., 39° 30' 15.56", −110° 45' 30.68") format. If decimal degrees are used, provide coordinates to at least six decimal places or better. When using degrees, minutes, seconds, provide seconds to at least two decimal places or better. Provide the datum of the latitude and longitude coordinates (FEMA prefers the use of NAD 1983). Indicate the method or source used to determine the latitude and longitude in the Comments area of the appropriate section. When the latitude and longitude are provided by a land surveyor, check the "Yes" box in Section D.

Item A6. The certifier must provide at least two and when possible four photographs showing each side of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and Building Diagram number provided in Item A7. To the extent possible, these photographs should show the entire building including foundation. 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. Additional photographs may be requested by local floodplain management officials or for insurance purposes to show additional detail regarding the building characteristics or features.

Item A7. Select the Building Diagram (shown on pages 17-19) 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 on pages 18-19. Diagram 2A, 2B, 4, or 9 should be used for a building constructed with a crawlspace floor that is below the exterior grade on all sides. If there is no crawlspace or enclosure, enter "N/A" for Items A8.a-f.

Item A8.b. Indicate if there is at least one permanent flood opening within 1.0 foot of the adjacent grade on at least two exterior walls of each enclosed area identified in A8.a. 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 crawlspace or enclosure(s) have no permanent flood openings, or if none of the openings are within 1.0 foot above adjacent grade, enter "0" (zero) in Item A8.c-f. If there is no crawlspace or enclosure, enter "N/A".

SECTION A – PROPERTY INFORMATION *(Continued)*

Item A8.c. Enter the total number of permanent non-engineered and/or engineered 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. If the interior grade elevation is used, note this in the Comments area of Section D.

Item A8.d. Enter the total measured net open area of permanent non-engineered flood openings indicated in A8.c in square inches, excluding any bars, louvers, or other covers of the permanent flood openings. Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. If the net open area cannot be measured, provide in the Comments area of the appropriate section the size of the flood openings without consideration of any covers and indicate the type of cover that exists in the flood openings.

Item A8.e. Enter the total rated area of the permanent engineered flood openings indicated in A8.c, in square feet. Attach a copy of the Individual Engineered Flood Openings Certification for a specific building or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) for all engineered openings, and indicate the manufacturer's name and model number in the Comments area of the appropriate section, if applicable. Flood openings cannot be considered engineered flood openings without documentation. If no documentation is available/ provided, enter the net open (unobstructed) area of the flood openings in A8.d instead.

Item A8.f. Complete only if permanent engineered and permanent non-engineered flood openings are both present. Enter the sum of A8.d (net open area of all non-engineered openings) and A8.e (total rated area of all engineered openings). Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. For example, a non-engineered opening with 140 sq. in. of net open area (i.e., rated for 140 sq. ft. of enclosure area), combined with two (2) engineered openings rated for 200 sq. ft. each, would yield 140 + 400 = 540 sq. ft. rated area. If either A8.d or A8.e is “0”, then enter “N/A” for A8.f.

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. If there is no attached garage, enter "N/A" for items A9.a-f.

Item A9.b. Indicate if there is at least one permanent flood opening within 1.0 foot of the adjacent grade on at least two exterior walls of the attached garage identified in A9.a. If the attached garage has no permanent flood openings, or if none of the openings are within 1.0 foot above adjacent grade, enter “0” (zero) in Items A9.c-f. If there is no attached garage, enter “N/A”.

Item A9.c. Enter the total number of permanent non-engineered and/or engineered 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. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. If the interior grade elevation is used, note this in the Comments area of Section D.

Item A9.d. Enter the total measured net open area of permanent non-engineered flood openings indicated in A9.c in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A9.d. Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. If the net open area cannot be measured, provide in the Comments area of the appropriate section the size of the flood openings without consideration of any covers and indicate the type of cover that exists in the flood openings.

Item A9.e. Enter the total rated area of the permanent engineered flood openings indicated in A9.c in square feet. Attach a copy of the Individual Engineered Flood Openings Certification for a specific building or an Evaluation Report issued by the ICC ES for all engineered openings, and indicate the manufacturer's name and model number in the Comments area of the appropriate section, if applicable. Flood openings cannot be considered engineered flood openings without documentation. If no documentation is available/provided, enter the net open (unobstructed) area of the flood openings in A9.d instead.

Item A9.f. Complete only if permanent engineered and permanent non-engineered flood openings are both present. Enter the sum of A9.d (net open area of all non-engineered openings) and A9.e (total rated area of all engineered openings). Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. For example, a non-engineered opening with 140 sq. in. of net open area (i.e., rated for 140 sq. ft. of enclosure area), combined with two (2) engineered openings rated for 200 sq. ft. each, would yield 140 + 400 = 540 sq. ft. rated area. If either A9.d or A9.e is “0”, then enter “N/A” for A9.f.

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Elevation Certificate using the Flood Insurance Study (FIS) and FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIS and the FIRM panel that includes the building's location. Information about the current FIS and FIRM is available from FEMA by visiting msc.fema.gov or contacting the local floodplain management official. If a Letter of Map Amendment (LOMA), Letter of Map Revision Based on Fill (LOMR-F), or Letter of Map Revision (LOMR) 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 was mapped in one community but is now in another community due to annexation or dissolution, enter the community name and six-digit Community Identification Number of the community in which the building is now located in Items B1.a and B1.b; the name of the county or new county, if necessary, in Item B2; and the FIRM index date for the community identified in B1.a, 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.

Note: Indicate in the Comments area of Section D if using information based on best available data, such as base-level engineering or advisory flood hazard data (contact the local floodplain management official to confirm).

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION *(Continued)*

Items B1.a–b NFIP Community Name and Community Identification Number. Enter the complete name of the community in which the building is located in B1.a, and the associated six-digit Community Identification Number in B1.b. For an unincorporated area of a county, enter the county name and “unincorporated area”, and the six-digit number of the county. For a newly incorporated community, use the name and six-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 which 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 website at **www.fema.gov/national-flood-insurance-program-community-status-book**.

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 the county name. For an independent city, enter "independent city."

Item B3. State. Enter the two-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 four-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 effective date shown on the current FIRM panel. The current FIRM panel effective date can be determined by visiting **msc.fema.gov** or contacting the local floodplain management official. If the area where the building is located was revised by a LOMR, include the LOMR effective date and the LOMR case number in the comments area of Section D.

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 (SFHAs). Each flood zone is defined in the legend of the FIRM panel on which it appears. If the area where the building is located was revised by a LOMA, CLOMA, LOMR-F, or CLOMR-F, include the flood zone shown on the LOMA, CLOMA, LOMR-F, or CLOMR-F, and add the effective date and case number in the comments area of Section D.

Item B9. Base Flood Elevation(s) (BFE). Using the appropriate Flood Insurance Study (FIS) Profile, FIS Data Table (e.g. Transect, Floodway, etc.), or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico). If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9.

BFEs are shown in the FIS or on a FIRM for Zones A1–A30, AE, AH, V1–V30, VE, AR, AR/A, AR/AE, AR/A1–A30, and AR/AH; base flood depths are shown for Zones AO and AR/AO. Use the AR BFE (or base flood depth) if the building is located in any of these zones: AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO.

In A or V zones where BFEs are not provided in the FIS or 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 (e.g., Base Level Engineering) for the building site. For subdivisions and other developments of more than 50 lots or 5 acres in Zone A, 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. The BFE entered in Item B9 must be based on hydrologic and hydraulic analyses. In an A Zone where BFEs are not obtained from another source, enter N/A in Item B9 and complete Section E.

Item B10. Indicate the source of the BFE or base flood depth that you entered in Item B9. If the BFE is from a source other than the FIS, FIRM, or community, include the name of the study, the agency or company that produced it, and the date when the study was completed. Visit msc.fema.gov or contact the local floodplain management official to access the current FIS and FIRM.

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. CBRS areas and OPAs are no longer shown on the FIRM; please use the maps available at **www.fws.gov/cbra/maps/index.html** to complete Item B12. 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 website at **www.fema.gov/national-flood-insurance-program/coastal-barrier-resources-system**.

Item B13. Indicate whether the building is located seaward of the Limit of Moderate Wave Action (LiMWA). If the LiMWA is not shown on the FIRM, check the “No” box. Information about the LiMWA and other coastal flood zones may be obtained on the FEMA website at **www.fema.gov/flood-maps/coastal/insurance-rate-maps**.

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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 A99. If the Certificate is being completed to demonstrate compliance with local floodplain management requirements, contact the local floodplain management official to find out any additional requirements. Section C may also be completed for insurance purposes to determine the building's First Floor Height in any flood zone (including Zones AO, AR/AO, B, C, X and D). In addition, complete Section C if this certificate is being used to support a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F.

To ensure that all required elevations are obtained, it may be necessary to physically enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or Machinery and Equipment (M&E)).

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED) *(Continued)*

Land 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 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 management official 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 three cases, use the Comments area of Section D to provide the elevation and a brief description of how the elevation was obtained.

Note: If any item does not apply to the building, enter "N/A" for not applicable.

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 two 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 M&E such as furnaces, 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 Online 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.

Note: Enter elevations in Items C2.a–h to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico); if data is surveyed to the nearest hundredth, round to the nearest tenth.

Item C2.a. Enter the elevation measured at the top of the bottom floor (excluding the attached garage) indicated by the selected Building Diagram (Item A7). For buildings elevated on a crawlspace, Building Diagrams 8 and 9, enter the lowest elevation of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents).

Item C2.b. For Building Diagrams 2A through 9 in any flood zone, including Zones B, C, X, and D, enter the elevation measured at the top of the next higher floor (excluding the attached garage) indicated by the selected Building Diagram (Item A7). For buildings requiring more than two floors or levels to be surveyed, such as those with multiple floors or multi-level enclosures, enter the additional surveyed elevations and floor descriptions in the Section D Comments, and clarify which floors are entered as Item C2.a and C2.b.

Item C2.c. For floodplain management compliance, this elevation is required for all Building Diagrams 5 and 6 in V Zones in areas seaward of the LiMWA, and in other areas regulated for coastal flooding hazards. Enter the elevation measured at the bottom of the lowest horizontal structural member of the floor indicated by the selected Building Diagram (Item A7) or the figure below. This elevation can be entered for Building Diagrams 5 and 6 in any flood zone, including Zones B, C, X, and D. For Building Diagrams other than 5 and 6 (if applicable), enter the C2.c elevation as indicated in the figure below. *If this item does not apply to the building, enter "N/A" for not applicable.*

Item C2.d. If there is an attached garage, enter the lowest elevation for top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the Building Diagrams.)

Item C2.e. Enter the lowest platform, floor, or ground elevation supporting the lowest electrical, heating, ventilation, plumbing, and air conditioning M&E and other utilities servicing the building, which may be located in an attached garage or enclosure or on an open utility platform. Note that elevations for the M&E items are required regardless of their location. Local floodplain management officials are required to ensure that ***all*** new M&E servicing the building are protected from flooding. Thus, local officials may require that elevation information for all M&E, including ductwork, be documented on the Elevation Certificate. If the M&E is mounted to a wall, pile, etc., enter the platform elevation of the M&E. Indicate the lowest M&E type and its general location (e.g., on floor inside garage, on platform affixed to exterior wall) in the Comments area of Section D or Section G, as appropriate.

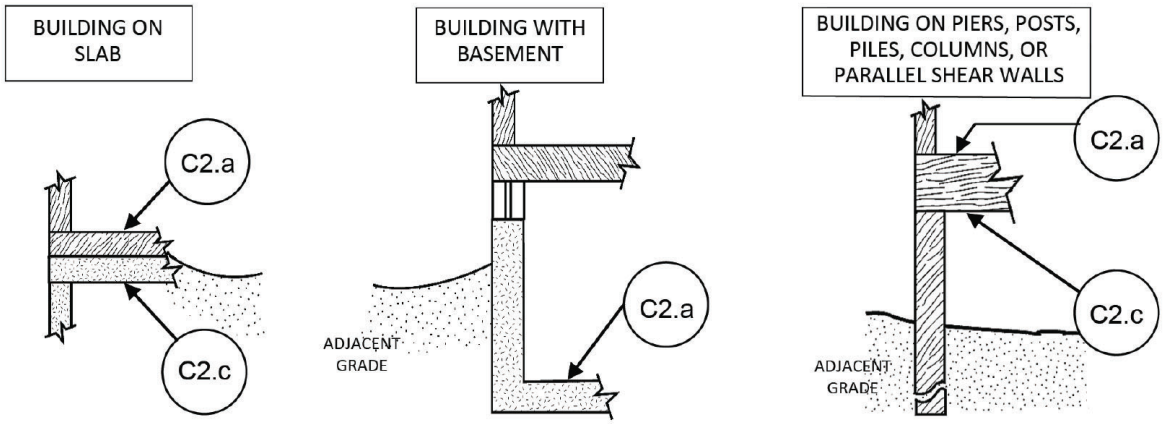
Note: For more guidance on floodplain management compliance for utilities, including M&E, refer to FEMA P-348, *Protecting Building Utility Systems from Flood Damage*. The list of M&E and the elevation requirements for documenting floodplain management compliance are different than the NFIP insurance M&E discount eligibility considerations. See Section H Instructions for additional information.

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED) *(Continued)*

Item C2.f. Enter the finished Lowest Adjacent Grade (LAG) elevation of the ground, sidewalk, or patio slab next to and in direct contact with the building. For a building in Zone AO, use the natural grade elevation, if available. Indicate whether the natural or finished grade was used. If natural grade was used, attach the source of the information (e.g., a grading plan). For buildings under construction in any flood zone, enter the LAG elevation at the time of the survey. **Note:** Natural grade means the undisturbed natural surface of the ground prior to any excavation or fill.

Item C2.g. Enter the finished Highest Adjacent Grade (HAG) elevation of the ground, sidewalk, or patio slab next to and in direct contact with the building. For a building in Zone AO, use the natural grade elevation if available. Indicate whether the natural or finished grade was used. If natural grade was used, attach the source of the information (e.g., a grading plan). For buildings under construction in any flood zone, enter the HAG elevation at the time of the survey.

Item C2.h. Enter the finished LAG elevation of the lowest ground, sidewalk, or patio slab next to and in direct contact with the structurally-attached-deck supports or stairs structurally attached to the building. For buildings under construction in any flood zone, enter the lowest LAG at the time of the survey.



Figures for use in determining Item C2.c

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by state law to certify elevation information. Complete as indicated and place your license number, your seal (as allowed by the state licensing board), your signature, and the date 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 relevant and clarifying information not specified elsewhere on the certificate, including supporting information for latitude/longitude source for A5; openings for A8/A9; LOMR data for Section B; BFE and BFE source data for B9/B10; datum conversion for C2; grading plan for natural grade used in C2.f-g; machinery type and location for C2.e; and any other relevant information identified in the instructions or needed for clarification. If attachments are included, check the attachments box and describe the attachments in the Comments area.

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO, ZONE AR/AO, AND ZONE A (WITHOUT BFE)

Complete Section E if the building is located in Zone AO, Zone AR/AO, or Zone A (without BFE) and the Certificate is being completed for the purpose of documenting compliance with local floodplain management requirements. If the Certificate is being completed to document compliance in other flood zones, including Zone A (with BFE), to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request, or to provide a ground elevation for flood insurance rating, complete Section C instead of Section E. Explain in the Section F Comments area if the measurement provided under Items E1–E4 is not based on the "natural grade." Natural grade means the undisturbed natural surface of the ground prior to any excavation or fill.

Indicate whether the measurements to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those measurements that can be determined in Items E1–E4. Use the Comments area of Section F to provide measurements obtained from the construction plans or drawings. Select "Finished Construction" only when all Machinery and Equipment (M&E) such as furnaces, water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Note: Enter heights in Items E1–E4 to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items E1.a and b. Enter in Item E1.a the height of the top of the bottom floor (as indicated by C2.a in the selected Building Diagram, Item A7) above or below the natural HAG. Enter in Item E1.b the height of the top of the bottom floor (as indicated by C2.a in the selected Building Diagram, Item A7) above or below the natural LAG. For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the HAG at least as high as the base flood depth on the FIRM.

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE) *(Continued)*

Item E2. For Building Diagrams 6–9 with permanent flood openings (see pages 18–19), enter the height of the next higher floor or elevated floor (as indicated by C2.b in the selected Building Diagram, Item A7) above or below the HAG.

Item E3. Enter the height, in relation to the HAG 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, in relation to the HAG next to the building, of the platform elevation that supports the M&E servicing the building. See Item C2.e for additional details on M&E. Indicate the M&E type in the Comments area of Section F.

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.

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

Complete as indicated. This section is provided for certification of measurements when completing Sections A, B, and E. If Section E is completed by a property owner or property owner's authorized representative in Zone AO, AR/AO, or A (without BFE), then the community should confirm the heights in Section E to ensure compliance with community floodplain management ordinances. If Section E is completed by a local floodplain management official, then complete Item G2.a and Section G instead of Section F. The address entered in this section must be the actual mailing address of the individual who provided the information on the certificate. Check the box as indicated if including attachments and describe in the Comments area.

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION)

The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C, E, G or H of this Elevation Certificate and sign this section. Section C may be completed by the local official per the instructions below for Item G1.

Item G1. Check if Section C is completed with elevation data from other documentation that has been signed and sealed by a licensed land surveyor, engineer, or architect who is authorized by state 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 state law to certify elevation information, and you performed the actual survey for a building in any flood zones (including Zones A99, B, C, X and D), you must also complete Section D.

Item G2.a. Check if information is entered in Section E by the community for a building in Zone A (without a BFE), Zone AO, or Zone AR/AO, or when the community certifies Item E5 for a building in Zone AO.

Item G2.b. Check if information is entered in Section H by the community for insurance purposes.

Item G3. Check if the community official is correcting information provided in Sections A, B, E and H. Describe corrections in the Comments area of Section G.

Item G4. Check if the information in Items G5–G11 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 G5–G11 provide a way to document these determinations.

Item G5. Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

Item G6. Date Permit Issued. Enter the date the permit was issued for the building.

Item G7. 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 G8. 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 (or meets the community's more restrictive standards, if applicable). The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

Item G9.a. 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.b. As-built lowest horizontal structural member. Enter the elevation measured at the bottom of the lowest horizontal structural member of the floor indicated by the selected Building Diagram (Item A7) or in the figure at the end of the instructions for Section C. Indicate the elevation datum used.

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION) *(Continued)*

Item G10.a. BFE. Using the appropriate FIRM panel, FIS, 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.b. Community's minimum elevation or depth requirement. Enter the elevation (including freeboard above the BFE) to which the community requires the lowest floor or the lowest horizontal structural member to be elevated. Indicate the elevation datum used.

Item G11. Indicate Yes if a variance from the floodplain management regulations (Title 44 CFR § 60.6) has been issued for the building, attach the supporting documentation, and describe the attachment in the Comments area of this section. If no such variance has been issued, indicate No.

Enter your name, title, and telephone number, and the name of the community and add any comments. Sign and enter the date in the appropriate blanks.

SECTION H – BUILDING'S FIRST FLOOR HEIGHT INFORMATION FOR ALL ZONES (SURVEY NOT REQUIRED) (FOR INSURANCE PURPOSES ONLY)

In any flood zone the property owner, owner's authorized representative, or local floodplain management official may complete this certificate for rating purposes to determine the building's first floor height and identify the elevation of Machinery and Equipment (M&E) servicing the building. Sections A, B, and I must also be completed.

Note: If Sections C and/or E and H are all completed, then information in Section C will prevail for insurance purposes and for compliance.

Item H1.a. For Building Diagrams 1A, 1B, 3, and 5–9 shown on pages 17–19, enter in Item H1.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 selected Building Diagram, Item A7) above the LAG. Refer to the arrows on the Foundation Type Diagrams on page 16 that indicate which floor to use to determine the height for Item H1.a.

Item H1.b. For Building Diagrams 2A, 2B, 4, and 6–9 shown on pages 17–19, enter in Item H1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the next higher floor or elevated floor (as indicated in the selected Building Diagram, Item A7) above the LAG. Refer to the arrows on the Foundation Type Diagrams on page 16 that indicate which floor to use to determine the height for Item H1.b.

Note: The LAG is the lowest point of the ground level immediately next to a building.

Item H2. Indicate “Yes” if ***all*** of the following M&E servicing the building, inside or outside the building, are elevated to at least the height of the location shown by the H2 arrow in the Foundation Type Diagrams on page 16: central air conditioner (including exterior compressor), furnace, heat pump (including exterior compressor), water heater, and elevator M&E. For contents-only insurance coverage, ***all*** of the following appliances will need to be elevated to at least the height of the location shown by the H2 arrow in the Foundation Type Diagrams below: clothes washers and dryers and food freezers.

Note: For both building and contents coverage, ***all*** of the M&E and appliances listed above must be elevated per the Foundation Type Diagrams on page 16 to be considered for the M&E mitigation discount.

Indicate “No” if any of the M&E listed above is not elevated to at least the height of the location shown by the H2 arrow in the Foundation Type Diagrams on page 16.

The diagrams on the following page illustrate the six NFIP Foundation Type Diagrams. Each foundation type corresponds with one or more of the eleven Building Diagrams shown at the end of this Elevation Certificate. The arrows on the diagrams indicate which floor to use to determine H1.a and H1.b The arrows marked as H2 show the minimum elevation required to be eligible for the M&E mitigation discount.

SECTION I – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements when completing Sections A, B, and H. If Section H is completed by a local floodplain management official, then complete Item G2.b and Section G instead of Section I. The address entered in this section must be the actual mailing address of the individual who provided the information on the certificate.

Check the box as indicated if including attachments (e.g., required photos) and describe in the Comments area.

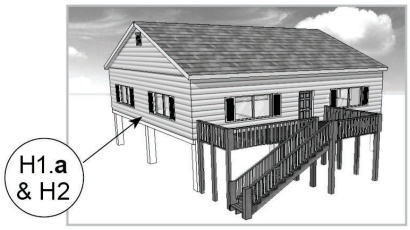
Foundation Type Diagrams (for use in Section H):

Slab on Grade (Non-Elevated)

Corresponds to EC Diagrams 1A, 1B and 3

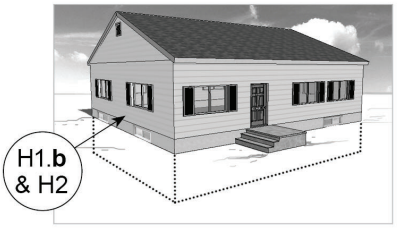
Note: If the building has more than one floor, the Machinery and Equipment should be on the second floor or higher.

Elevated without Enclosure on Posts, Piles, or Piers



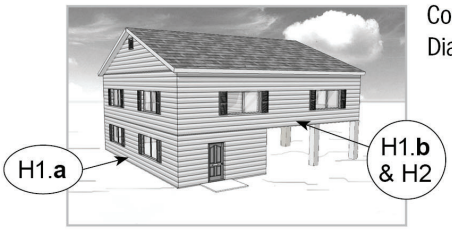
Corresponds to EC Diagram 5

Basement (Non-Elevated)



Corresponds to EC Diagrams 2A, 2B and 4

Elevated with Enclosure on Posts, Piles, or Piers

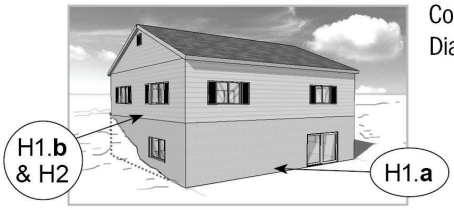


Corresponds to EC Diagram 6

Crawlspace (Elevated, including Non-Elevated Sub-Grade Crawlspace)

Corresponds to EC Diagrams 8 and 9

Elevated with Enclosure Not on Posts, Piles, or Piers (Solid Foundation Walls)



Corresponds to EC Diagram 7

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 as indicated in Items A8.a–f, the square footage of attached garage and the area of flood openings as indicated in Items A9.a–f, and the elevations in Items C2.a–h.

In A, B, C, X and D zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, areas seaward of the LiMWA, and in other areas regulated for coastal flooding hazards, the floor elevation is taken at the bottom of the lowest horizontal structural member (see figure at end of 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 one side.*

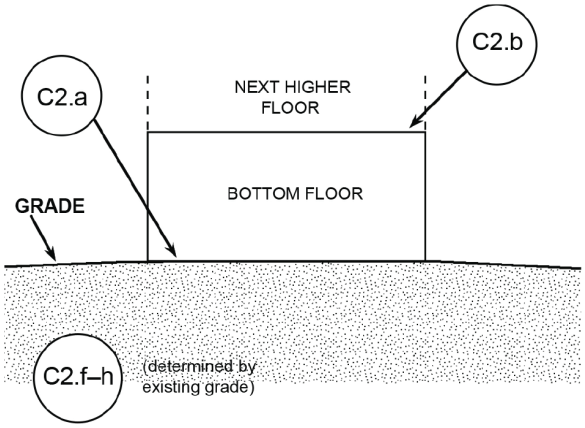


DIAGRAM 1B:

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 one side.*

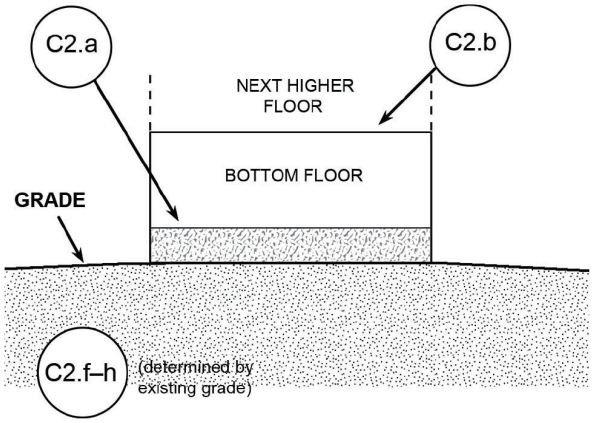


DIAGRAM 2A:

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.*

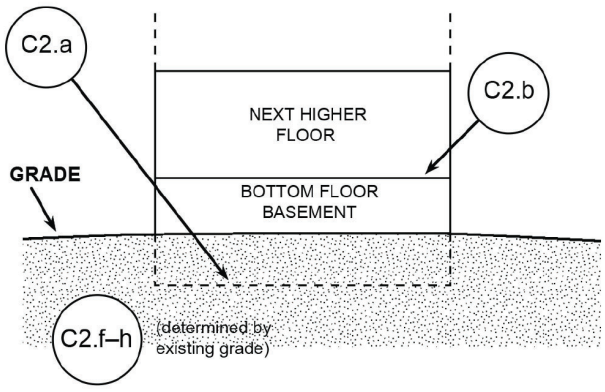
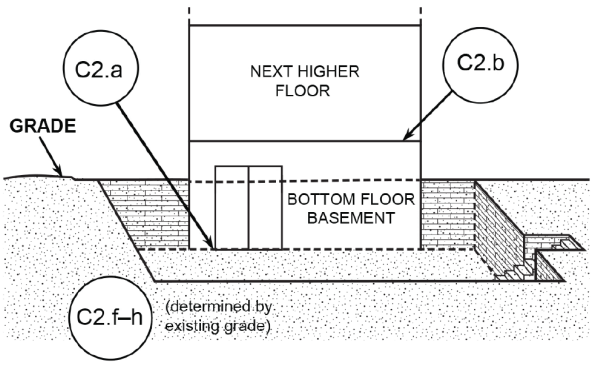


DIAGRAM 2B:

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 one side.*

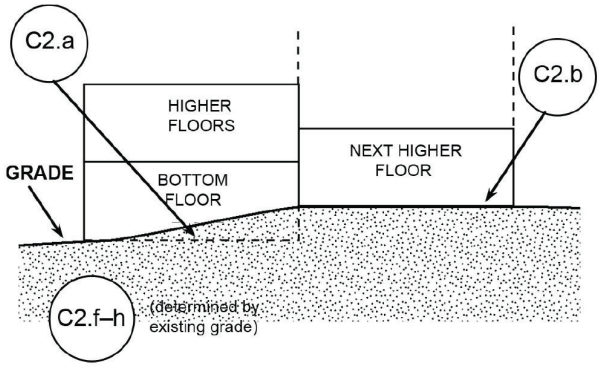


DIAGRAM 4:

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.*

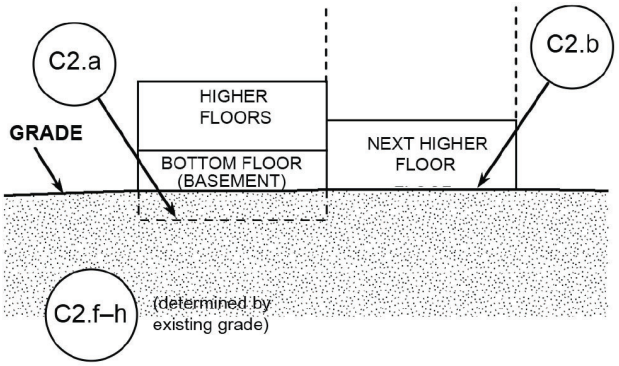


DIAGRAM 5:

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).

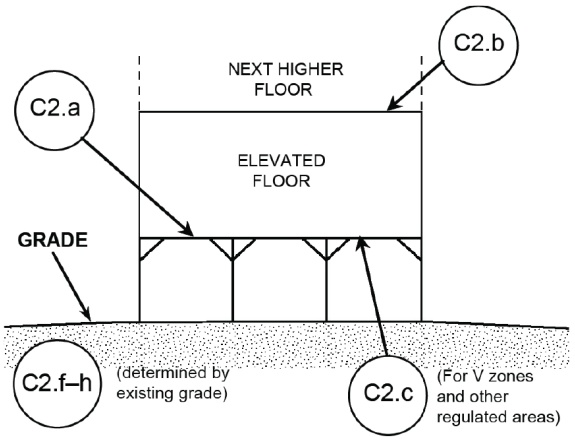
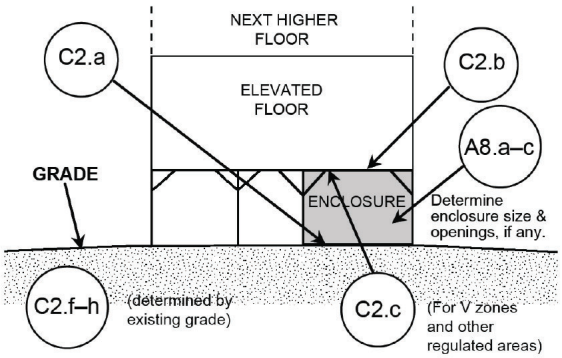


DIAGRAM 6:

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 two openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than one 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 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 two sides of the enclosed area. If a building has more than one 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 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.

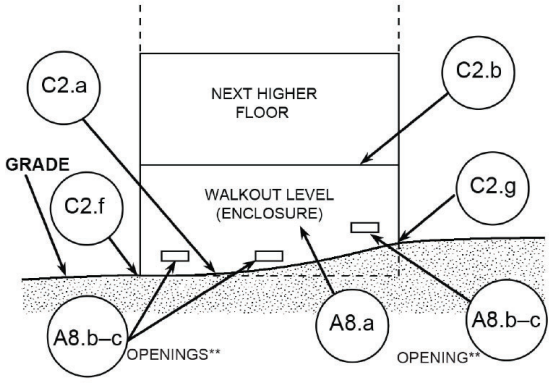


DIAGRAM 8:

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. (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, use Diagram 7.)

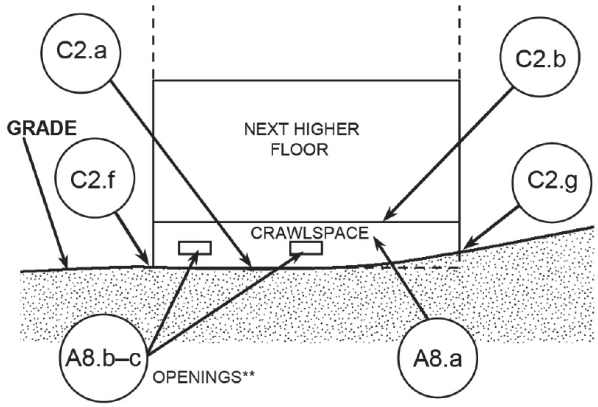
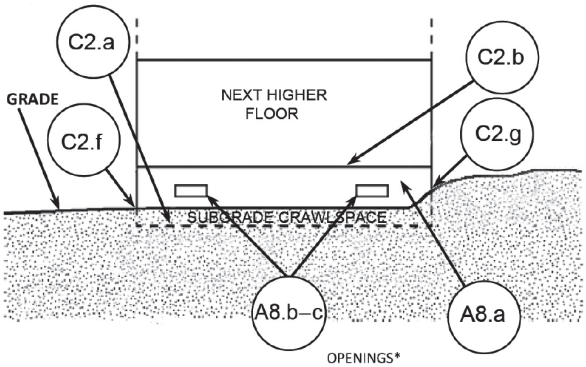


DIAGRAM 9:

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 five feet, or the crawlspace floor is more than two 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 two openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than one 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 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 two sides of the enclosed area. If a building has more than one 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.

Guidance for Flood Risk Analysis and Mapping

MT-1 Technical Guidance

November 2022

FEMA

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/guidelines-and-standards-flood-risk-analysis-and-mapping). 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 https://www.fema.gov/resource-document-library.

Table of Revisions

The following summary of changes details revisions to this document subsequent to its most recent version in November 2021.

Affected Section or Subsection	Date	Description
Section 1	Nov. 2022	Listed specific CFR sections for relevant regulations.
Section 2, 2.4	Nov. 2022	Added language to clarify that MT-1 documents issued by FEMA are not permits and should not be considered approval that all State and local requirements have been met.
Sections 2 and 3	Nov. 2022	Added exclusions for when the MT-1 process cannot be used, including properties located on a Primary Frontal Dune (PFD), reviews within suspended or non-participating communities, and reviews for which potential compliance issues are identified.
Section 2.2	Nov. 2022	Added provisions for cases which may require the MT-2 application process.
Section 3.4	Nov. 2022	Added scenario for when site survey may be required when a structure is in the vicinity of a regulatory floodway or CHHA.
Section 3.5, 4, 4.8	Nov. 2022	Added clarification for determining elevations when the metes and bounds follow the top of a retaining wall.
Section 4.1	Nov. 2022	Added provisions for large subjects (5 acres or 50 lots) in approximate Zone A SFHAs.
Section 4.7	Nov. 2022	Incorporated provisions for when a structure built within a Zone AO SFHA can be removed.
Sections 4.1, 4.11 and 6.0	Nov. 2022	Updated to remove potentially outdated information related to insurance.
Sections 3.2, 5.0, 6.0	Nov. 2022	Implemented lower-case capitalization of “lidar” for consistency with style guide.
All sections	Nov. 2022	Implemented various minor updates for consistency and clarity.

Table of Contents

List of Figures

List of Tables

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), Part 65, Section 65.5 and Part 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 **Error! Reference source not found.**).

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 documents issued by FEMA are **NOT** permits and should not be considered approval that all State and local requirements have been met, such as any higher floodplain management standards that have been adopted by many communities. MT-1 comment documents 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 (CLOMA, CLOMR-F, LOMA, and LOMR-F) 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/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review), 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 proposed OR existing as-built 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. See the complete definition of Development at CFR 44 59.1 and in Section 6, Glossary.
    - 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.
- 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 on a Primary Frontal Dune (PFD).
- 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 LOMR-F, CLOMR-F, or LOMR-FW applications in a non-participating or suspended community since there is no one within the community authorized to sign the Community Acknowledgement Form.

- Review of any Conditional Letter of Map Revision based on Fill (CLOMR-F) or LOMR-F for an existing or proposed landfill site.

The majority of the request types listed above must be reviewed under the MT-2 process. Please visit fema.gov at https://www.fema.gov/flood-maps/change-your-flood-zone/lomr-clomr for more information on the MT-2 process.

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. The subject cannot be located on a PFD.

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 comment documents issued by FEMA are NOT permits and should not be considered approval that all local requirements have been met, such as any 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:

- Conditional LOMCs are based on proposed construction, including proposed fill (when applicable), and proposed property or structure elevations. As-built elevation and fill information is not required.

- The Conditional comment documents that are issued do not amend or revise 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/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review.

- Conditional requests with significant alterations proposed to the flood hazard information (flood boundaries, drainage changes, floodway development, BFE changes, etc.) will typically result in a letter to the applicant to inform that an MT-2 (CLOMR or LOMR) is required.

Once the request is as-built, a LOMA or LOMR-F should follow the CLOMA or CLOMR-F. Follow-up to a CLOMR (MT-2) that was issued needs to be accomplished through the LOMR (MT-2) application process.

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
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, generates the equivalent of a Property Information Form. All other forms (MT-1 or MT-EZ, as appropriate) and all other 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.

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 current effective FIRM is revised, the subject of the determination will not be within the SFHA. If a compliance issue is identified, a comment document may include additional wording to notify the applicant of the potential violation which may delay or prevent issuance of a final as-built determination (LOMA or LOMR-F). Comment documents are not permits and should not be considered approval that all State and local requirements have been met, such as any higher floodplain management standards that have been adopted by many communities.

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 current 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 legal description and map for the property or a metes and bounds description and map for a portion of the property, containing the area of any existing or proposed structure(s). The property request is then processed as a LOMA.

Informational Response Letters

- Due to the nature of the request, an MT-2 is required and the request 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, or is not eligible to sign (suspended or non-participating community), 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 potential violation of a CHHA regulation.
- The subject of the determination is located on a PFD.
- A LOMR-FW, LOMR-F or CLOMR-F cannot be processed because the community does not participate in or is suspended from the NFIP.
- The review identifies a possible compliance issue and a Potential Violation response is distributed.
- The request is in an alluvial fan SFHA and the MT-1 process cannot be used to issue a determination document or comment document for a subject in an alluvial fan SFHA.
- 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 https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1.

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 and dated request.

- MT-1 Property Information Form (Form 1).
- MT-EZ Property Information Form (Section A).
- Completed Online LOMC or eLOMA request (physical 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."

   Note: It is not acceptable to change or delete any of the standard wording on the MT-1 application forms.

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).

Note: If the subject of review is determined to be impacted by an unresolved potential violation previously identified through any LOMC action (MT-1 or MT-2), a determination may not be issued until the potential violation is resolved.

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. If the plans are not revised for an identified compliance issue, the comment document may include additional wording to notify the applicant of the potential violation which may delay or prevent issuance of a final as-built determination (LOMA or LOMR-F).

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 or suspended 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 partially shown within the effective regulatory floodway, both sections A and B of the form must be completed.

- A LOMR-FW, LOMR-F or CLOMR-F cannot be processed if the community does not participate in or is suspended from the NFIP because no one within the community is authorized to sign the Community Acknowledgement Form.

- 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.

- 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 or CHHA as shown 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.

  - There are usually costs associated with gathering the data necessary to apply for a LOMC and FEMA will not reimburse an applicant for any 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/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review).

- 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.

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
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

- Additional 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% 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% 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% 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.
- May be required for structure(s) in the vicinity of a regulatory floodway or CHHA.
- 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.
  - Metes and bounds area follows the top of a retaining wall requiring the LLE to be taken at the bottom (outside) of the wall likely resulting in a LLE below the BFE.
  - Metes and bounds description is not submitted in digital format.
- Recommendations for metes and bounds areas:
  - 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.

- 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

Forms[1]	CLOMA	CLOMR-F	LOMA	LOMR-F	LOMR-FW[2]	LOMR-VZ[3]
Property Information Form	Required	Required	Required	Required	Required	Required
Elevation Data[4]	Required[4]	Required[4]	Required[4]	Required[4]	Required[4]	Required[4]
Elevation Form (continuation)[5]	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[6]	Required[6]	Required[6]	Not Required	Required[6]	Not Required	Not Required
Additional Data	**CLOMA**	**CLOMR-F**	**LOMA**	**LOMR-F**	**LOMR-FW[4]**	**LOMR-VZ[5]**
Recorded Deed OR Recorded Plat	Not Required	Not Required	Required	Required	Required	Required
Tax Map[7]	Required	Required	Required	Required	Required	Required
Annotated FIRM	Required	Required	Required	Required	Required	Required
ESA Compliance	Not Required	Required	Not Required	Not Required	Not Required	Not 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.
7 A tax map or other suitable map is needed to accurately show the location of the property.

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 (no clear separation between the mapped SFHA and the structure), the determination or comment is based on a comparison of the effective (regulatory) BFE or 1% 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. The LAG should be inclusive of both buildings due to the breezeway attaching both buildings, as depicted in Figure 1.

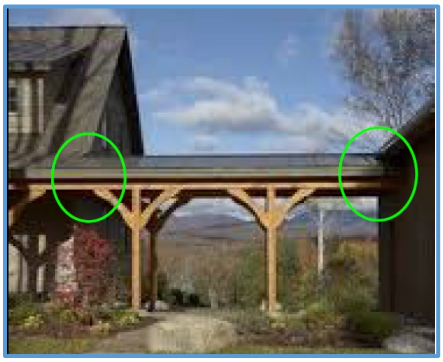


Figure 1: Example of Buildings Attached by a Breezeway

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. Additional information on the appropriate location to take a LAG is also available in Section 4.10, Natural Intervening High Ground Considerations. Figure 2 and Figure 3 show examples of an appropriate LAG for a structure.

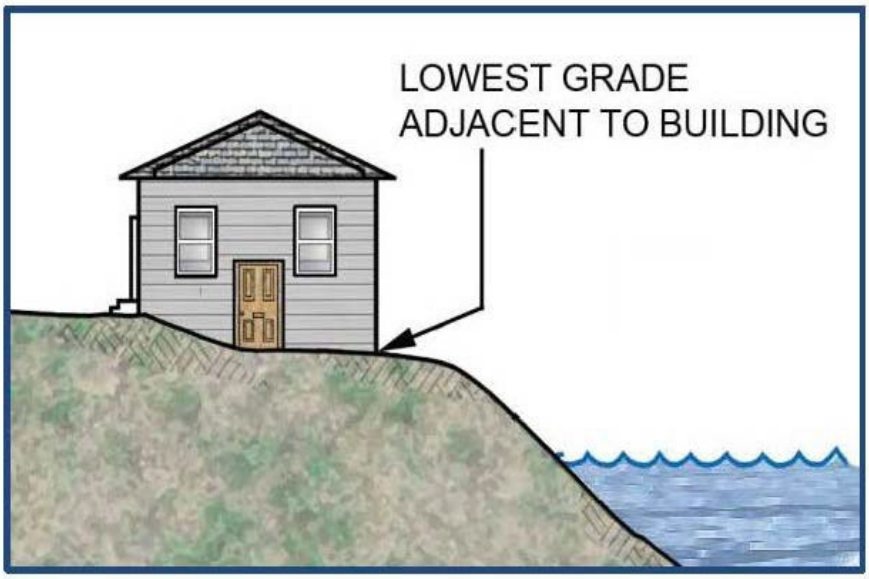


Figure 2: LAG - Lowest Ground Touching a Structure

Figure 3: LAG - Structure with Attached Deck

When a **lot (property)** encroaches on the SFHA (no clear separation between the mapped SFHA and the property),), the determination or comment is based on a comparison of the effective BFE or 1% 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 5 and Figure 6).

Figure 4: 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.

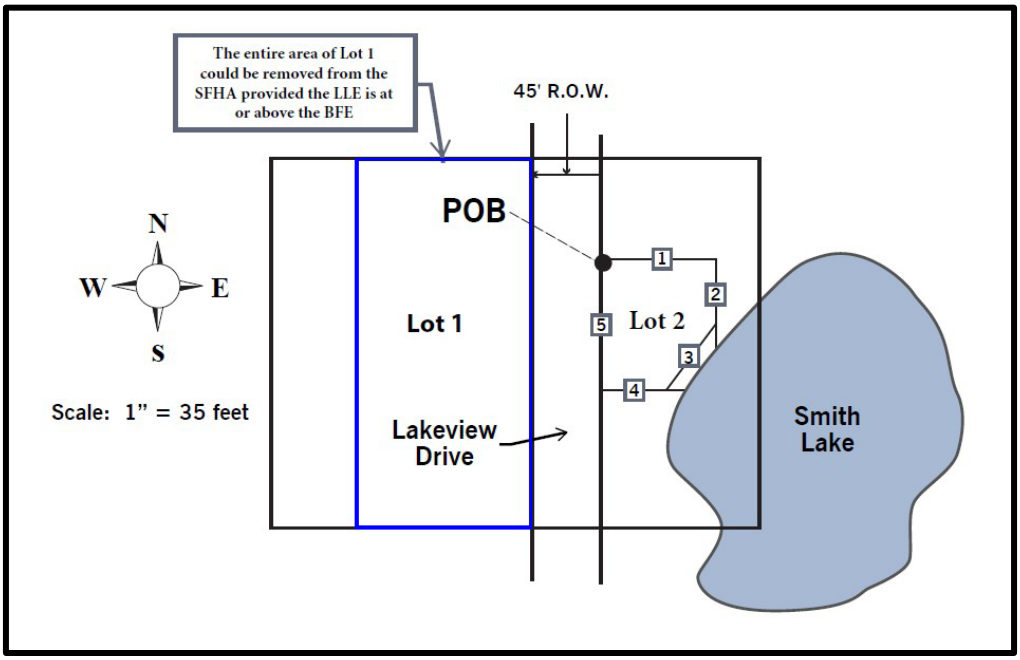


Figure 5: Entire Property - Lot 1 - No Watercourse

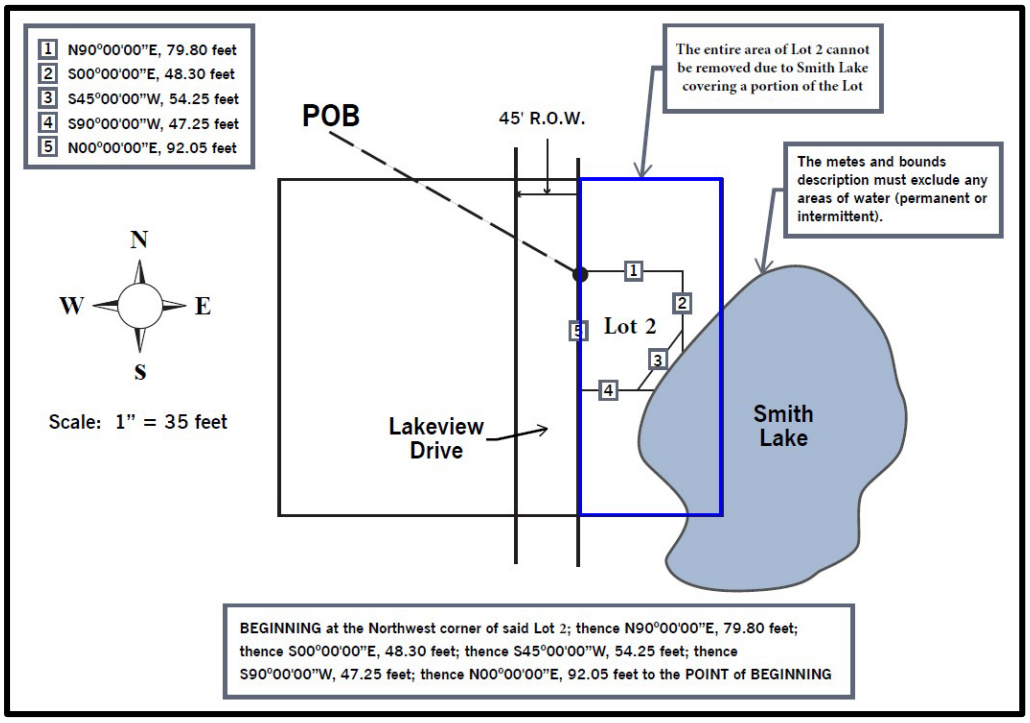


Figure 6: Portion of Property – Lot 2 – With Watercourse

When a **portion of property** encroaches on the SFHA, the determination or comment is based on a comparison of the effective BFE or 1% 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 a written description and a map, both 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.

Note: If a metes and bounds area follows the top of a retaining wall the LLE will be taken at the bottom (outside) of the wall, likely resulting in a LLE below the BFE and the issuance of a non-removal determination document or comment document.

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 the minimum NFIP regulations.

For instance, compliance reviews may compare the elevation of the top of a structure's bottom floor to the BFE or 1% annual-chance flood elevation; MT-1 reviews compare the lowest adjacent grade elevation to the BFE or 1% 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% 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% 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% annual-chance water-surface elevation for the subject(s).

Note: In an approximate Zone A SFHA, if the subject is larger than 5 acres or includes more than 50 lots, the applicant must provide certified 1% annual-chance flood elevations and supporting back-up data (CFR 44 60.3(b)(3)).

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.

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% 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

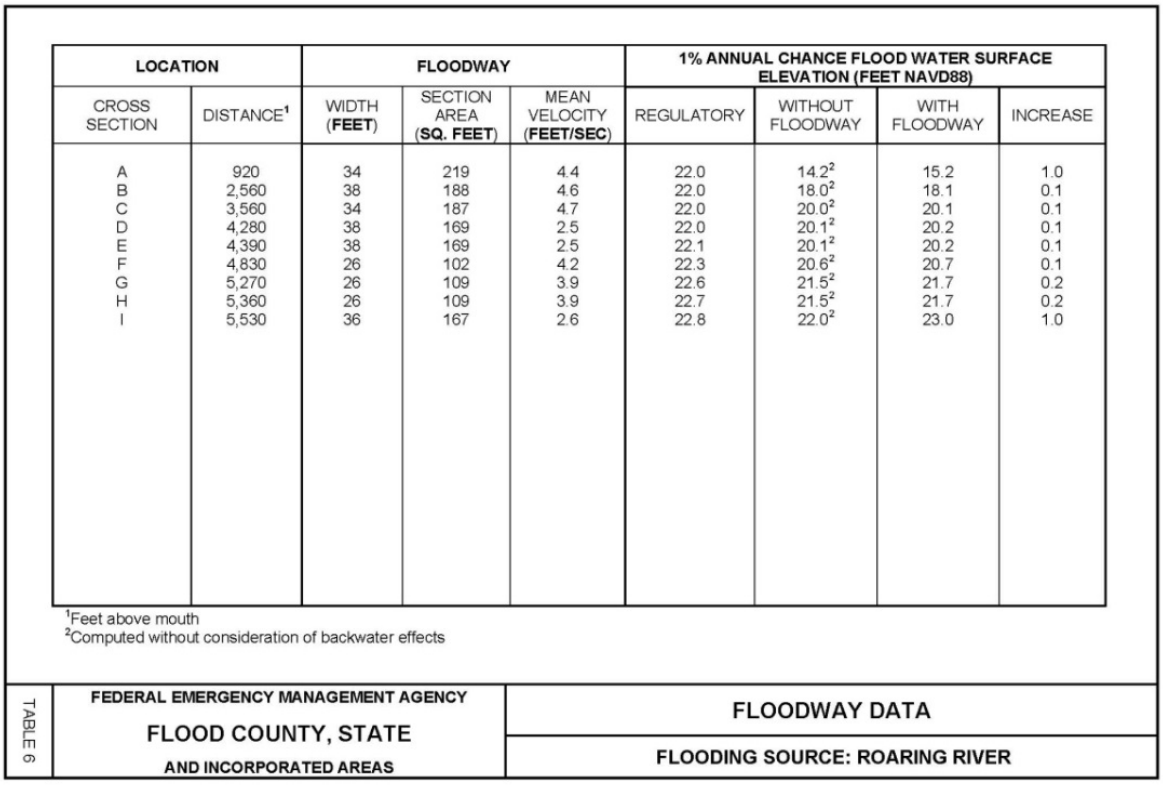
Type of Hazard	Zone	Data Element	Location - Description
Riverine	AE or A1-A30	Floodway Data Table (FWDT)	FIS report - The FWDT is produced for riverine flooding sources with a regulatory floodway. At each mapped cross section, the BFE is listed to the tenth of a foot (Figure 7).
Riverine	AE or A1-A30	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 (Figure 8).

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 9). 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[1]	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[2]	15.2	1.0
B	2,560	38	188	4.6	22.0	18.0[2]	18.1	0.1
C	3,560	34	187	4.7	22.0	20.0[2]	20.1	0.1
D	4,280	38	169	2.5	22.0	20.1[2]	20.2	0.1
E	4,390	38	169	2.5	22.1	20.1[2]	20.2	0.1
F	4,830	26	102	4.2	22.3	20.6[2]	20.7	0.1
G	5,270	26	109	3.9	22.6	21.5[2]	21.7	0.2
H	5,360	26	109	3.9	22.7	21.5[2]	21.7	0.2
I	5,530	36	167	2.6	22.8	22.0[2]	23.0	1.0

[1]Feet above mouth
[2]Computed without consideration of backwater effects

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY
FLOOD COUNTY, STATE
AND INCORPORATED AREAS

FLOODWAY DATA
FLOODING SOURCE: ROARING RIVER

Figure 7: Example of Floodway Data Table from FIS Report

Flood Profile

As the name indicates, a Stream Profile (Figure 8) 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% annual-chance or 100-year) flood. Many, but not all profiles, also contain a stream profile for the 10% (10-year), 2% (50-year), and 0.2% (500-year) flood elevations.

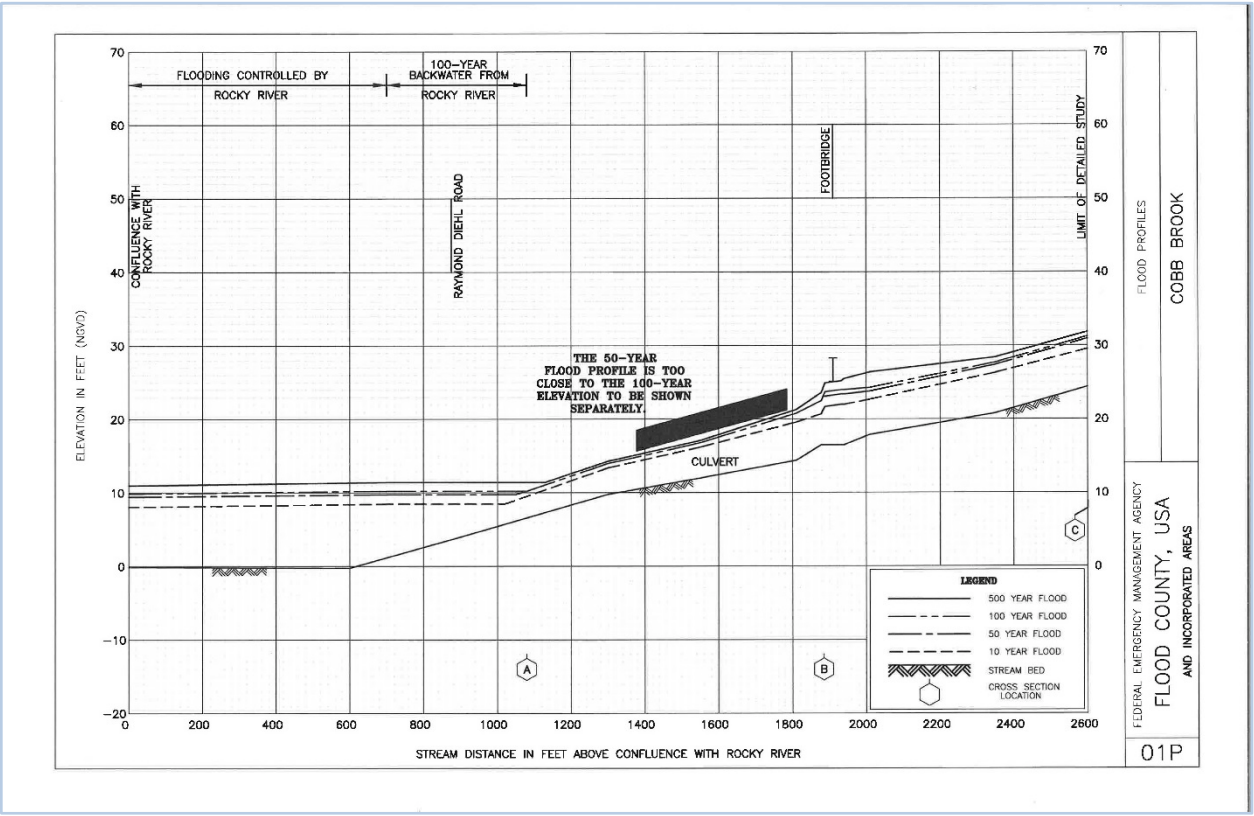


Figure 8: Example of Stream Profile from FIS Report

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 9, 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% 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.

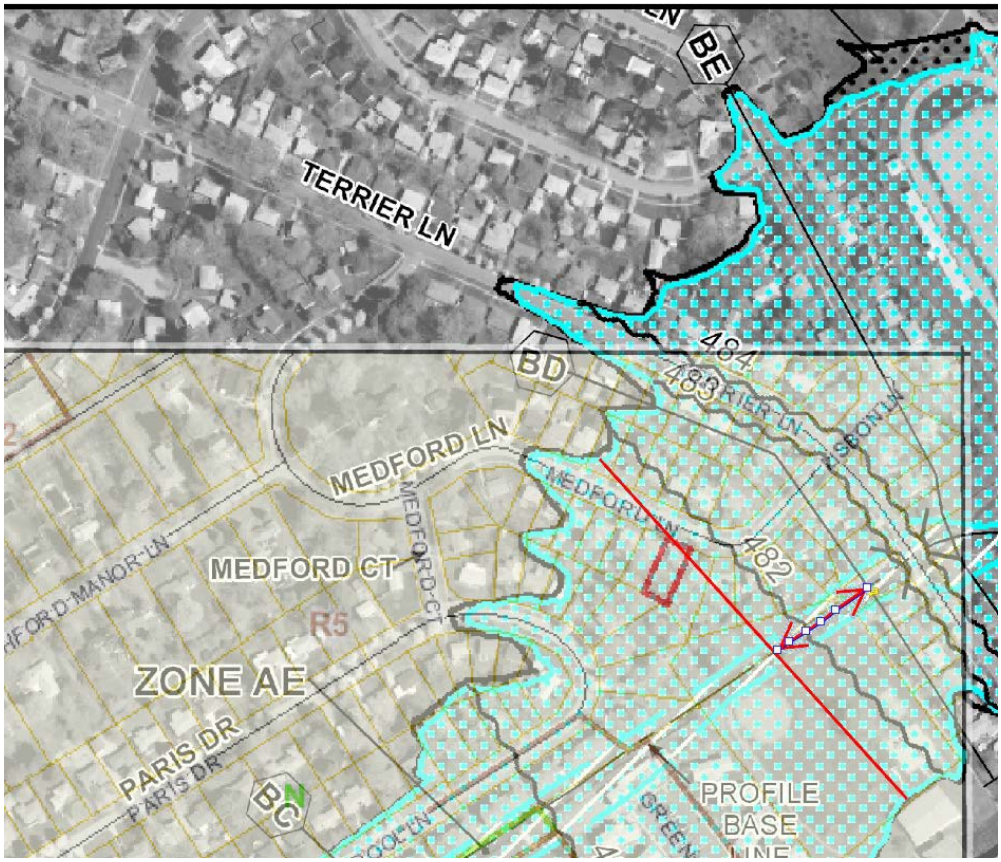


Figure 9: Measuring to Subject from a Cross Section (Not to Scale)

Example of Using a Stream Profile to Obtain a BFE (Figures 9 and 10):

1. The FIRM scale for this example is 1" = 500 feet (not to scale in Figure 9), and the measurement shown in Figure 9 is 106 feet from Cross Section BD to the subject.

2. The horizontal scale of the profile (Figure 10) 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% profile line is 482.0 feet (NAVD 88).

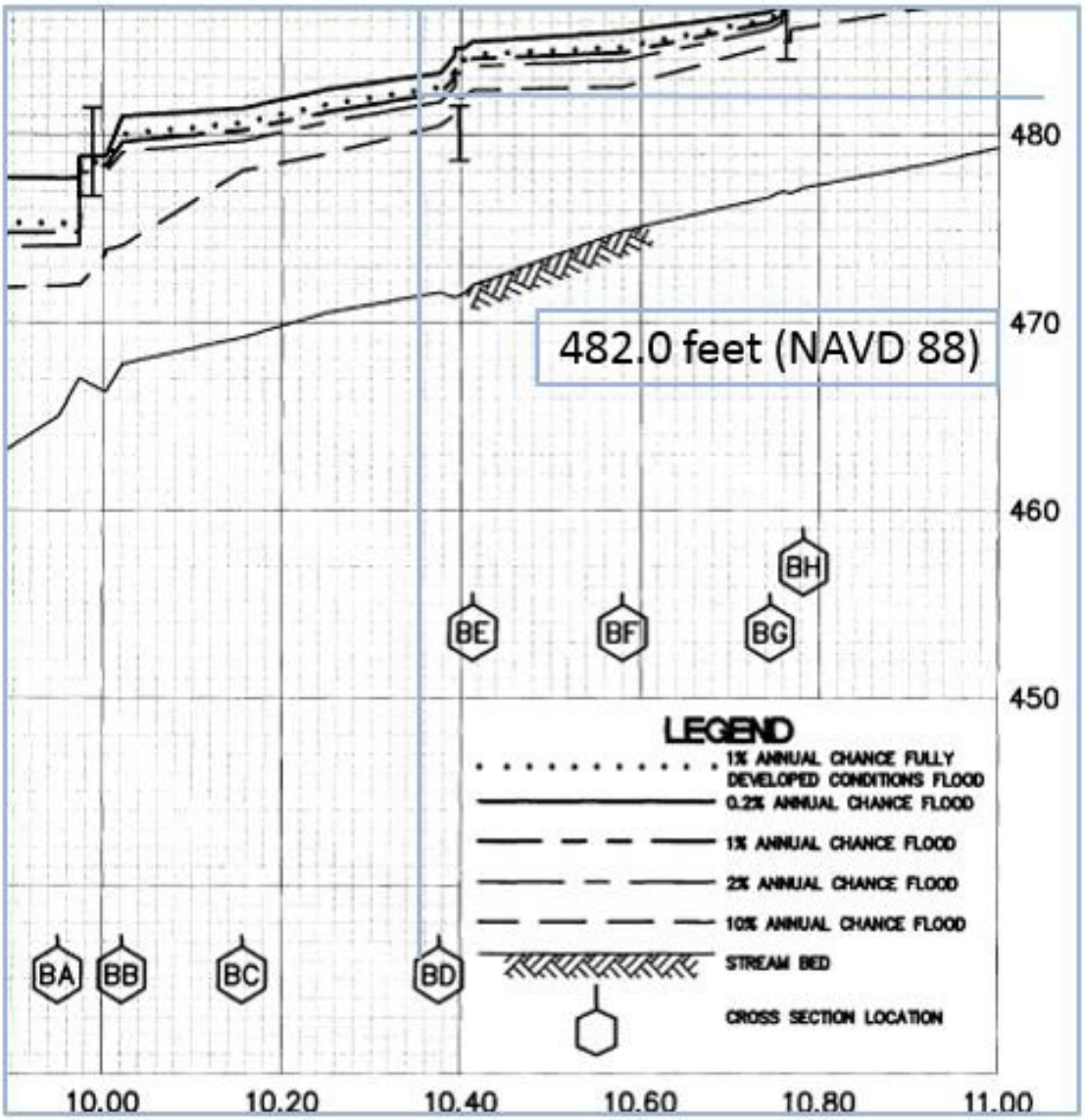


Figure 10: Portion of Stream Profile Used to Obtain BFE

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 =**101.0 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 11 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:

BFE= E1+(E2-E1) * (DS Distance)/(Total Distance) Or

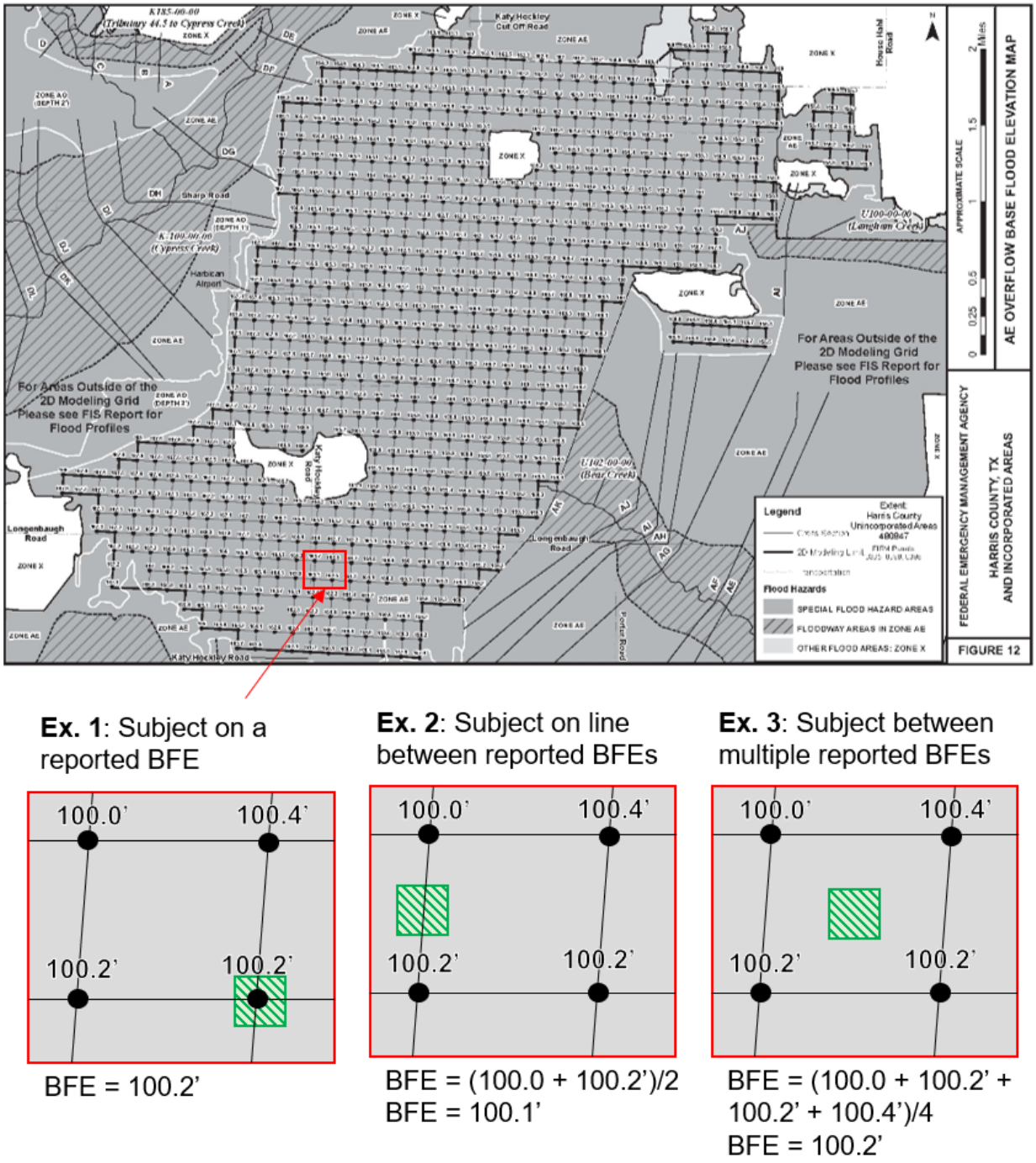
BFE=2,278+(2,282-2,278) * 62/(62+110)=2,279.4 feet

Figure 11: 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 12 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 12 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 12.



Ex. 1: Subject on a reported BFE

BFE = 100.2'

Ex. 2: Subject on line between reported BFEs

BFE = (100.0 + 100.2')/2
BFE = 100.1'

Ex. 3: Subject between multiple reported BFEs

BFE = (100.0 + 100.2' + 100.2' + 100.4')/4
BFE = 100.2'

Figure 12: 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.

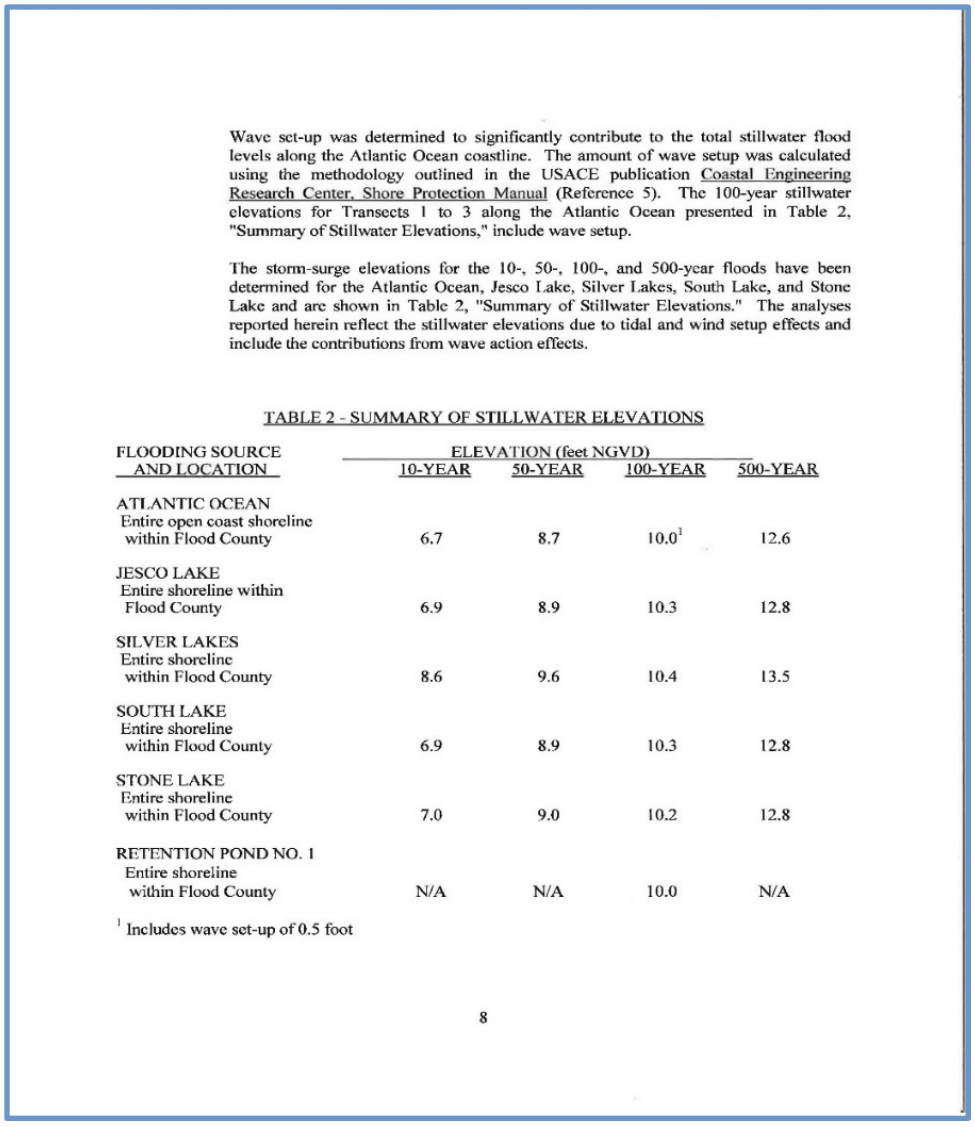
4.3. Lacustrine and Ponding Area SFHA Methodology

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 13.**Error! Reference source not found.** 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 13).
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 13).
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[1]	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

[1] Includes wave set-up of 0.5 foot

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Figure 13: 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/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review.

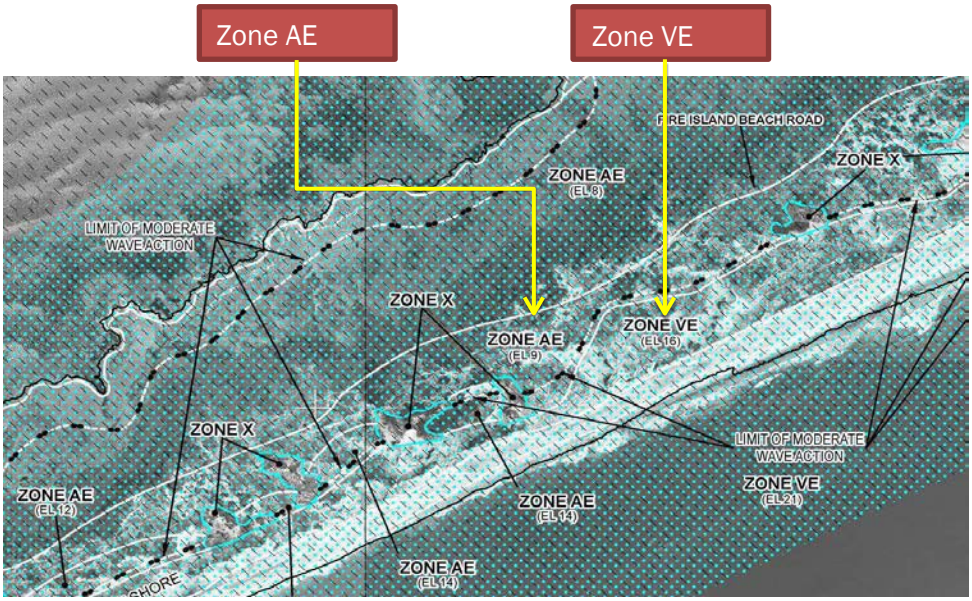


Figure 14: Snapshot of FIRM with Coastal Zones Identified

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/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review.

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 submitted 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.

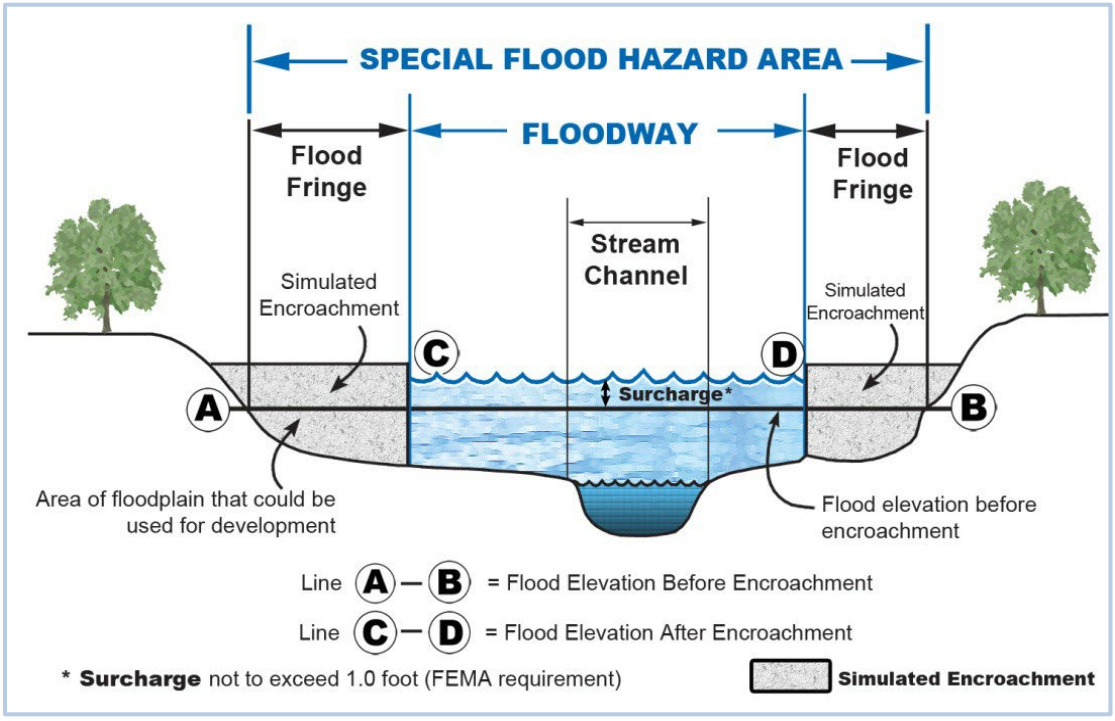


Figure 15: Regulatory Floodway Schematic

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% 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% annual-chance flood elevation completed by another federal agency, or from an acceptable state or local agency.
- An in-house calculation of the 1% 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% 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% 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% 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% annual-chance flood elevation for the area.

FEMA may require local survey data such as the following to complete the calculation of the 1% 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.

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 Zone AO SFHA has a defined velocity (MT-2 review is required).

Note: Both of the following conditions must be met for a structure built within a Zone AO SFHA to be removed from the Zone AO SFHA:

- The LAG of the structure must be at or above the calculated BFE;
- The lowfloor of the structure must be at or above the highest adjacent grade (HAG) PLUS the depth of flooding for the Zone AO as shown on the FIRM OR, for a **non-residential** structure have any low floor below the BFE floodproofed to or above the BFE (CFR 44 60.3(c)(7) and 60.3(c)(8)). The HAG is defined as the highest **natural** grade touching the structure (prior to any fill placement). *Example:* For a structure with a HAG of 100.0 feet and a Zone AO depth of 1 foot (Zone AO (1 foot) as shown on the FIRM), the low floor of the structure would normally need to be at or above 101.0 feet to be in compliance with the federal minimum requirements.

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 16): 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, and there are no compliance concerns, the subject may be removed from the SFHA.

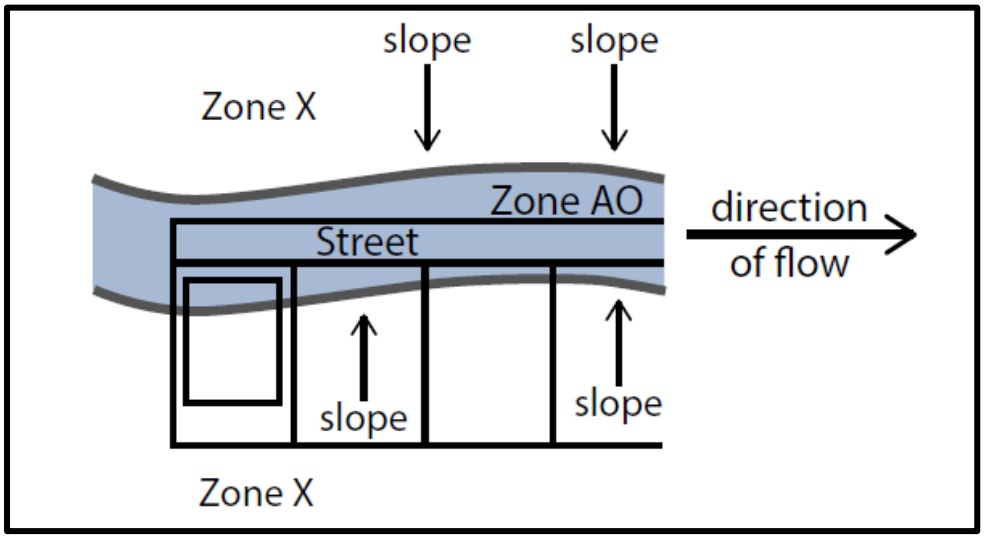


Figure 16: Zone AO SFHA Contained Primarily in Street

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 17): 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, and there are no compliance concerns, the subject of determination may be removed from the SFHA.

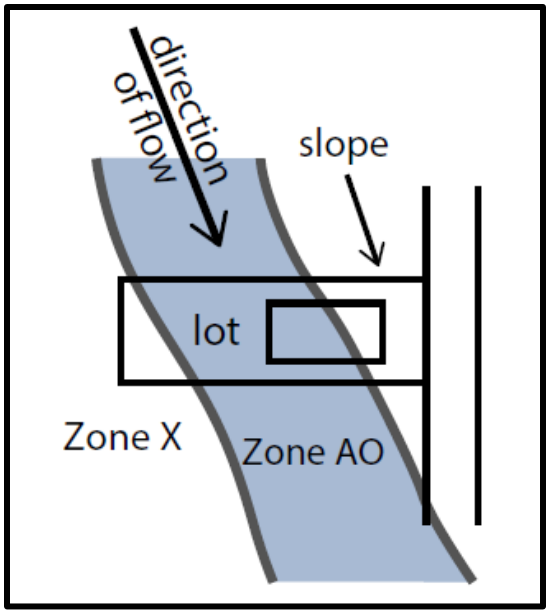


Figure 17: Portion of Property in Zone AO SFHA

Entire Property in the SFHA (see Figure 18)

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, and there are no compliance concerns, the subject of determination may be removed from the SFHA.

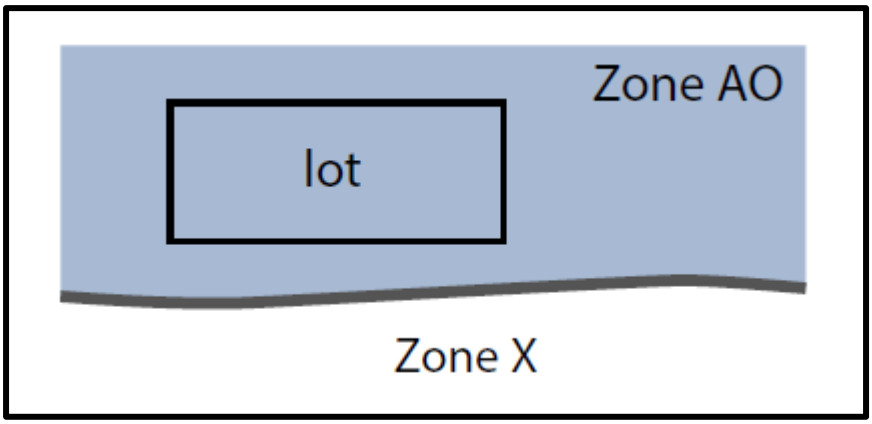


Figure 18: Entire Property in Zone AO SFHA

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

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 (Figure 19). 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, unless other applicable provisions of 44 CFR 60.3 are met, such as sufficient flood openings for an enclosure.

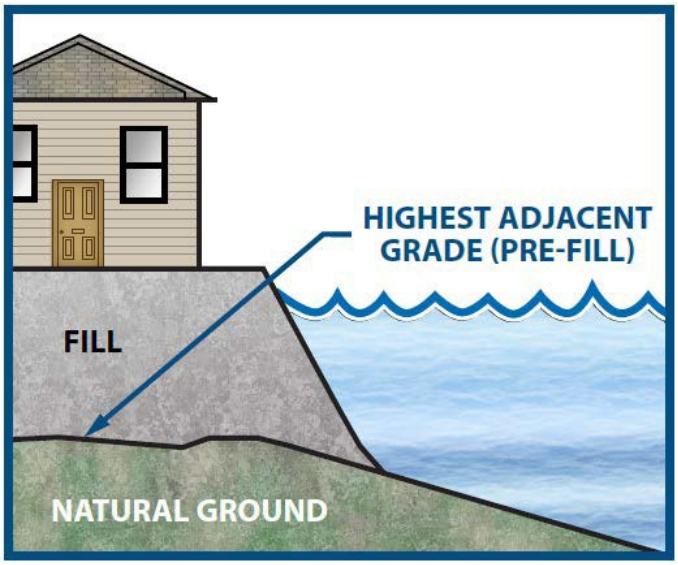


Figure 19: HAG for a Structure

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.
- It must include the required map and accompanying description and they must match.
- The required map and accompanying description must be certified.
- It must include bearings and distances 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.
- A metes and bounds area that follows the top of a retaining wall will have the LLE taken at the bottom (outside) of the wall. This will likely result in a LLE below the BFE and the issuance of a non-removal determination document or comment document.
- The metes and bounds description should be 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 20 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.

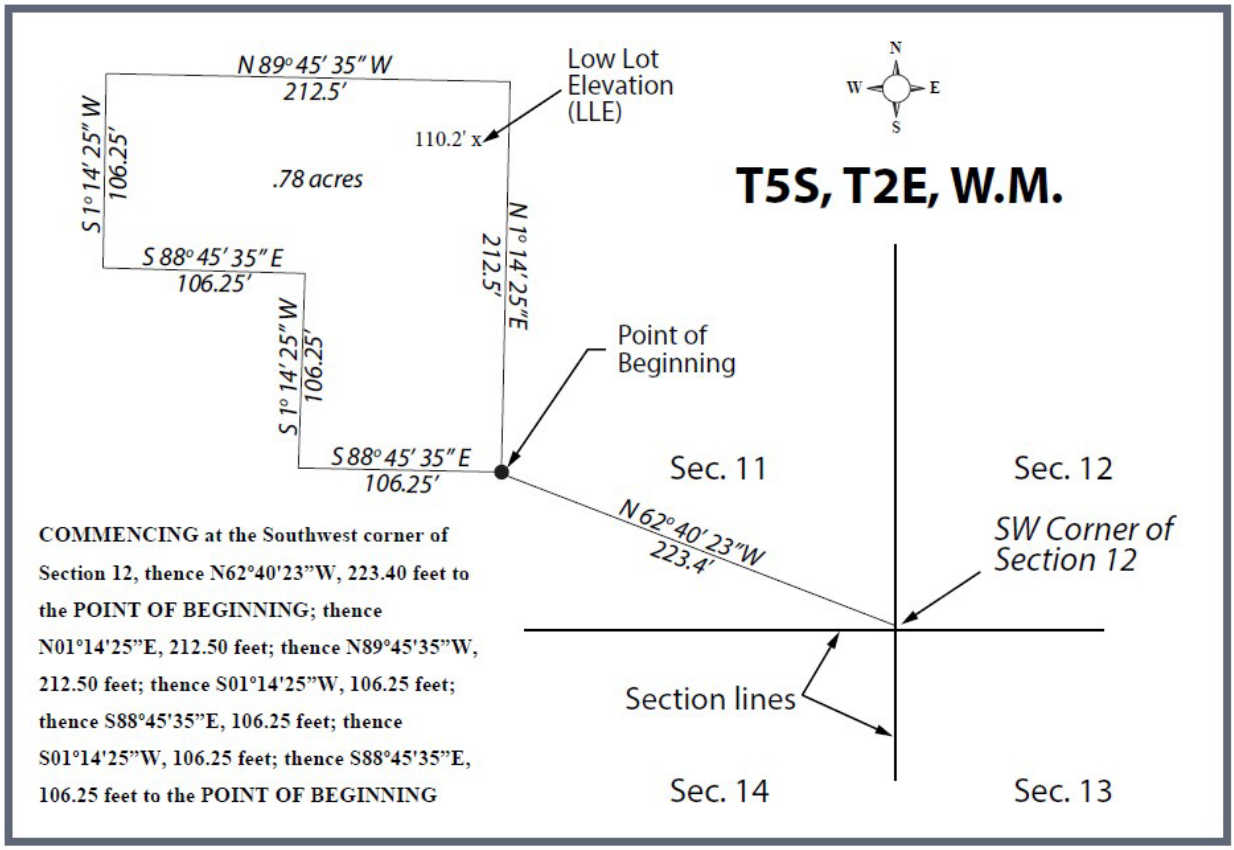


Figure 20: Example of a Metes and Bounds Description and Map

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.

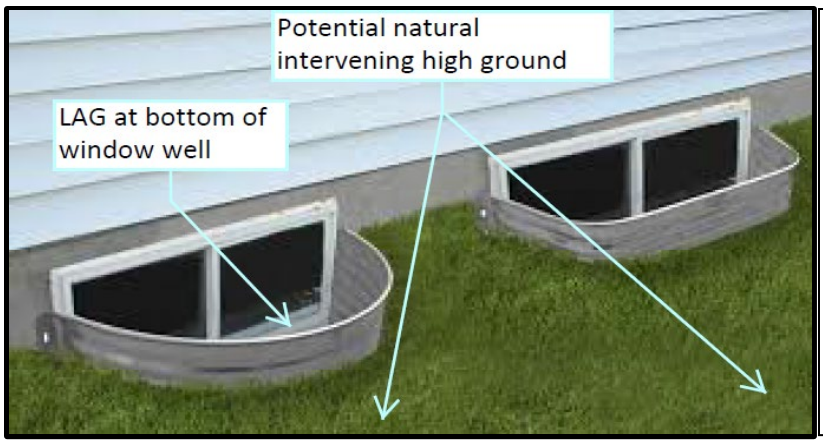
Submitted elevation information for a subject clearly shown outside of the SFHA on the effective FIRM must support an Out as Shown determination. If the elevation information does not support an Out as Shown determination, an Amend-In and Deny (non-removal) determination may be issued.

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. Natural 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 natural 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 natural 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 natural intervening high ground.



For an MT-1 request, intervening high ground must be natural ground, not based on fill or structural measures, and sufficient spot elevations must be provided to demonstrate the natural intervening high ground prevents inundation of the subject by the base flood.

Figure 21: Use of Natural Intervening High Ground – Window Well

Figure 22: Use of Natural Intervening High Ground – Exterior Basement Stairs

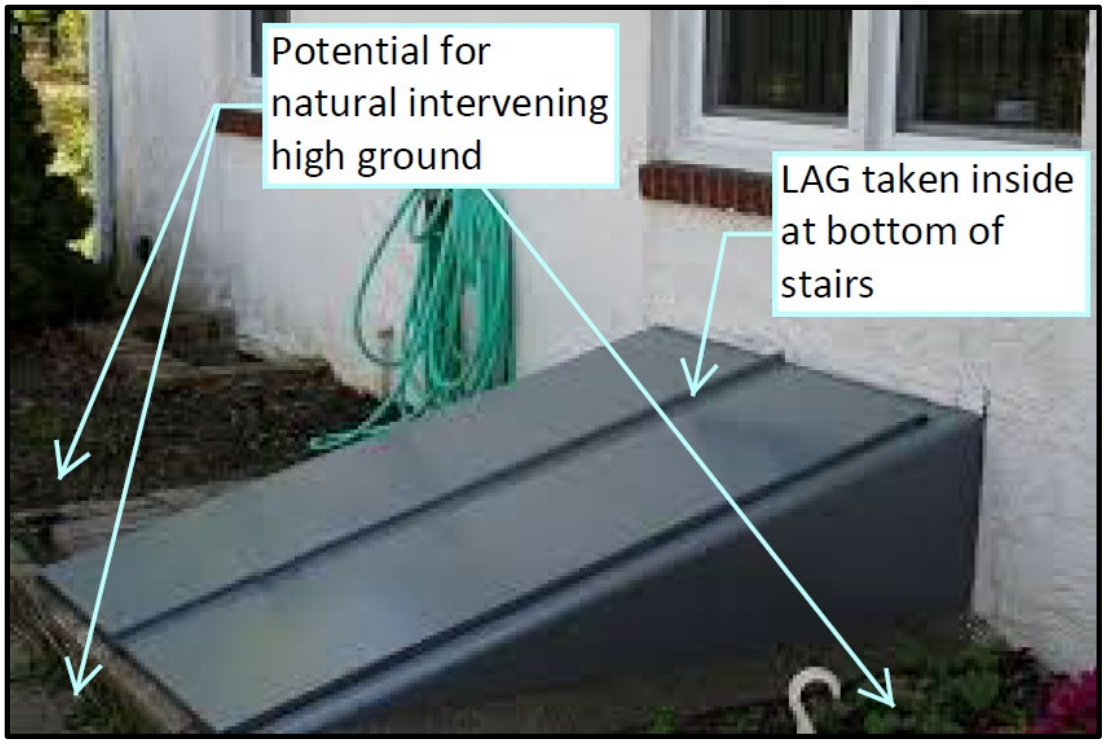


Figure 23: Use of Natural Intervening High Ground – Covered Basement Stairs

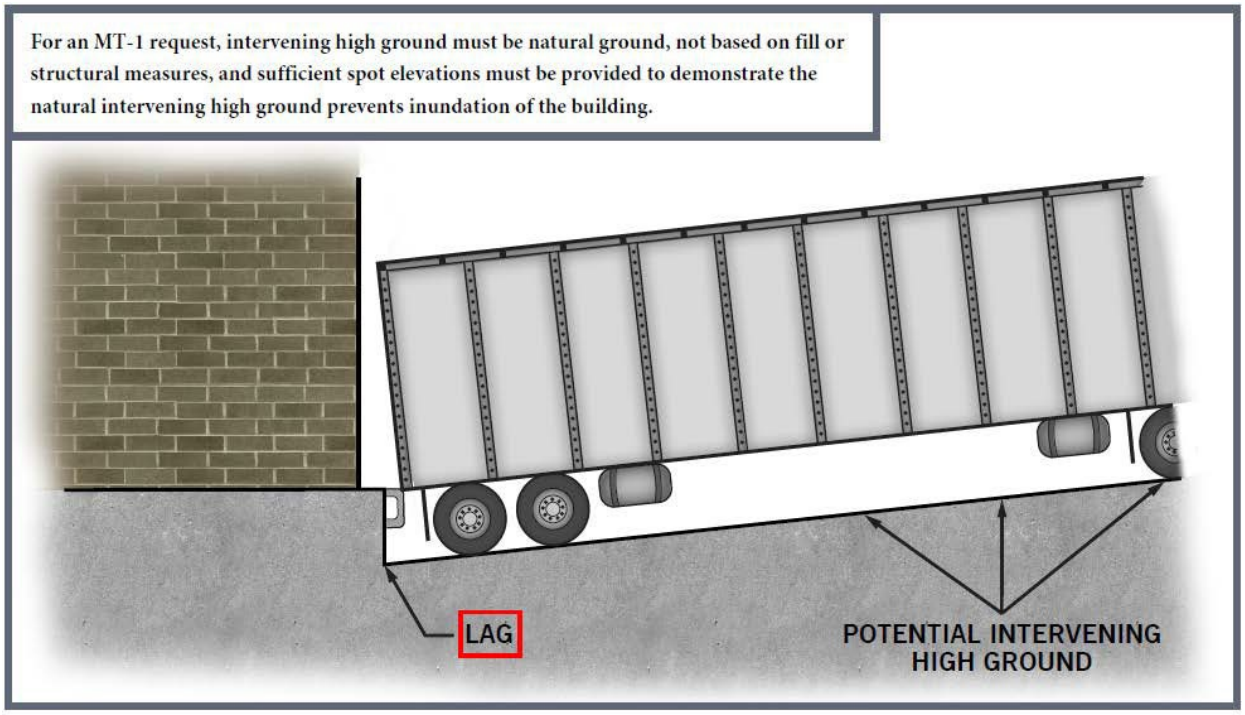


Figure 24: Use of Natural Intervening High Ground – Loading Dock

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 natural 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 can be 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.

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- 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. 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.
- 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 in participating communities 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 NFIP Technical Bulletin 6, titled Requirements for Dry Floodproofed Below-Grade Parking Areas Under Non-Residential and Mixed-Use Buildings.
- 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 NFIP Technical Bulletin 3, titled Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings.

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 review process (LOMR or CLOMR).

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 25). However, specific designs may be subject to an additional FEMA review and could determine a more appropriate location for the LAG.

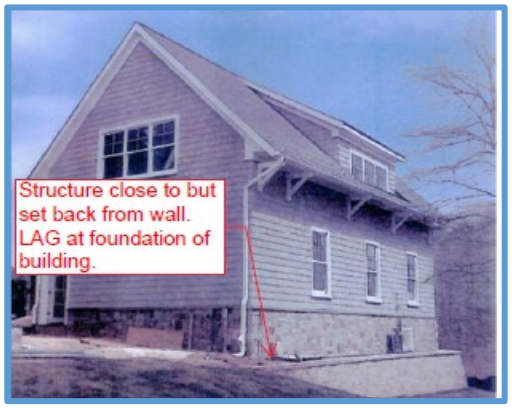


Figure 25: Set Back from Wall

- 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 26). This will normally result in a non-removal determination/comment.

Figure 26: On Top of Wall

- 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 27). 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 27: Not an Acceptable Retrofit Option to Modify the LAG

5. Lidar Letter of Map Amendment

Lidar 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 28 is an example of this type of exhibit.

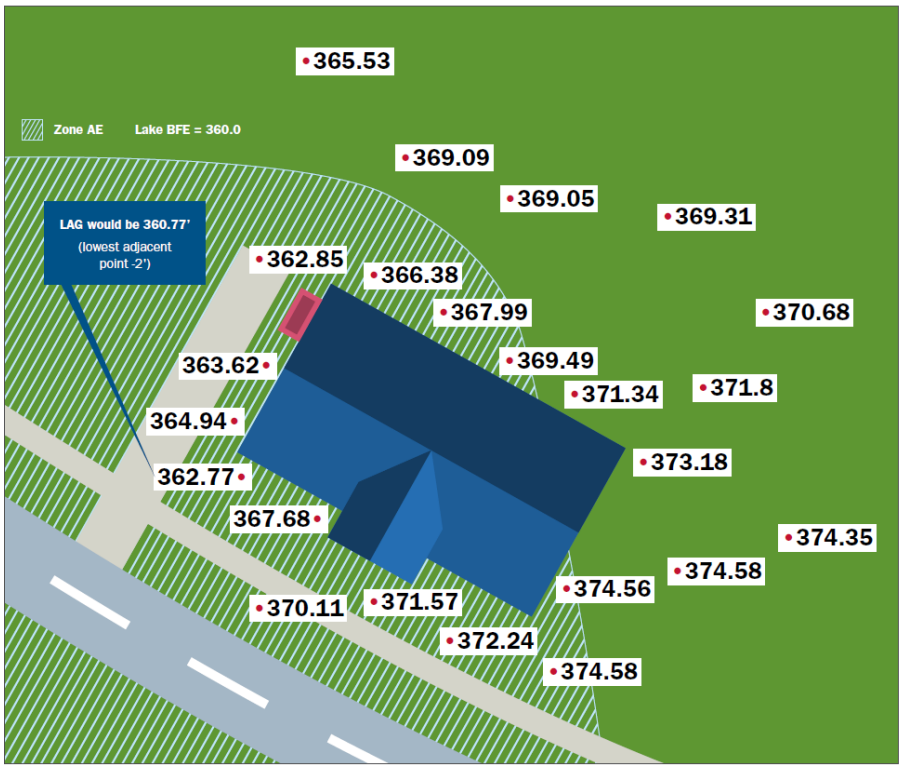


Figure 28: Example of Point Cloud Depiction

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 29) 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.

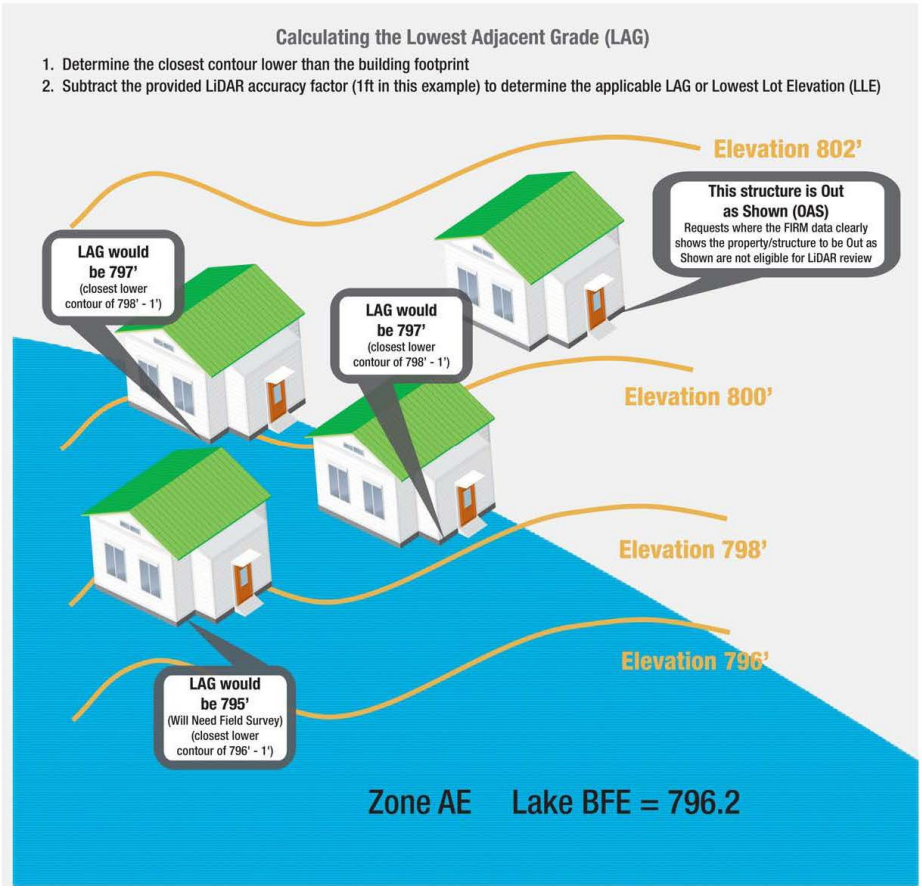


Figure 29: LAG Calculation Examples

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 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% 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% chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE) is the elevation of the flood having a 1% 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 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). Conditional LOMC comments issued by FEMA are NOT permits and should not be considered approval that all local requirements have been met, such as any higher floodplain management standards that have been adopted by many communities. 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.

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.

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.

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% 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 (October 2021)

https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1

MT-EZ Form (June 2012) and Instructions (October 2021)

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

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

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

OVERVIEW

FLOOD HAZARD MAPPING UPDATES

The Federal Emergency Management Agency (FEMA) partners with Tribal nations, States, and communities through the Risk Mapping, Assessment, and Planning (Risk MAP) program to identify flood hazards, assess flood risks, and provide accurate data to guide stakeholders in taking effective mitigation actions that result in safer and more resilient communities. This data is incorporated into flood maps, known as Flood Insurance Rate Maps (FIRMs), that support the National Flood Insurance Program (NFIP) and provide the basis for community floodplain management regulations and flood insurance requirements.

Flood hazards are dynamic and can change frequently because of a variety of factors, including weather patterns, erosion, and new development. FEMA, through the Risk MAP program, works with communities to collect new or updated flood hazard data and periodically updates flood maps to reflect these changes.

What Happens When A Flood Map Changes?

When a new map is issued or an effective map is revised, your mapped flood hazard, as well as building or insurance requirements, may change. An effective map is one that has been through the public review and appeal process and has been adopted as a regulatory FIRM. Therefore, it is important for users to check FEMA's Map Service Center (MSC) or the local community map repository for current, effective information.

What May Affect or Change a Flood Map?

FIRM updates can occur in a variety of ways, including Flood Risk Projects, Physical Map Revisions (PMRs), and Letters of Map Revision (LOMRs). Letters of Map Amendment (LOMAs) and Letters of Map Revision Based on Fill (LOMR-Fs) can change flood hazard designations for specific structures or properties. Each of these processes is discussed in more detail in the table on page 2.

Helpful Flood Map Information

What Goes into a Flood Map, an infographic, is available at http://www.fema.gov/blog/2014-02-21/what-goes-flood-map-infographic.

Mapping Terminology

Flood Insurance Rate Map (FIRM) –
The official flood map that shows a community's different flood hazard areas. These may include high-hazard (Special Flood Hazard Areas), moderate- to low-hazard, and undetermined areas. Different flood insurance and building requirements apply to these flood hazard areas.

Flood Insurance Study (FIS) Report –
A compilation and presentation of flood hazard data and analysis for specific watercourses, lakes, and coastal flood hazard areas within a community.

National Flood Hazard Layer (NFHL) –
A digital database containing the flood hazard mapping information from FEMA's National Flood Insurance Program (NFIP).

Letter of Final Determination (LFD) –
A letter FEMA sends to local officials stating that the process of establishing new flood elevations is complete, and a new or updated FIRM will become effective in 6 months.

Letter of Map Change (LOMC) –
A general term used to refer to the several types of revisions and amendments to FEMA maps that can be accomplished by letter (LOMA, LOMR-F, LOMR).

Map Service Center (MSC) –
FEMA's official public source for flood hazard information produced in support of the NFIP. http://msc.fema.gov

Special Flood Hazard Area (SFHA) –
The area where the NFIP's minimum floodplain management regulations must be enforced by the community as a condition of NFIP participation, and the area where the mandatory flood insurance purchase requirement applies.

Revalidation Letter –
A letter identifying the previously issued LOMCs that are still valid after the FIRM has been revised.

RISK MAPPING, ASSESSMENT, AND PLANNING PROGRAM (RISK MAP)

The Federal Emergency Management Agency's Risk MAP Program delivers quality data that increases public awareness and leads to action to reduce risk to life and property. Risk MAP is a nationwide program that works in collaboration with states, tribes, and local communities using best available science, rigorously vetted standards, and expert analysis to identify risk and promote mitigation action, resulting in safer, more resilient communities.

RiskMAP
Increasing Resilience Together

FEMA

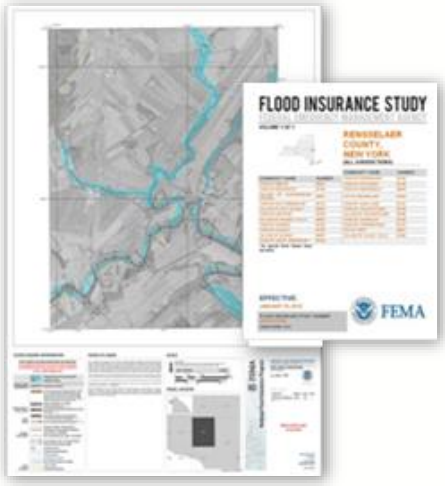
	Flood Risk Project	Physical Map Revision (PMR)	Letter of Map Revision (LOMR)	Letter of Map Revision Based on Fill (LOMR-F)	Letter of Map Amendment (LOMA)
What is it?	Projects implemented under the Risk MAP program to engage with communities and provide flood risk information. Most commonly, these projects are initiated to create new or updated flood maps.	An update to the FIRM to reflect the most current flood hazard data; this results in an update to a portion of a community's map panels.	An official revision to a FIRM that can reflect changes to the floodplains, Base Flood Elevations (BFEs), or regulatory floodways depicted on a community's FIRM. LOMRs most frequently reflect topographic changes and/or construction projects	A letter that provides an official determination on the flood zone for a property or structure that has been elevated by earthen fill to modify the SFHA.	A letter that provides an official determination on the relation of a property or structure to the SFHA. LOMAs are most frequently issued when a property has inadvertently been mapped within the floodplain, but is on naturally high ground.
What is revised?	Revises FIRM panels and FIS reports, or publishes new panels and reports for areas that were not previously mapped.	Physically revises and supersedes at least an entire FIRM panel and the FIS report.	Revises (normally a portion of) an existing FIRM panel (does not supersede the panel) and possibly portions of the FIS report.	Flood hazard designations for properties within an SFHA on a FIRM can be changed, and an effective FIRM can be amended, but the map is not physically changed unless the area is large enough to be reflected in future updates.	
Is there an appeal* period?	Yes, there is a 90-day appeal period for affected communities.		Yes, all LOMRs are subject to a 90-day appeal period when changes to BFEs, floodplain and/or floodway boundaries occur.	No.	
What is the output?	New or updated preliminary FIRM panel(s), LFD, final FIRM panel(s) and FIS report, and LOMC Revalidation Letter.	New or updated FIRM panel(s), FIS report, and LOMC Revalidation Letter.	A LOMR Determination Document that includes a revised area of a FIRM panel(s) and/or revised FIS report (flood profiles).	A LOMR-F Determination Document.	A LOMA Determination Document.
When does it become effective?	Six months after the Letter of Final Determination		A LOMR becomes effective 120 days after the date of the second local newspaper publication is issued, unless an appeal is submitted to FEMA.	On the date of the letter.	
Where to find it?	• Digital copies can be found on the MSC. • Hard copies of community FIRM panels are available at the community's map repository.		• Digital copies can be found on the MSC. • Hard copies are mailed to the applicant and the community's map repository.		
What is uploaded to the MSC?	Map panels, FIS report, and FIRM/NFHL database.	Map panel(s), FIS report, and FIRM/NFHL database.	A determination document, the revised portion of the map panel(s), and updated portions of the FIS report (profiles, tables, etc.) and NFHL database.	A determination document.	
Where can it be found on the MSC?	*On http://msc.fema.gov, after a 'Search for All Products' under a jurisdiction, the paths below will provide the corresponding items.*				
	• Effective and Pending Products> FIRM Panels and FIS Reports	• Effective and Pending Products>FIRM Panels and FIS Reports	• Effective and Pending Products> LOMC> LOMR • Effective Products>FIRM Panels>click on the LOMC Button for a specific panel	• Effective Products>LOMC>LOMA • Effective Products>FIRM Panels>click on LOMC Button for a specific panel	

*Appeal Period Links:

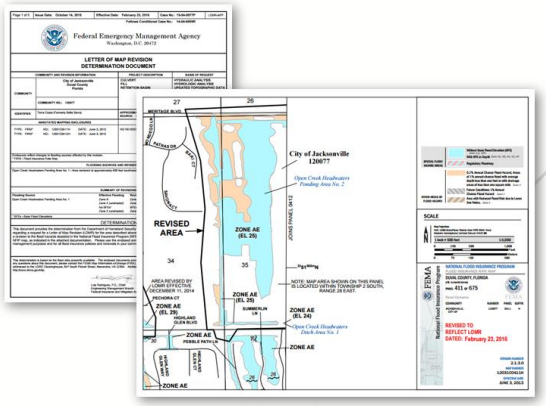
- Criteria for appealing proposed changes in flood hazard information on FIRMs during the appeal period
- Flood Hazard Determination Notices for Preliminary Flood Insurance Studies, Physical Map Revisions, and Letters of Map Revision, including additional information on Flood Hazard Determination Notices and Appeal Periods

Sample Products

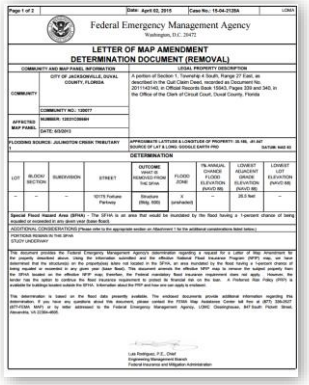
FIRM and FIS report



LOMR



LOMA/LOMR-F



Helpful Links

Flood Risk Projects

- The Risk MAP Project Lifecycle for Flood Risk Projects: https://www.fema.gov/risk-map-flood-risk-project-lifecycle

PMRs and LOMRs

- Flood Map Revision Processes: https://www.fema.gov/flood-map-revision-processes
- Application Information: https://www.fema.gov/mt-2-application-forms-and-instructions

LOMAs and LOMR-Fs

- Letter of Map Amendment and Letter of Map Revision Based on Fill Processes: https://www.fema.gov/letter-map-amendment-letter-map-revision-based-fill-process
- Factsheet: How to Request a LOMA or LOMR-F: https://www.fema.gov/media-library/assets/documents/19871
- Application information: https://www.fema.gov/mt-1-application-forms-instructions
- Revalidation Letters for Letters of Map Change: https://www.fema.gov/media-library-data/20130726-1840-25045-1194/understanding_soma_revalidation_letter.pdf
- Online LOMC: https://www.fema.gov/change-flood-zone-designation-online-letter-map-change

FEMA Map Information eXchange (FMIX)

Contact a Map Specialist

- (877) FEMA MAP (1-877-336-2627)
- Hours of Operation: Monday through Friday, 8 a.m. through 6:30 p.m. eastern standard time (EST)
- Email: FEMAMapSpecialist@riskmapcds.com

Reasonably Safe from Flooding Requirement for Building on Filled Land

Removed From the Special Flood Hazard Area
in Accordance with the National Flood Insurance Program

NFIP Technical Bulletin 10 / March 2023

FEMA

Comments on the Technical Bulletins should be directed to:

Department of Homeland Security / Federal Emergency Management Agency
Federal Insurance and Mitigation Administration (FIMA) Risk Management Directorate
Building Science Branch
400 C Street, S.W., Sixth Floor
Washington, DC 20472-3020

NFIP Technical Bulletin 10 (2023) replaces NFIP Technical Bulletin 10, *Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding* (2001).

All illustrations in this document were created by FEMA or a FEMA contractor unless otherwise noted.

All photographs in this document were taken by FEMA or a FEMA contractor unless otherwise noted.

Cover photo: New development elevated on fill and removed from the floodplain through a Letter of Map Revision based on Fill, Oak Creek, WI. Credit: Korndoerfer Homes

For more information, see the FEMA Building Science Frequently Asked Questions website at https://www.fema.gov/emergency-managers/risk-management/building-science/faq.

If you have any additional questions on FEMA Building Science Publications, contact the helpline at FEMA-Buildingsciencehelp@fema.dhs.gov or 866-927-2104.

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Visit the Building Science Branch of the Risk Management Directorate at FEMA's Federal Insurance and Mitigation Administration at https://www.fema.gov/emergency-managers/risk-management/building-science.

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Additional FEMA documents can be found in the FEMA Media Library at https://www.fema.gov/multimedia-library.

Scan this QR code to visit the FEMA Building Science webpage

Table of Contents

Figures

Tables

Acronyms

ASCE	American Society of Civil Engineers
ASTM	ASTM International
BFE	base flood elevation
CFR	Code of Federal Regulations
CLOMR-F	Conditional Letter of Map Revision Based on Fill
DHS	Department of Homeland Security
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
IBC®	International Building Code®
ICC®	International Code Council®
I-Codes®	International Codes®
IEBC®	International Existing Building Code®
IRC®	International Residential Code®
LiMWA	Limit of Moderate Wave Action
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision Based on Fill
NFIP	National Flood Insurance Program
SFHA	Special Flood Hazard Area

1. Introduction

This Technical Bulletin provides guidance on the National Flood Insurance Program (NFIP) requirements related to determining that buildings constructed on fill will be reasonably safe from flooding during the occurrence of the base flood. Guidance is provided for the placement of fill and the parameters for the design and construction of buildings on filled land that has been removed from the Special Flood Hazard Area (SFHA) through the flood map revision process managed by the Federal Emergency Management Agency (FEMA). The SFHA is identified as Zone A (A, AE, A1-30, AH, AO, A99, and AR) and Zone V (V, VE, V1-30, and VO) on a community's Flood Insurance Rate Map (FIRM) prepared by FEMA. When permitted under applicable federal, state, and local laws, ordinances, and regulations, earthen fill is sometimes placed to reduce flood risk to structures located in Zone A. In Zone V, fill for the purpose of elevating buildings is not permitted, and use of fill for other purposes is limited because fill may obstruct the flow of floodwater and divert waves.

Under certain conditions, when structural fill (also called engineered fill) is placed to raise the surface of the ground to or above the base flood elevation (BFE), property owners and developers may submit requests to FEMA to revise FIRMs to remove filled land from the SFHA (see Figure 1). When a revision is warranted, after reviewing an application, FEMA may revise a FIRM by issuing a Letter of Map Revision Based on Fill (LOMR-F). The NFIP requirements include, as part of the LOMR-F application, that written assurance from the participating community include a determination that the site (filled area) and any existing, proposed or future development (buildings and structures on the filled land) to be removed from the SFHA are or will be "reasonably safe from flooding" as defined in Title 44 of the Code of Federal Regulations (CFR) Part 65, Identification and Mapping of Special Flood Hazard Areas (see Section 2 of this Technical Bulletin).

NFIP Technical Bulletin 0

NFIP Technical Bulletin 0, *User's Guide to Technical Bulletins*, should be used as a reference with this Technical Bulletin. Technical Bulletin 0 describes the purpose and use of the Technical Bulletins. It includes common concepts and terms, lists useful resources, and includes a crosswalk of the NFIP regulations by section and the applicable Technical Bulletin, as well as a subject index.

Readers are cautioned that the definitions of some of the terms that are used in the Technical Bulletins are not the same when used by the NFIP for the purpose of rating flood insurance policies.

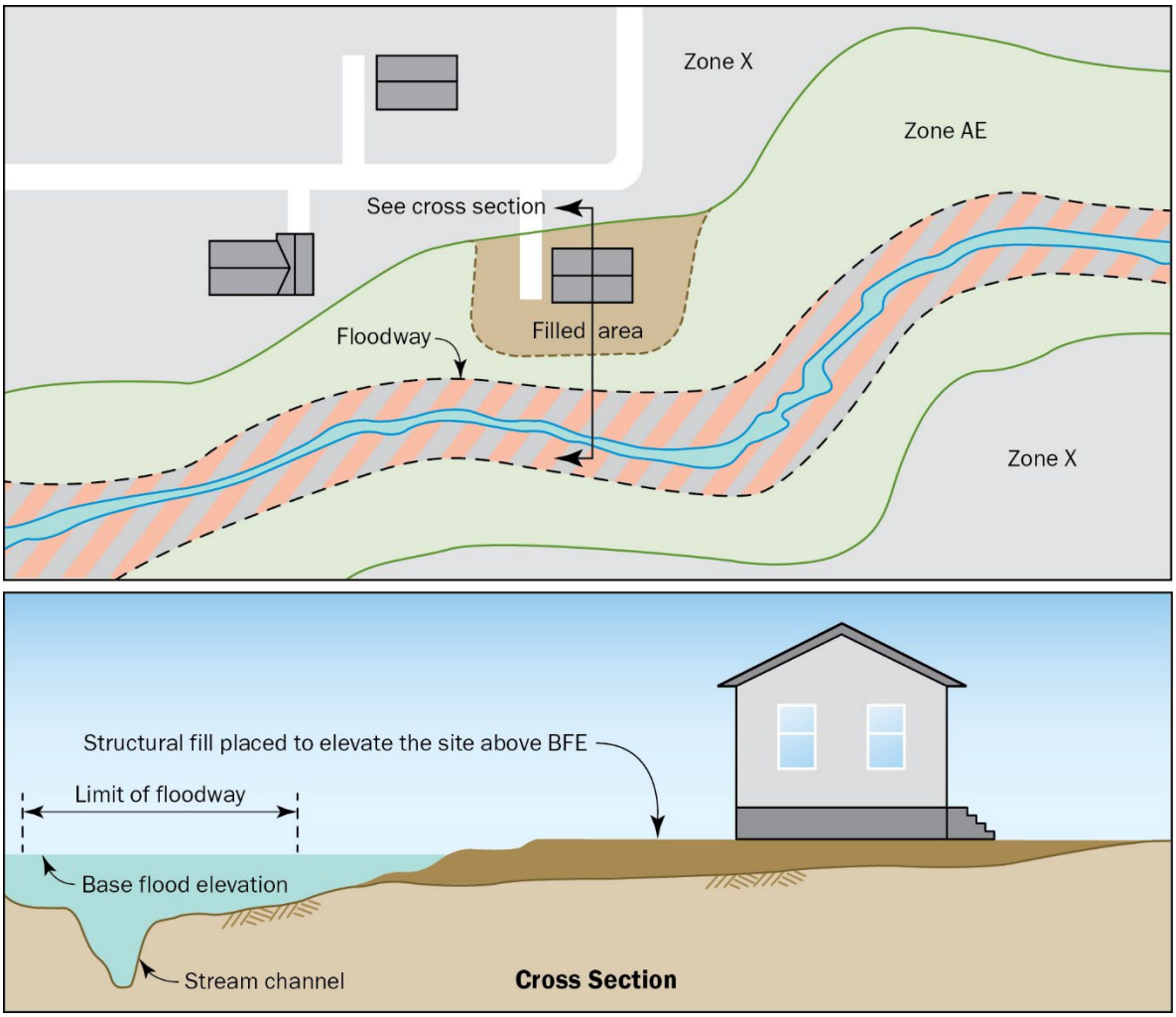


Figure 1: Building on site elevated by fill

1.1. History and Update of Technical Bulletin 10

In 2001, FEMA revised the NFIP regulations and the Letter of Map Revision (LOMR) and LOMR-F procedures, including the addition of the reasonably safe from flooding requirements to address concerns regarding the inconsistent and potentially hazardous practice of constructing on land removed from the SFHA. The additional requirements emphasized the long-standing requirement that NFIP communities must review all permit applications to determine whether proposed building sites will be reasonably safe from flooding [44 CFR 60.3(a)(3)]. FEMA issued the first edition of this Technical Bulletin in 2001 to provide guidance on how to make the determination that an area is reasonably safe from flooding. This updated Technical Bulletin reorganizes and clarifies the previous guidance but does not change any requirements or design approaches.

1.2. Letter of Map Revision Based on Fill

When fill has been placed **and a property owner wishes to have a structure or property removed from the SFHA**, the owner must submit a map revision request to FEMA for consideration. When fill is

proposed but not yet placed, a Conditional Letter of Map Revision Based on Fill (CLOMR-F) can be requested from FEMA. A CLOMR-F is used to request FEMA's comments on a proposed project; it does not revise a FIRM and is not a permit or approval to perform the proposed filling. When FEMA approves a CLOMR-F, a subsequent as-built LOMR-F must be requested after construction before FEMA will officially revise the FIRM to remove the land from the SFHA. The FEMA MT-1 application is used to support a request for a LOMR-F or CLOMR-F. The application includes a Property Information Form (Form 1), Elevation Form (Form 2), and Community Acknowledgement Form (Form 3). By signing the Community Acknowledgement Form, the local official responsible for floodplain management in the community is acknowledging that they have reviewed the LOMR-F request and asserting that the project is reasonably safe from flooding. Additional guidance on the MT-1 application and supporting documentation to make this assertion is provided in this Technical Bulletin.

Performing Work After a CLOMR-F

If the scope of an as-built LOMR-F follow up to an approved CLOMR-F differs from the approved CLOMR-F, the LOMR-F application may be reviewed as a brand new application and may not result in an approval. Additionally, if the review determines that the as-built project is in violation of the floodplain management regulations, a potential violation memorandum may be issued by FEMA to the community.

1.3. Residual Risks

Constructing a building to the minimum NFIP requirements—or constructing a building on land adjacent to the SFHA—is no guarantee the building will be undamaged by flooding. To make informed decisions during planning, siting, and design of buildings, owners, design professionals, and local officials should understand the following:

- FIRMs are based on modeling of the best available topographic, hydrologic, hydraulic, and climate conditions data at the time of the Flood Insurance Study (FIS). There are inherent uncertainties in the modeling and analyses of BFEs and delineation of flood hazard zones. Some FIRMs, particularly older FIRMs, may no longer reasonably reflect the land characteristics and actual flood risk during base flood events. Current effective FIRMs do not convey the potential impacts of future conditions.

- Floods can and do exceed the BFE and can extend beyond the SFHA delineated on FIRMs. During notable flood events such as Hurricane Sandy in 2012, riverine flooding in Louisiana in 2017, and Hurricane Michael in 2018, flood elevations exceeded the BFEs by several feet in some areas and extended far beyond the SFHAs shown on the effective FIRMs.

- NFIP flood insurance premiums based on current flood modeling data and methodologies may change in the future if revised or newly acquired flood data indicate different flood risk.

Residual Risks

Residual risks associated with flooding may exist in areas elevated above the BFE by the placement of structural fill. Residual risks in these areas include subsurface flooding caused by saturated soils and surface flooding that exceeds base flood conditions.

Areas adjacent to SFHAs may have residual risks of flood damage like areas removed from SFHAs by the placement of fill. The guidance in Sections 8 and 9 of this Technical Bulletin should also be used when buildings with basements are constructed in areas adjacent to SFHAs.

1.4. Guidance in Technical Bulletin 10

This Technical Bulletin includes guidance on:

- NFIP regulations related to determining that buildings constructed on fill will be reasonably safe from flooding during the occurrence of the base flood (see Section 2 of this Technical Bulletin).
- Building codes and standards provisions related to the placement of fill in SFHAs (see Section 3 of this Technical Bulletin).
- NFIP flood insurance for buildings on land removed from SFHAs through the LOMR-F process (see Section 4 of this Technical Bulletin).
- Documentation and certification requirements to determine that buildings constructed on fill are reasonably safe from flooding (see Section 5 of this Technical Bulletin).
- Best practices for administrative procedures and more restrictive, higher regulatory standards (see Section 6 of this Technical Bulletin).
- Proper design and placement of fill (see Section 7 of this Technical Bulletin).
- Several types of foundations that are used for buildings on fill and the residual risk associated with non-basement foundations (see Section 8.1 of this Technical Bulletin) and basement foundations (see Section 8.2 of this Technical Bulletin).

Technical approaches to analyzing seepage into basements constructed into fill to satisfy the requirement that buildings on fill with basements are reasonably safe from flooding (see Section 9 of this Technical Bulletin).

Best Practice: Avoid Basements Below BFE

In some parts of the country, basements are a standard construction feature. Some owners may wish to construct basements into filled land after the site is removed from the SFHA. Buildings with basements have a higher risk of damage caused by subsurface flooding compared to buildings built on foundations that do not have below-grade areas. As a best practice to minimize risk of future flooding during base flood conditions, FEMA recommends that buildings constructed on land officially removed from SFHAs by issuance of LOMR-Fs be designed with the lowest floor (including basement) at or above the elevation of the BFE associated with the adjacent SFHA. Any basement with the lowest floor below the elevation of the BFE associated with the adjacent SFHA should only be used for parking of vehicles, building access, or storage, and not as living space.

This Technical Bulletin **does not apply** to situations in which other requirements or restrictions apply, including the following:

- Construction and filling in floodways with an increase in flood levels. The NFIP regulations prohibit encroachments in floodways that would result in an increase in flood levels [44 CFR § 60.3(d)(3)]. The LOMR-F process (MT-1) cannot be used for requests involving property and/or structures that have been elevated by fill placed within the regulatory floodway [44 CFR § 65.5(a)]. All Letter of Map Change requests involving the placement of fill in floodways must go through the CLOMR and LOMR processes using the MT-2 application [44 CFR § 65.7].

  This Technical Bulletin applies to proposed fill or grading in the floodway, and the CLOMR application review determines that the proposed encroachment will not result in any increase in flood levels. The community must ensure that the fill and any structures built or proposed in the filled area will be reasonably safe from flooding [44 CFR § 65.6(a)(14)].

- Construction in Coastal High Hazard Areas (Zone V). The NFIP regulations prohibit the use of structural fill for support of buildings in Coastal High Hazard Areas [44 CFR § 60.3(e)(6)]. While nonstructural fill for landscaping and drainage may be placed in Zone V, fill for those purposes does not qualify for a map revision. The LOMR-F process is not used to determine the acceptability of the placement of fill in Zone V [44 CFR § 65.5(a)].

- Construction in SFHAs subject to alluvial fan flooding, which are typically designated on FIRMs as Zone AO with depths and velocities [44 CFR § 65.13(b)]. Elevating a parcel of land or a structure by fill or other means will not serve as a basis for removing areas subject to alluvial fan flooding from the SFHA. Revision requests involving alluvial fans will only be considered through the LOMR (MT-2) process if a structural flood control measure is designed and/or constructed to provide protection against the base flood in compliance with 44 CFR § 65.13.

- Placement of fill around an existing residential or non-residential building where the lowest floor is below the BFE with the intent of changing the lowest adjacent grade to remove the building from the SFHA.

- Analysis of an existing residential or non-residential building with a basement that has its lowest floor below the BFE with the intent of using the analysis to determine that a building is "reasonably safe from flooding" in order to obtain a LOMR-F. Basements excavated into fill with the basement floor below the BFE are prohibited unless the land has been removed from the SFHA through the LOMR-F process prior to construction or the building is in an approved basement exception community.[1] In addition, post-construction testing to confirm geotechnical conditions beneath the building would likely involve testing that is destructive to the building.

Questions about requirements for placement of fill in SFHAs and LOMR-Fs should be directed to the appropriate local official, NFIP State Coordinating Office, or FEMA Regional Office.

Terms Used in This Technical Bulletin

Basement: "Any area of a building having its floor subgrade (below ground level) on all sides" (44 CFR § 59.1). The NFIP regulations do not allow basements to extend below the base flood elevation (BFE) except in dry-floodproofed, non-residential buildings.

Fill or earthen fill: Material from any source, such as soil, gravel, or crushed stone, that is placed to increase or raise ground elevations to or above the BFE.

Conditional Letter of Map Revision Based on Fill (CLOMR-F): An official letter issued by FEMA stating that a parcel of land or proposed structure that will be elevated by fill would not be inundated by the base flood if the fill is placed on the parcel as proposed or the structure is built as proposed. A CLOMR-F provides comment on the proposed plan and does not revise or amend the Flood Insurance Rate Map (FIRM).

Development: "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 operation or storage of equipment or materials" (44 CFR § 59.1).

Existing (Non NFIP definition): As used in this Technical Bulletin, existing building or existing fill refers to buildings or fill where construction or placement occurred prior to the date of the preparation of LOMR-F or LOMR application.

[1] Approximately 50 NFIP communities have obtained an exception from FEMA to allow residential buildings with floodproofed basements below the BFE (https://www.fema.gov/floodplain-management/manage-risk/residential-buildings-basements). This Technical Bulletin does not address the dry floodproofing requirements for basements in excepted communities [44 CFR § 60.6(b) or (c)].

Terms Used in This Technical Bulletin (continued)

Land removed from SFHA by placement of fill: Land that has been elevated by fill where an official determination (LOMR-F) has been issued by FEMA that the parcel of land will not be inundated by the base flood and the site or parcel is subsequently designated as being outside the SFHA.

Letter of Map Revision Based on Fill (LOMR-F): An official determination (letter) issued by FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood. A LOMR-F revises the FIRM by designating filled land as being removed from the SFHA.

Reasonably safe from flooding: "Base flood waters will not inundate the land or damage structures to be removed from the SFHA and any subsurface waters related to the base flood will not damage existing or proposed buildings or structures" [44 CFR § 65.2(c)].

Special Flood Hazard Area (SFHA): Area subject to flooding by the base flood (1-%-annual-chance flood) and shown on FIRMs as Zones A or V.

Structural fill or engineered fill: Fill placed and compacted to a specified density to provide structural support or protection for buildings and structures as authorized by local officials.

Zone A: Flood zones shown on FIRMs as Zone A, AE, A1-30, AH, AO, A99, and AR.

Zone V: Flood zones shown on FIRMs as Zone V, VE, V1-30, and VO; also known as the Coastal High Hazard Area.

Other terms in this Technical Bulletin are defined in a glossary in Technical Bulletin 0.

2. National Flood Insurance Program Regulations

An important NFIP objective is protecting buildings constructed in SFHAs from damage caused by flooding. The SFHA is the land area subject to flooding by the base flood. SFHAs are shown on FIRMs prepared by FEMA as Zones A and V. The base flood is the flood that has a 1 % chance of being equaled or exceeded in any given year (commonly called the "100-year" flood). The NFIP floodplain management regulations include minimum building design criteria that apply to:

- New construction
- Work determined to be substantial improvements, including improvements, alterations, and additions
- Repair of buildings determined to have incurred substantial damage

The NFIP regulations for development in SFHAs, including filling, grading, excavation, and buildings and structures, are codified in 44 CFR Part 60, Criteria for Land Management and Use.

Section 59.1 defines "development" to mean (emphasis added):

> *… 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 operation or storage of equipment or materials.*

The NFIP regulations for identification and mapping of SFHAs are set forth in 44 CFR Part 65, Identification and Mapping of Special Hazard Areas. Specific to revisions to SFHAs in accordance with the FEMA map revision process, Section 65.2(c) defines "reasonably safe from flooding" to mean:

> *… base flood waters will not inundate the land or damage structures to be removed from the SFHA and that any subsurface waters related to the base flood will not damage existing or proposed buildings.*

Section 60.3(a)(3) states that a community shall (emphasis added):

> *Review **all permit applications** to determine whether the proposed building sites will be **reasonably safe from flooding**. If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall … [meet specific listed performance requirements]*

Section 60.3(a)(4) states that a community shall (emphasis added):

> *Review subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be **reasonably safe from flooding**.*

When property owners submit requests to FEMA for map revisions that involve topographic changes by placement of engineered earthen fill (structural fill) but that do not change BFEs, Section 65.5(a)(4)(ii) requires that the request include written assurance from the community that they have (emphasis added):

> *… determined that the land and any existing or proposed structures removed from the SFHA are **"reasonably safe from flooding,"** and that they have on file, available upon request by FEMA, all supporting analyses and documentation used to make that determination.*

When property owners submit requests to FEMA for map revisions, including those that involve the placement of fill in floodways, that result in changes to BFEs, Section 65.6(a)(14)(ii) requires that the request include written assurance from the community that they have (emphasis added):

> *… determined that the land and any existing or proposed structures to be removed from the SFHA are **"reasonably safe from flooding,"** and that they have on file, available upon request by FEMA, all supporting analyses and documentation used to make that determination.*

When a regulatory floodway has not been identified, communities must review permit applications to evaluate cumulative effects of proposed development as specified in Section 60.3(c)(10):

> *Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.*

NFIP Requirements and More Restrictive Regulatory Standards

Federal, State, and Local Requirements. Federal, state, or local requirements that are more restrictive or stringent than the minimum requirements of the NFIP take precedence. The Technical Bulletins and other FEMA publications provide guidance on the minimum requirements of the NFIP and describe best practices. Design professionals, builders, and property owners should contact local officials to determine whether more restrictive provisions apply to buildings or sites in question. All other applicable requirements of state or local building codes must also be met for buildings in flood hazard areas.

Substantial Improvement and Substantial Damage. As part of issuing permits, local officials must review not only proposals for new construction but also for work on existing and legal non-conforming buildings to determine whether the work constitutes substantial improvement or repair of substantial damage. If the work is determined to constitute substantial improvement or repair of substantial damage, the buildings must be brought into compliance with NFIP requirements for new construction. Some communities modify the definitions of substantial improvement and/or substantial damage to be more restrictive than the NFIP minimum requirements. For more information on substantial improvement and substantial damage, see FEMA P-758, *Substantial Improvement/Substantial Damage Desk Reference* (2010), and FEMA 213, *Answers to Questions About Substantially Improved/Substantially Damaged Buildings* (2018).

Elevation Above Minimum NFIP Requirements. Some states and communities require that buildings be elevated above the NFIP minimum requirement. The additional elevation is called freeboard. Design professionals, builders, and property owners should check with local officials to determine whether a community has freeboard requirements. References to building elevations in this Technical Bulletin should be construed as references to the community's elevation requirement where freeboard is required.

3. Building Codes and Standards

In addition to complying with NFIP requirements, all new construction, substantial improvements, and repair of substantial damage must comply with applicable building codes and standards that are adopted and enforced by states and communities.

The International Codes® (I-Codes®), published by the International Code Council® (ICC®), are a family of codes that includes the International Residential Code® (IRC®), International Building Code® (IBC®), International Existing Building Code® (IEBC®), and codes that govern the installation of mechanical, plumbing, fuel gas, and other aspects of building construction. FEMA has deemed that the latest published editions of the I-Codes generally meet or exceed NFIP requirements for buildings and structures. Excerpts of the flood provisions of the I-Codes are available on the FEMA Building Code webpage at https://www.fema.gov/emergency-managers/risk-management/building-science/building-codes.

3.1. International Residential Code

The International Residential Code (IRC) applies to one- and two-family dwellings and townhomes not more than three stories above grade plane.

International Residential Code Commentary

The ICC publishes companion commentary for the IRC. Although not regulatory, the commentary provides guidance that is useful in complying with, interpreting, and enforcing the requirements of the code.

Table 1 summarizes the 2021 IRC requirements related to fill in flood hazard areas, notes changes from the 2015 and 2018 editions, and compares the IRC provisions to the NFIP requirements. Subsequent editions of the IRC should include comparable requirements.

Table 1: Comparison of Selected 2021 IRC Requirements with NFIP Requirements

Topic	Summary of Selected 2021 IRC Requirements and Changes from 2015 and 2018 Editions	Comparison with NFIP Requirements
Fill supporting foundations and nonstructural fill (Zone V and Coastal A Zones)	**Section R322.3.2 [Coastal high-hazard areas (including V Zones and Coastal A Zones, where designated)] Elevation requirements.** Prohibits the use of fill for structural support. Allows minor quantities of nonstructural fill for grading, landscaping, drainage, and to support parking slabs, pool decks, patios, and walkways. Change from 2018 to 2021: No change. Change from 2015 to 2018: No change.	Equivalent to NFIP 44 CFR § 60.3(e)(6) in Zone V and exceeds NFIP by prohibiting structural fill in Coastal A Zones. More specific than NFIP by specifying allowed uses of nonstructural fill.

Topic	Summary of Selected 2021 IRC Requirements and Changes from 2015 and 2018 Editions	Comparison with NFIP Requirements
Fill supporting foundations (in and out of FHA)	**Section R401.2 [Foundations] Requirements.** Requires fill soils supporting foundations to be designed, installed, and tested in accordance with accepted engineering practice. **Section R506.2.1 [Concrete Floors (on Ground)] Fill.** Requires fill material to be free of vegetation and foreign material and compacted to ensure support of slabs. Unless otherwise approved, specific maximum fill depths apply. Change from 2018 to 2021: No change. Change from 2015 to 2018: No change.	Equivalent to NFIP 44 CFR § 60.3(a)(3)(i) requirements for stability, with specific requirements for design, placement, content, and compaction of fill.
Site drainage (in and out of FHA)	**Section R401.3 [Foundations] Drainage.** Requires surface drainage to be diverted away from foundation walls to a collection point and specifies a minimum grade of 6 inches of fall within the first 10 feet, with exceptions. Change from 2018 to 2021: No change. Change from 2015 to 2018: No change.	Exceeds NFIP 44 CFR § 60.3(c)(11) by requiring drainage away from all dwellings, instead of only those in Zone AO and Zone AH, and by specifying minimum slopes for drainage.
Foundations (in and out of FHA)	**Section R404 Foundations and Retaining Walls.** Requires concrete and masonry foundation walls to be designed in accordance with accepted engineering practice where walls are subject to hydrostatic pressure from groundwater or where walls supporting more than 48 inches of unbalanced backfill do not have permanent lateral support. Foundation requirements are based on height of unbalanced backfill. **Section R405 Foundation Drainage.** Specifies requirements for foundation drainage for foundations that enclose habitable or usable space located below grade based on foundation material. **Section R406 Foundation Waterproofing and Dampproofing.** Specifies requirements for waterproofing and dampproofing of interior spaces and floors below grade based on foundation material. Change from 2018 to 2021: Requirements in Section R404 based on maximum unsupported wall height rather than maximum wall height. Change from 2015 to 2018: No significant changes.	Equivalent to NFIP 44 CFR § 60.3(a)(3)(i) requirements for stability, with specific requirements for foundation design. Equivalent to 44 CFR § 60.3(a)(3)(iii) with specific requirements for drainage and waterproofing.

3.2. International Building Code and ASCE 24

The International Building Code (IBC) applies to all applicable buildings and structures. While used primarily for buildings and structures other than dwellings within the scope of the IRC, the IBC may also be used to design dwellings.

The flood provisions of the latest published editions of the IBC generally meet or exceed NFIP requirements for buildings through reference to the standard ASCE 24, *Flood Resistant Design and Construction*. ASCE 24 is developed by the American Society of Civil Engineers (ASCE) and applies to structures that are subject to building code requirements.

International Building Code and ASCE 24 Commentaries

The ICC publishes companion commentary for the IBC, and ASCE publishes companion commentary for ASCE 24. Although not regulatory, the commentaries provide information and guidance that are useful in complying with, interpreting, and enforcing requirements of the code.

Table 2 summarizes the 2021 IBC and ASCE 24-14 requirements related to fill in flood hazard areas, notes changes from 2015 and 2018 IBC editions, and compares those provisions to the NFIP requirements. Subsequent editions of the IBC and ASCE 24 should include comparable requirements.

Table 2: Comparison of Selected 2021 IBC and ASCE 24-14 Requirements with NFIP Requirements

Topic	Summary of Selected 2021 IBC / ASCE 24-14 Requirements and Changes from 2015 and 2018 IBC	Comparison with NFIP Requirements
Testing of site soils and fill (in and out of FHA)	**IBC Section 1705.6 [Required Special Inspections and Tests] Soils.** Requires special inspections and tests of existing site soil conditions, fill placement, and load-bearing requirements, including continuous inspection of fill density and lift thickness during fill placement. Change from 2018 to 2021 IBC: Added specificity to fill inspection. Change from 2015 to 2018 IBC: No change.	Exceeds NFIP by requiring inspections and testing during placement of fill.

Topic	Summary of Selected 2021 IBC / ASCE 24-14 Requirements and Changes from 2015 and 2018 IBC	Comparison with NFIP Requirements
Soils and foundations (in and out of FHA)	**IBC Chapter 18 Soils and Foundations.** Specifies requirements for geotechnical investigations (Sec. 1803); excavation, grading, and fill (Sec. 1804); dampproofing and waterproofing (Sec. 1805); and unsupported height of backfilled foundation walls (Sec. 1807). Change from 2018 to 2021 IBC: No significant changes. Change from 2015 to 2018 IBC: See "Site grading" in this table.	Equivalent to NFIP 44 CFR § 60.3(a)(3)(i) requirements for stability, with specific requirements for foundation design. Equivalent to NFIP 44 CFR § 60.3(a)(3)(iii) with specific requirements for drainage and waterproofing.
Site grading (in and out of FHA)	**IBC Section 1804.4 [Excavation, Grading and Fill] Site grading.** Requires ground to be sloped away from foundations at a minimum 5% slope, with exceptions. Change from 2018 to 2021 IBC: No change. Change from 2015 to 2018 IBC: Added exception for certain door landings and ramps.	Exceeds NFIP 44 CFR § 60.3(c)(11) by requiring drainage away from all buildings, instead of only those in Zone AO and Zone AH, and by specifying minimum slopes for drainage.
Fill (in FHA)	**IBC Section 1804.5 [Excavation, Grading and Fill] Grading and fill in flood hazard areas.** Requires fill to be placed, compacted, and sloped to minimize shifting, slumping, and erosion during the rise and fall of floodwater and, as applicable, wave action. Prohibits fill in floodways unless analysis shows the fill will not cause any increase in flood levels. Prohibits fill in coastal high hazard areas unless fill is placed to avoid diverting water and waves toward buildings. [See "Fill in Zone V and Coastal A Zones" in this table] Change from 2018 to 2021 IBC: No change. Change from 2015 to 2018 IBC: No change.	Equivalent to NFIP 44 CFR § 60.3(a)(3)(i) with more specific requirements for performance under flood conditions. Equivalent to NFIP 44 CFR § 60.3(c)(10) and § 60.3(d)(3) floodway encroachment requirements. Equivalent to NFIP 44 CFR § 60.3(e)(6) prohibiting structural fill in Zone V.

Topic	Summary of Selected 2021 IBC / ASCE 24-14 Requirements and Changes from 2015 and 2018 IBC	Comparison with NFIP Requirements
Definition of fill	**ASCE 24 Section 1.2 Definitions.** Defines fill as "material such as soil, gravel, or crushed stone that is placed in an area to increase ground elevations." Defines structural fill as "fill placed and compacted to a specified density to provide structural support or protection to a structure."	Exceeds NFIP 44 CFR § 59.1 by defining fill and structural fill.
Geotechnical considerations and stability of fill (in all FHA)	**ASCE 24 Section 1.5.3.1 Geotechnical Considerations.** Requires foundation designs to be based on geotechnical characteristics of the soils and strata below the structure. **ASCE 24 Section 1.5.4 Use of Fill.** Requires fill to be stable under flood conditions, including rapid rise and rapid drawdown of floodwaters, prolonged inundation, and flood-related erosion and scour.	Equivalent to NFIP 44 CFR § 60.3(a)(3)(i) requirements for stability, with more specific requirements for performance under flood conditions.
Fill in floodways	**ASCE 24 Section 2.2 Development in Floodways.** Prohibits fill in floodways unless analysis shows the fill will not cause any increase in flood levels.	Equivalent to NFIP 44 CFR § 60.3(d)(3) and § 60.3(c)(10) floodway encroachment requirements.
Fill in Zone A	**ASCE 24 Section 2.4.1 Structural Fill.** In flood hazard areas other than Coastal High Hazard Areas and Coastal A Zones (i.e., in Zone A), permits structural fill if designed to account for soil consolidation and settlement, slope stability, and erosion control. Specifies maximum 12-inch lifts, compaction densities, and maximum side slope ratio of 1:1.5.	Equivalent to NFIP 44 CFR § 60.3(a)(3)(i) requirements for stability, with specific requirements for design, placement, content, and compaction of fill.
Fill in Zone V and Coastal A Zones	**ASCE 24 Section 4.5.4 Use of Fill.** Prohibits structural fill in Coastal High Hazard Areas and Coastal A Zones. Allows nonstructural fill for minimal site grading, landscaping, local drainage, and limited dune construction/reconstruction.	Equivalent to NFIP 44 CFR § 60.3(e)(6) in Zone V and exceeds by requiring prohibition in Coastal A Zones. More specific than NFIP by specifying allowed uses of nonstructural fill.

4. NFIP Flood Insurance Implications

NFIP flood insurance coverage is available for all eligible buildings in participating communities, including buildings located outside the SFHA. NFIP flood insurance rates are based on several flood risk factors, such as distance and elevation relative to flooding sources, first floor height above grade, building occupancy (residential, non-residential, other residential), foundation type, number of floors, and whether a basement or enclosure is below elevated buildings. In general, buildings with basements will have a higher premium due to an increase in risk than buildings on other foundation types if all other rating variables are the same.

The purchase of flood insurance is mandatory for federally backed mortgages on buildings in SFHAs in NFIP participating communities. The mandatory purchase requirement does not apply after FEMA officially removes filled land from the SFHA through the LOMR-F process. However, removal of filled land from the SFHA does not mean all risk of flooding is eliminated. Historically, approximately 25% of all claims paid by the NFIP have been for buildings located outside 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. FEMA encourages property owners and tenants to purchase flood insurance even when not required by mortgage lenders.

Designers, builders, and owners may wish to contact a qualified insurance agent or carrier with flood insurance experience for more information about policy coverage, coverage limits, and premium costs.

5. Documentation and Certification Requirements

Communities that participate in the NFIP are required to make a determination that applications for development in SFHAs comply with local floodplain management regulations. Permit applicants submit site plans, building plans, required documentation, analyses, and certifications. Local officials are responsible for reviewing applications for compliance.

To request a LOMR-F or CLOMR-F, permit applicants must prepare the MT-1 application forms, which help applicants gather the information that FEMA needs to determine whether the land or structures are likely to be flooded during a base flood event. The MT-1 application forms include a Community Acknowledgement Form to be signed by the local official responsible for floodplain management (Section 5.1 of this Technical Bulletin). To support the application review, local officials typically require permit applicants to submit supporting documentation, including a signed statement or certificate that the filled land and existing or proposed structures are or will be reasonably safe from flooding (Section 5.2 of this Technical Bulletin). At minimum, permit applicants must submit professionally certified elevation information (Section 5.3 of this Technical Bulletin).

Only FEMA can revise or amend FIRMs by issuing Letters of Map Change, including LOMR-Fs. Although a local official may conclude that a proposal to fill land is reasonably safe from flooding, the filled area must continue to be regulated as an SFHA until and unless FEMA issues a LOMR-F for the project. When fill is proposed but not yet placed, a CLOMR-F should be requested. A CLOMR-F does

not revise the FIRM, nor does it suggest that FEMA has determined that the proposed building on fill will be reasonably safe from flooding. Therefore, issuance of a LOMR-F subsequent to an approved CLOMR-F to remove a building built in the SFHA with the lowest floor below the BFE is not guaranteed. To revise the FIRM, after construction is completed, the property owner must submit a subsequent LOMR-F application to document the as-built conditions. A basement with the basement floor below the BFE must not be excavated into fill where only a CLOMR-F has been issued, unless the building is in an approved basement exception community.

Local Permits Required

Communities that participate in the NFIP are responsible for regulating development in SFHAs by requiring and reviewing permit applications for compliance and issuing permits when in compliance with the permit requirements. Submission of an MT-1 application to FEMA is not an application for a permit, and FEMA's issuance of a LOMR-F or CLOMR-F is not authorization to perform the work described in the MT-1 application.

5.1. Community Acknowledgement Form (Signed by Local Official)

Property owners and developers seeking LOMR-Fs and CLOMR-Fs must ask local officials to sign the MT-1 Community Acknowledgement Form (Form 3). The Community Acknowledgement Form statement for requests involving the placement of fill includes the following:

> *As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. … In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44 CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.*

Environmental Compliance

In some areas, the placement of fill has been identified as a contributor to loss of habitat critical to endangered species. The Community Acknowledgement Form includes a statement about meeting the federal Endangered Species Act (ESA) requirements. Documentation of compliance with the ESA requirements is required to be submitted to FEMA prior to issuance of a CLOMR-F, or the local official must acknowledge that the ESA requirements were complied with independently of the FEMA process for LOMR-F requests. In addition, the local official must acknowledge that all necessary federal, state, and local permits have been or will be obtained, which may include environmental impacts such as wetlands development permits or local tree removal permits.

In order to complete the Community Acknowledgment Form, the local official must review the MT-1 application and accompanying documentation. If the local official can attest that the applicant has met or will meet the local floodplain management requirements including that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding, the local official should sign the Community Acknowledgement Form. If the local official is unable to sign the statement, for example if a proposal does not meet local requirements, the applicant's supporting documentation is insufficient to make a reasonably safe from flooding determination, or the local official concludes that a structure on filled land is not, or will not be, reasonably safe from flooding, the local official should not sign the Community Acknowledgement Form. MT-1 applications submitted for CLOMR-Fs/LOMR-Fs without the local official's signed Community Acknowledgement Form are incomplete and FEMA will suspend processing of the request. The permit applicant can then work with the local official to modify the project or submit additional documentation to achieve compliance.

5.2. Reasonably Safe from Flooding Documentation (Signed by Design Professional)

Local officials who have the authority to make determinations as to whether filled sites are reasonably safe from flooding should require permit applicants to submit appropriate information such as that described in this Technical Bulletin to review and to make the determination. A common practice is to require a signed statement or certificate by a qualified design professional to indicate that all land and existing or proposed structures to be removed from the SFHA, are or will be reasonably safe from flooding, according to the criteria described in this Technical Bulletin. An example certificate is shown in Figure 2.

NFIP Community Identification Number and Name

Project Name and Location (address, parcel number, lot and plat)

I, _____ certify that the plans and design for the aforementioned development is reasonably safe from flooding in accordance with the requirements of the community in which the project is located and the guidance provided in the latest edition of NFIP Technical Bulletin 10 related to ensuring that structures built on fill in or near SFHAs are reasonably safe from flooding.

I certify that the design and specifications for the placement of fill are in accordance with accepted professional practices.

The foundation type is: ☐ non-basement or ☐ basement

For basements, the determination is based on: ☐ simplified approach, or
☐ engineered analysis, or
☐ basement floor at or above BFE

Documents attached are: _____

Certifier's Name License Number

Title

Company Name

Address

PLACE SEAL HERE

City State Zip Code

Signature Date Telephone Ext

Figure 2: Example certification for reasonably safe from flooding

Certifications may be provided by professional engineers, professional geologists, professional soil scientists, or other design professionals qualified to make such evaluations. Local officials should have the certification and its supporting documentation submitted with permit applications to be able to make reasonably safe from flooding determinations before issuing building or floodplain development permits. When developers propose fill in SFHAs in all or part of subdivisions, certifications by appropriate professionals should be required for each individually filled lot or proposed structure location. After reviewing MT-1 applications for LOMR-Fs/CLOMR-Fs, FEMA may require additional supporting data that supports the reasonably safe from flooding determination, such as the information outlined in this Technical Bulletin. The local official charged with reviewing the application and signing the Community Acknowledgement form should not sign the form unless the applicant provides sufficient documentation of the assumptions, analyses, and approaches used.

5.3. Elevation Form (Signed by Surveyor or Design Professional)

MT-1 applications must include elevation information certified by a licensed land surveyor, registered professional engineer, or architect authorized by state law to certify elevation information. The MT-1 application includes the Elevation Form (Form 2) to provide information that local officials can use in making the reasonably safe from flooding determination. The Elevation Form may be used for one property or multiple lots in subdivisions. If the LOMR-F request is to make a determination on a structure and the NFIP Elevation Certificate has already been completed, it can be submitted in lieu of the Elevation Form.

The local official can request additional elevation information, such as that provided on the NFIP Elevation Certificate, to use in making the reasonably safe from flooding determination. For requests that involve the proposed construction of buildings elevated on fill, the local official should use the elevation information to make sure that both the lowest adjacent grade elevation and the lowest floor elevation (including basement and crawlspace floors) are at or above the regulated BFE.

6. Best Practices for Administrative Procedures and Higher Regulatory Standards

Communities may choose to implement administrative procedures and adopt regulations to assist with gathering information to increase flood resistance of proposed development and to determine whether a proposed development is reasonably safe from flooding. Administrative procedures can help to alert plan reviewers of sites that have been removed from the SFHA by a LOMR-F so that proposed development on the site is reasonably safe from flooding and conforms to the LOMR-F application. Communities may also adopt higher regulatory standards to further reduce flood risk to buildings on land removed from the SFHA through the LOMR-F process, or to restrict development on or involving fill.

Regulatory Requirements May Exceed NFIP Requirements

Communities are encouraged to adopt local floodplain management regulations to reduce flood risk associated with development on filled areas removed from the SFHA by LOMR-Fs. The NFIP regulations specifically acknowledge that communities are encouraged to exceed the minimum criteria by adopting more comprehensive or higher standards [44 CFR § 60.1(d)] than the minimum criteria [44 CFR § 60.3]. In particular, the regulations note that local officials may have access to information or knowledge of conditions that warrant higher standards and encourage communities to adopt more restrictive criteria. The regulations explicitly state that any floodplain management regulations adopted by a state or community that are more restrictive than NFIP requirements shall take precedence.

The following are examples of administrative procedures and more restrictive or more specific requirements related to placement of fill in SFHAs:

- Stipulate that LOMR-Fs do not remove the land from the regulated flood hazard area for the purposes of floodplain management regulations. The mandatory flood insurance purchase requirement would be removed, but buildings would have to meet all building performance requirements, including that the lowest floor (including basement) be at or above the BFE.

- Develop a checklist of permit application submittals that are necessary when applicants propose placing fill in SFHAs and a checklist of plan review requirements to facilitate a thorough review of the submitted materials.

- When issuing permits for the placement of fill only (no building or structures), stipulate that no buildings can be built on the filled area without a subsequent building permit or floodplain development permit that includes consideration of residual risk, described in Section 1.4 of this Technical Bulletin and ensuring that the lowest floor elevation is at or above the elevation of the BFE that existed at the site prior to the LOMR-F.

- Require building sites that have been or will be filled to have building footprints identified on construction plans and on preliminary and final plats for subdivisions and other developments, and then evaluate those sites using the guidance described in this Technical Bulletin.

- Require grading plans that delineate filled building sites and building footprints as a condition of issuing fill permits and evaluate those building sites using the guidance described in this Technical Bulletin.

- Where building codes are not adopted, modify local floodplain management regulations to incorporate the design and placement of fill requirements of the I-Codes, summarized in Section 3 of this Technical Bulletin.

- Adopt buffer zones or setback zones around the perimeter of fill pads or at the edge of the floodplain and establish limits on construction in these zones.

- Require pilings or columns rather than fill, for the elevation of structures in the SFHA, in order to maintain the storage capacity of the floodplain and to minimize the potential for negative impacts to sensitive ecological areas [44 CFR § 60.22(c)(17)].

- Require applicants to demonstrate that the quantity of fill and area to be filled are the minimum necessary to achieve the intended objective. Limiting the quantity and area of fill limits environmental impacts by minimizing tree and vegetation removal and alteration of natural drainage and infiltration processes.

Floodplain Fill and Loss of Storage and Conveyance

Placing fill in SFHAs along riverine waterways can cause increases in BFEs by reducing the ability of the floodplain to store and convey floodwater. This can result in increased flood damage to both upstream and downstream properties. To reduce the risk of increased damage, some communities prohibit fill, require compensatory storage volume to offset the impact of filled areas, or identify a more restrictive floodway than is shown on FIRMs. At a minimum, the NFIP regulations regarding cumulative development in the SFHA and encroachment in the regulatory floodway must be met. Details of these requirements can be found in 44 CFR §§ 60.3(c)(10) and 60.3(d).

- Control development of filled areas and land that is immediately adjacent to floodplains but higher than the BFE to satisfy the requirement that future buildings in these areas are reasonably safe from flooding by adopting regulations to require permit applicants to sign legally binding agreements before the local official signs the MT-1 Community Acknowledgement Form. Communities may adopt higher standards to further reduce the risk of flooding. Conditions that can be included in binding agreements include:

    - Require, as a condition of final subdivision plat approval, that no basements can be built into filled lots or filled building sites

    - Specifically require that construction be designed, permitted, and constructed in accordance with the guidance in this Technical Bulletin

    - Prohibit excavation of fill for basements with floors below the BFE that existed prior to the placement of fill and the issuance of the LOMR-F

    - Require an agreement prohibiting basement apartments, or limiting basement use to parking of vehicles, building access, and storage

    - Prohibit locating critical facilities on land removed from the SFHA by LOMR-F

- Adopt requirements for areas proposed to be filled for building sites to be designed to have the top grade of the fill (after compaction and settlement) to be above the BFE (not “at the BFE”),

especially when communities already require buildings to be elevated higher than the BFE (see Figure 3). Reasons for requiring additional elevation (called freeboard) above the BFE include:

  - To better protect buildings when flooding rises higher than the BFE
  - When newly available technical information indicates higher flood risk than what is shown in the effective FIRM or FIS or when existing conditions have changed that could increase flooding
  - When an increase in upland development and the addition of impervious surfaces results in greater runoff that increases flood risk
  - To account for future changes that may increase the BFE, including sea level rise and increased rainfall intensity or duration

- For communities that adopt freeboard above the BFE for lowest floor elevation, stipulate that the top grade of the fill must be at or above the elevation required for lowest floors.
- Adopt regulations to limit or prohibit the use of fill in Coastal A Zones, which are areas seaward of the Limit of Moderate Wave Action (LiMWA) delineated by FEMA on FIRMs. The LiMWA delineates where waves associated with coastal flooding are expected to be between 1.5 and 3 feet high during base flood conditions.
- Adopt regulations to limit or prohibit the use of fill in high risk flood hazard areas (e.g., areas prone to flooding from alluvial fans, flash floods, erosion, ice jams, debris, mudslides, high velocity flow, and wave action).
- Modify the sample Reasonably Safe From Flooding Certificate (Figure 2 in Section 5.2 of this Technical Bulletin) to stipulate that the design is reasonably safe from future flooding to a specific year (such as sea level or rainfall projections 50 years from the date of the application) or flooding associated with a higher mean recurrence interval, such as the 500-year flood.

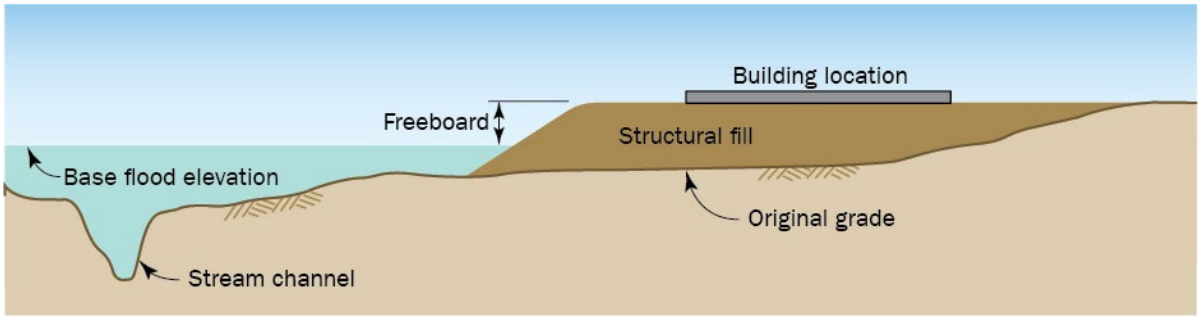


Figure 3: Filled site with freeboard above BFE

7. Proper Design and Placement of Fill

Proper design and placement of fill requires an understanding of soil mechanics, local site conditions, the specific characteristics of the earthen materials being placed, methods to place and compact the fill to achieve the desired characteristics, and soil testing procedures. Standard engineering and soil mechanics texts cover these subjects in detail.

Communities, property owners, designers, and builders should follow best practices when specifying the design and placement of structural fill. The NFIP does not specify requirements for the design and placement of fill in SFHAs, but the general performance requirements of the NFIP must be satisfied. The I-Codes and ASCE 24 have specifications for site grading, fill compaction, side slopes, protection of slopes from erosion during flooding, and design and performance of structural fill (see Section 3 of this Technical Bulletin). Where building codes are not adopted, the fill provisions of the I-Codes and ASCE 24 should be used as best practices or adopted into local floodplain management regulations.

Qualified professionals may be required to design the placement of fill in SFHAs intended to support buildings, and communities may require submission of the signed and sealed certification form described in Section 5.2 of this Technical Bulletin. Property owners should work with a licensed professional engineer, geotechnical engineer, engineering geologist, or other qualified professional licensed in the state in which the building is located to design the fill. The performance of filled areas should consider, but is not limited to, the following fill material characteristics:

- Engineering properties of existing and proposed fill material—soil classification, shear strength, compressive strength, maximum density, permeability, erodibility, liquefaction potential, etc.
- Geotechnical conditions at the site before placement of fill—bearing capacity, groundwater levels, presence of expansive soils or sinkholes, etc.
- Stratification between fill material and underlying soil
- Potential consolidation over time of the existing soil under the weight of added fill
- Effect of consolidation, settlement, or differential settlement of the fill
- Ability of the fill material and side slopes to resist flood-related erosion and scour, especially in SFHAs where base flood velocities exceed 5 feet per second (side slopes should be protected from erosion)
- Ability of fill material and side slopes to withstand rapid drawdown, which could alter the stability of the remaining fill
- How the permeability of fill material and underlying soil affects water infiltration into the fill, which may affect structures built on the site, especially buildings with below-grade basements

Permit application documents should include specifications for the placement of fill, including:

- Proper preparation of the site before fill placement (e.g., grading and compacting, moisture control)
- Thickness of lifts (layers of soil after compaction) and compaction densities
- Side slope ratios and slope stabilization methods
- Placement of fill such that the final top surface of the fill (after compaction and settlement) is at or above the BFE, or higher if freeboard is required, illustrated in Figure 3
- Final grading to drain surface runoff away from buildings

8. Constructing on Land Removed from SFHAs by Placement of Fill

Buildings that are constructed on land removed from the SFHA by the placement of fill have the lowest residual risk of flooding when the entire building (excluding subsurface foundation elements) is elevated above the BFE that existed prior to the placement of fill. Designs that place the lowest floor and below-grade areas at, rather than above, the BFE have a greater degree of residual risk even when flooding rises only slightly higher than the BFE. Designs that place the lowest floor (including a basement floor) below the BFE have the highest degree of risk, with an increased risk of subsurface flooding and damage from flooding that exceeds the BFE. Residual risks of flooding are described in Section 1.3 of this Technical Bulletin and relative residual risks by foundation type are summarized in Section 8.3 of this Technical Bulletin.

8.1. Non-Basement Foundations

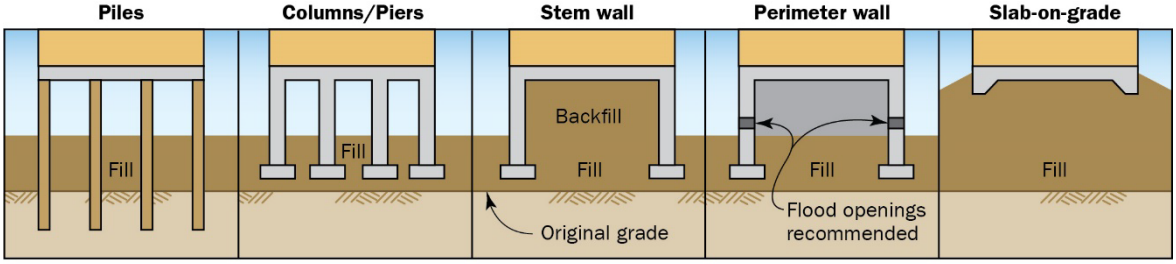
Non-basement foundations do not have any enclosed area that extends below grade on all sides. Non-basement foundations consist of open, stem wall, perimeter walls (crawlspace), and slab-on-grade foundations. Non-basement foundations on fill are illustrated in Figure 4:

- **Open foundations (piles, columns, piers).** Open foundations provide a high degree of flood protection because the piles/columns/piers are used to raise the lowest floor above the surrounding grade and the area under the elevated building allows free flow of floodwater when flooding rises higher than the top surface of the fill. Unless footings extend into undisturbed soil, the fill must be placed to support the more concentrated loads under footings, which may need to be larger than footings that bear on undisturbed soil. This approach can provide freeboard and less resistance to flood forces when the area below the lowest floor is not enclosed. Constructing an open foundation and raising the lowest floor above the BFE provides the highest degree of flood protection especially in areas subject to coastal flooding and areas with high velocity floodwater.

- **Backfilled stem walls.** Stem walls backfilled with fill or gravel raise a floor above the surrounding grade. Backfilled stem wall foundations on fill provide a high degree of flood protection even when the top surface of the fill is at the BFE. Placing fill on the site prior to constructing a backfilled stem wall can provide freeboard for an additional degree of flood protection.

- **Perimeter walls.** Perimeter walls that form crawlspaces raise the floor above the surrounding grade. Perimeter wall foundations on fill provide a high degree of protection when flooding rises above the top surface of the fill. Installing flood openings in the perimeter walls is recommended to allow floodwater to enter the enclosed area to equalize hydrostatic pressure on foundation walls in the event of flooding that exceeds the BFE (see NFIP Technical Bulletin 1, *Requirements for Flood Openings in Foundation Walls and Walls of Enclosures*). Perimeter wall construction is less preferred than the backfilled stem wall construction as an enclosure is created.

- **Slab-on-grade.** Slab-on-grade foundations constructed on fill provide the least flood protection of the non-basement foundations because the floor of the building typically is not elevated above the adjacent grade more than a few inches. Water will enter slab-on-grade buildings when flooding rises higher than a few inches above the top surface of the fill. Placing additional structural fill beneath the building footprint to a level above the BFE increases flood protection.



Note: Pile and footing depth in accordance with local requirements

Figure 4: Non-basement foundation types

8.2. Basement Foundations

NFIP minimum floodplain management requirements generally do not allow basements (any areas that are below-grade on all sides) in SFHAs because of the increased risk of flood damage. However, if FEMA approves the removal of land from the SFHA by the LOMR-F process, floodplain management requirements for buildings in SFHAs no longer apply. Although not recommended, builders and property owners who build on land removed from the SFHA through the LOMR-F process sometimes elect to construct basements. Basements excavated in fill are at higher risk of flood damage than the non-basement foundation types described in Section 8.1 of this Technical Bulletin.

Regulating Excavated Basements for Buildings Elevated on Fill

Filled areas must be regulated as being in the SFHA unless or until FEMA issues the LOMR-F or LOMR, which will remove the filled area from the SFHA. That means that LOMR-F applications involving constructing buildings with basements and simultaneously placing fill (where the land has not yet been removed from the SFHA) are a violation and will not be approved unless the basement floor is at or above the BFE.

In other words, basements with the lowest floor below the BFE, excavated into fill, are prohibited unless the land is first removed from the SFHA through the LOMR-F process prior to construction commencing (or in an approved basement exception community). Additionally, basements that are part of engineered, dry floodproofed non-residential buildings (in Zone A only) are allowed in the SFHA.

Basement foundations enclose areas that extend below grade on all sides. The scenarios described in this section are listed in order of increasing risk of flood damage. Basement foundations in fill are illustrated in Figure 5:

- **Basement floor at or above BFE**. Placing the floor of a basement in fill at or above the BFE effectively eliminates risk of damage when flooding rises to the BFE. In general, the higher the basement floor is relative to the BFE, the lower the risk of damage from seepage and hydrostatic pressure caused by saturated soils.

- **Basement floor below BFE**. Placing the floor of a basement in fill below the BFE may expose the basement walls and floor to damage from seepage and hydrostatic pressure caused by saturated soils when flooding rises up to or higher than the BFE.

- **Lowest opening above BFE**. Regardless of where the floor of a basement in fill is placed, risk of flood damage is increased when an opening (window well or exterior doorway) is located below-grade, even when positioned above the BFE. When below-grade openings are located above the BFE, then seepage associated with soils saturated by flood up to the BFE would not enter the basement through those openings. However, below-grade openings would allow surface water into the basement when flooding rises higher than the top of the fill.

- **Lowest opening at or below BFE**. Placing the floor of a basement in fill below the BFE with a below-grade opening (window well or exterior door) also located below the BFE increases the risk of damage. If the fill becomes saturated when flooding rises up to or higher than the BFE, the below-grade openings could allow seepage to enter the basement. Below-grade openings would also allow surface water into the basement when flooding rises higher than the top of the fill.

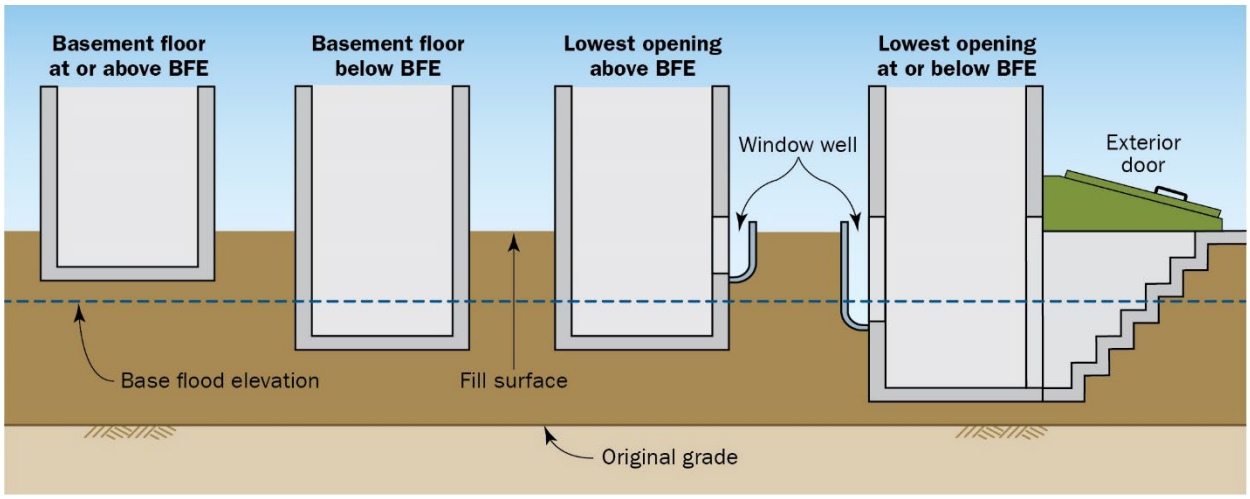


Figure 5: Four scenarios of basements built into fill

Number of Sides Below Grade

An enclosure that is below the exterior ground level on all sides is a basement regardless of the depth below grade or the height of the enclosure (headroom). An area of a building that is below grade on two or three sides (i.e., the floor or interior grade is at or above the exterior grade along at least one entire side) is not a basement, although the area may be called a walkout basement, daylight basement, or terrace or garden level.

8.2.1. RISK OF SUBSURFACE FLOODING

Constructing a basement foundation in filled land is not recommended because the basement floor and portions of the basement walls can be subject to subsurface flooding. High groundwater at a site with a basement can result in water infiltrating the basement or significantly increasing hydrostatic pressures on the walls and basement slab, which can cause failure or permanent deformation of the walls (see Figure 6). Approaches to analyzing seepage (saturation and infiltration) of water into filled soils are described in Section 9 of this Technical Bulletin. Even when surface floodwater has not reached buildings with basements, FEMA has seen numerous examples of flooded basements, bowed basement floors, and collapsed basement walls caused by high groundwater associated with nearby flooding.

Figure 6: Unreinforced masonry walls of a basement that failed because of the pressure exerted by water and saturated soil

Another reason why constructing basement foundations in filled land is not recommended is because when flooding rises higher than the top of the filled area, the basement area may be completely inundated, especially if the basement has window wells or an exterior entrance. When builders and building owners decide to accept the additional risk associated with basement construction on filled land, they need to satisfy the requirement that the basement and the rest of the building are reasonably safe from flooding.

8.2.2. RECOMMENDATIONS TO REDUCE RISK OF SUBSURFACE FLOODING

To be reasonably safe from flooding during base flood conditions, proposed or existing structures on filled land must not be vulnerable to damage by subsurface flooding. This means that during base flood conditions, the basements are dry, structurally sound, and not exposed to lateral hydrostatic and uplift pressure (buoyancy loads) and saturated soil loads that either exceed the structural capacity of walls and floors or that cause unacceptable deflections.

This Technical Bulletin does not address the structural design of foundations and basement walls, nor does it address the design of drainage systems. Floors, slabs, and walls should be designed for the hydrostatic pressures that can occur during conditions of flooding. For structural design, it is recommended that the full hydrostatic pressures be assumed as unrelieved by a subsurface drainage system. Foundation walls that are not designed for full hydrostatic pressures should not be used. Soils around the basement should have low permeability to minimize or stop water infiltration into the basement walls and floor. Regardless of the permeability of the fill soils, water that infiltrates to the basement should be removed by a drainage system on the outside (soil side) of the basement. Sump pumps to remove seepage into below-grade areas should also be considered.

To minimize the additional risk of subsurface flooding, the following site planning and construction practices are recommended:

- Locate structures as far from the SFHA as possible (farther back from the edge of the fill closest to the flooding source).
- Elevate basement floors as much as possible, preferably to or above the BFE. As the elevation of the basement floor increases, the risk of subsurface flooding decreases.
- For below-grade areas, implement flood-resistant construction practices, including fill material specifications and compaction, and use of flood damage-resistant materials, properly sized sump pumps, and foundation drainage.
- For below-grade areas, to stop the capillary transmission of water from soil to concrete, provide a capillary break (a physical gap between the water or wet soil and the foundation wall). This can be a waterproof membrane, a layer of granular fill (gravel or crushed stone), or a manufactured drainage membrane against the basement wall.
- Grade the surrounding area to slope away from the structure.
- Implement construction practices or requirements based on local knowledge of conditions and the risk of subsurface flooding.

Warning about Pumping Basements

Owners and occupants should take precautions before pumping out water from flooded basements. When floodwater is rapidly pumped from basements and the soil surrounding the basement walls is still saturated, the walls can collapse, and the floor can be pushed up or cracked. As the water level in the basement drops, the outside pressure on the basement walls and floor can become greater than the inside pressure.

When basements are flooded, owners should contact experienced contractors to determine when and how best to safely pump out basements.

8.3. Relative Residual Risk by Foundation Type

Residual risks are described in Section 1.3 of this Technical Bulletin. The degree of residual risk that a foundation built on or in fill is exposed to depends on the proper design and placement of fill (see Section 7 of this Technical Bulletin), site-specific conditions (such as soil mechanics, hydrology, and topography), and the following building-related factors:

- The foundation type
- The elevation of the foundation or floor relative to the BFE

- The elevation of fill relative to the BFE
- The location of windows, window wells, doors, or other openings (basement foundations only)

Table 3 and Table 4 summarize the features of non-basement foundations (see Figure 4) and basement foundations (see Figure 5) that are described in Sections 8.1 and 8.2 of this Technical Bulletin and rank the combinations of elevation and foundation types in terms of relative residual risk compared with open foundations, which have the lowest degree of risk. The tables indicate whether each combination results in buildings that are reasonably safe from flooding. Where noted in Table 4, some combinations are reasonably safe from flooding only when seepage analyses are prepared by a qualified professional as described in Section 9 of this Technical Bulletin.

Table 3: Non-Basement Foundations: Relative Residual Risk Based on Foundation Type and Elevations

Relative Residual Risk	Foundation Type	Fill Elevation	Lowest Floor Elevation	Reasonably Safe from Flooding?
None	Piles, columns, piers	Above BFE	Above BFE	Yes
		At BFE	Above BFE	Yes
Minor	Backfilled stem wall	Above BFE	Above BFE	Yes
		At BFE	Above BFE	Yes(1)
Minor	Perimeter wall (crawlspace)	Above BFE	Above BFE	Yes
		At BFE	Above BFE	Yes(1)
Moderate	Slab-on-grade	Above BFE	Above BFE	Yes
		At BFE	At BFE	Yes(1)

(1) Non-basement foundations with fill elevation at the BFE are not recommended because buildings are vulnerable when flooding rises higher than BFE

Table 4: Basement Foundations: Relative Residual Risk Based on Elevations

Relative Residual Risk	Fill Elevation	Basement Floor Elevation	Opening Location	Reasonably Safe from Flooding?
Minor	Above BFE	Above BFE	Above BFE	Yes
	Above BFE	At BFE	Above BFE	Yes
Moderate	Above BFE	Below BFE	Above BFE	Only when using simplified approach or verified by engineering analysis (see Section 9 of this Technical Bulletin).

Relative Residual Risk	Fill Elevation	Basement Floor Elevation	Opening Location	Reasonably Safe from Flooding?
High	At BFE	Below BFE	Above BFE	Only when using simplified approach or verified by engineering analysis (see Section 9 of this Technical Bulletin).
	At BFE	Below BFE	At BFE	Only when using simplified approach or verified by engineering analysis (see Section 9 of this Technical Bulletin).
	Above BFE	Below BFE	Below BFE	No
	At BFE	Below BFE	Below BFE	No

Note: Basement foundations are not recommended because buildings are vulnerable when flooding rises higher than the BFE. Basements excavated into fill are prohibited below the BFE, unless the land has been removed from the SFHA by LOMR-Fs or LOMRs prior to construction (or in an approved basement exception community).

Elevator Pits Below Grade on All Sides

NFIP Technical Bulletin 4, *Elevator Installation*, provides guidance for construction of elevator pits. When elevator pits are the minimum size necessary and are designed in accordance with the guidance, the pits are not considered basements.

9. Basement Foundations: Technical Approaches to Seepage Analysis to Determine Reasonably Safe from Flooding

This section provides guidance on seepage analysis and measures that can be taken when building owners desire to construct basements in land that has been filled and removed from the SFHA by a LOMR-F. The guidance will help protect and satisfy the requirement that the basements are reasonably safe from flooding. Local officials should be cautious about allowing excavation for basements in filled areas without consideration of seepage during flood events, even when the filled areas are officially removed from the SFHA.

The guidance in this section is not to be used to make a determination that existing structures with the lowest floor (basement) below the BFE are reasonably safe from flooding.

Communities must regulate filled areas as SFHAs, unless the filled areas are officially removed from the SFHA by FEMA. Non-basement foundations (open foundations, backfilled stem wall, perimeter wall, slab-on-grade) and basement foundations with basement floors at or above the BFE can be used and are assumed to be reasonably safe from flooding (see Section 8.3 of this Technical

Bulletin). However, basements with floors proposed below the BFE are not permitted for residential buildings if the filled areas are still in the SFHAs. Non-residential buildings in SFHAs may have basements provided the floodplain management requirements for dry floodproofing are satisfied.

Limitations

The guidance in this section does not apply to:

- New construction or substantially improved buildings in SFHAs (not removed through the LOMR-F process). The NFIP regulations require buildings and structures in SFHAs to have the lowest floors, including basements, at or above the BFE. In effect, areas that are below grade on all sides (basements) are not permitted (unless authorized as part of dry floodproofed non-residential buildings).
- Placement of fill around existing residential or non-residential buildings where the lowest floor is below the BFE with the intent of changing the lowest adjacent grade to remove the building from the SFHA.

The first step in determining whether a basement will be reasonably safe from flooding is to analyze seepage that may occur during base flood conditions. For a local official to deem a building reasonably safe from flooding, the analysis must show that base floodwater will not inundate the land or damage structures and that any subsurface waters related to the base flood will not damage buildings.

The two approaches to seepage analysis described in this section—the simplified approach and the engineered analysis approach—may be used to evaluate proposed buildings with basement floors below the BFE in filled areas. The simplified approach is presented first. When the design requirements, limitations, and assumptions for the simplified approach are not met or are not applicable, the engineered analysis approach must be used.

Some possible means for evaluating whether the limitations and requirements of the approaches are met may require soil tests and investigations, including soil borings and hand augers; field records from the time the fill was placed; and soil surveys. If the standards of practice, design requirements, and conditions for use of the simplified approach are not met, a licensed professional engineer, geotechnical engineer, engineering geologist, or other qualified professional must perform the more detailed analysis described for the engineered analysis approach. More extensive soil investigations and testing will likely be necessary to complete the analysis and demonstrate that buildings will be reasonably safe from flooding.

Documentation to Submit

Documentation of the approach used, including assumptions and analysis performed, should be submitted to the local official so the local official can make the reasonably safe from flooding determination. Local officials responsible for signing the Community Acknowledgment Form can use the requirements and limitations of the simplified and engineered analysis approaches as an aid to determine whether sufficient analyses and documentation are provided (see Section 5.1 of this Technical Bulletin).

9.1. Simplified Approach

The simplified approach is a set of design requirements and limitations (see Section 9.1.1 of this Technical Bulletin) for basement foundations excavated in fill with basement floors below the BFE. If the design requirements and limitations are satisfied, the buildings are reasonably safe from flooding. Section 9.1.2 of this Technical Bulletin outlines the assumptions for the simplified approach.

If any one of the design requirements, limitations, or assumptions of the simplified approach are not satisfied, the more detailed engineered analysis approach described in Section 9.2 of this Technical Bulletin must be performed to determine whether a building with a basement floor below the BFE can be considered reasonably safe from flooding.

9.1.1. DESIGN REQUIREMENTS AND LIMITATIONS

The simplified approach does not eliminate the need for soil tests and investigations, which will likely require a licensed professional engineer, geotechnical engineer, engineering geologist, or other qualified professional. A qualified professional should consider the proposed building design and should investigate and document proposed fill material characteristics and the site conditions. The design requirements and limitations of the simplified approach are presented in this section and grouped as building design, fill placement, fill material characteristics, and site conditions. Figure 7 illustrates these requirements and limitations.

Limiting Assumption for the Simplified Approach

The simplified approach assumes there will be no hydrostatic pressure on the foundation because a standard drainage system is provided. The drainage system must include a sump pump that discharges above the BFE and has backup power to function during floods.

Building Design

To use the simplified approach:

- The footprint of the basement must be less than or equal to 1,200 square feet.

- The basement must have no open penetration through the wall or floor.
- The basement floor must be less than 5 feet below the BFE. The depth of the basement floor can be shallower to achieve more favorable conditions.
- There must be a granular drainage layer beneath the floor slab. If a granular soil (typically gravel or sand) is used as the drainage layer below the slab, the gradation of the drainage material should be designed to be compatible with the gradation of the fill material to reduce movement of fines. Crushed stone wrapped with filter fabric below the slab and around the perimeter of the foundation may be an option.
- A minimum of at least one single ¼-horsepower sump pump with a backup power supply must be provided to remove seepage from the drainage layer. More than one sump pump or a sump pump with higher capacity (the horsepower requirement, also called "size") may be necessary. The total pump capacity must be calculated based on the quantity of seepage flow, which depends on soil permeability and other site conditions (see Figure 8 and Equation 1 in Section 9.1.2 of this Technical Bulletin). The pump must be rated at four times the estimated seepage rate and must discharge above the BFE and away from the building. This arrangement is essential to prevent build-up of hydrostatic pressure against the basement walls and uplift of the floor under the effect of the seepage pressure.
- The drainage system must be equipped with a positive means of preventing backflow.

I-Code Exception for Foundation Drainage

The I-Codes generally allow foundation drains to discharge through either mechanical means or gravity drains and do not require drainage systems in well-drained soils (gravel or sand/gravel mixture). In or near floodplains, well-drained soils can increase groundwater flow toward the building foundation during conditions of flooding. Therefore, this exception should not apply in or near floodplains.

Fill Placement

To use the simplified approach:

- The filled ground surface around the building and within a defined setback distance from the new edge of the SFHA must be at or above the BFE. The setback distance is measured from the new edge of the SFHA to the nearest wall of the basement. The minimum allowable setback distance is 20 feet.
- The fill material—or existing underlying soil of similar classification and degree of permeability as the fill material—must extend to at least 5 feet below the bottom of the basement floor slab.
- The fill material must be compacted to at least 95% of its maximum standard proctor density according to ASTM International (ASTM) Standard D698, *Standard Test Methods for Laboratory*

Compaction Characteristics of Soil Using Standard Effort (ASTM 2021a). Alternatively, the fill material must be compacted to at least 90% of its maximum modified proctor density according to ASTM Standard D1557, *Standard Text Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort* (ASTM 2021b).

Fill Material Characteristics

To use the simplified approach:

- The fill material must be homogeneous and isotropic, which means the fill material must be all of one material, and the engineering properties must be the same in all directions.
- Fill soils must be fine-grained soils of low permeability, such as those classified as CH, CL, SC, or ML according to ASTM Standard D2487, *Standard Practice for Classification of Soils for Engineering Purposes* (ASTM 2020). See IRC Table R405.1 for descriptions of these soil types.

Site Conditions

To use the simplified approach:

- The normal and seasonal high water table (including perched water table) must be lower than the proposed floor of the basement.
- There must be a constant soil type and density over the seepage flow zone (measured horizontally by the setback distance between the building and the edge of the SFHA and vertically from the BFE to the base of the seepage flow zone). The underlying soils at the site must not have stratified soil layers.
- The depth of the base of the seepage flow zone must be able to be defined (see Figure 8 in Section 9.1.2 of this Technical Bulletin). This depth is needed in the calculation of the quantity of seepage flow, which is necessary to determine the total quantity of seepage that determines the required sump pump capacity.
    - If the base of the seepage flow zone is not known, its depth below the bottom of the basement floor slab can be conservatively approximated as one-half of the building width most nearly perpendicular to the shoreline or bank of the source of flooding. This would approximate the boundary effects of the three-dimensional seepage flow in that it would represent the flow coming in from all sides and meeting in the center beneath the floor slab.

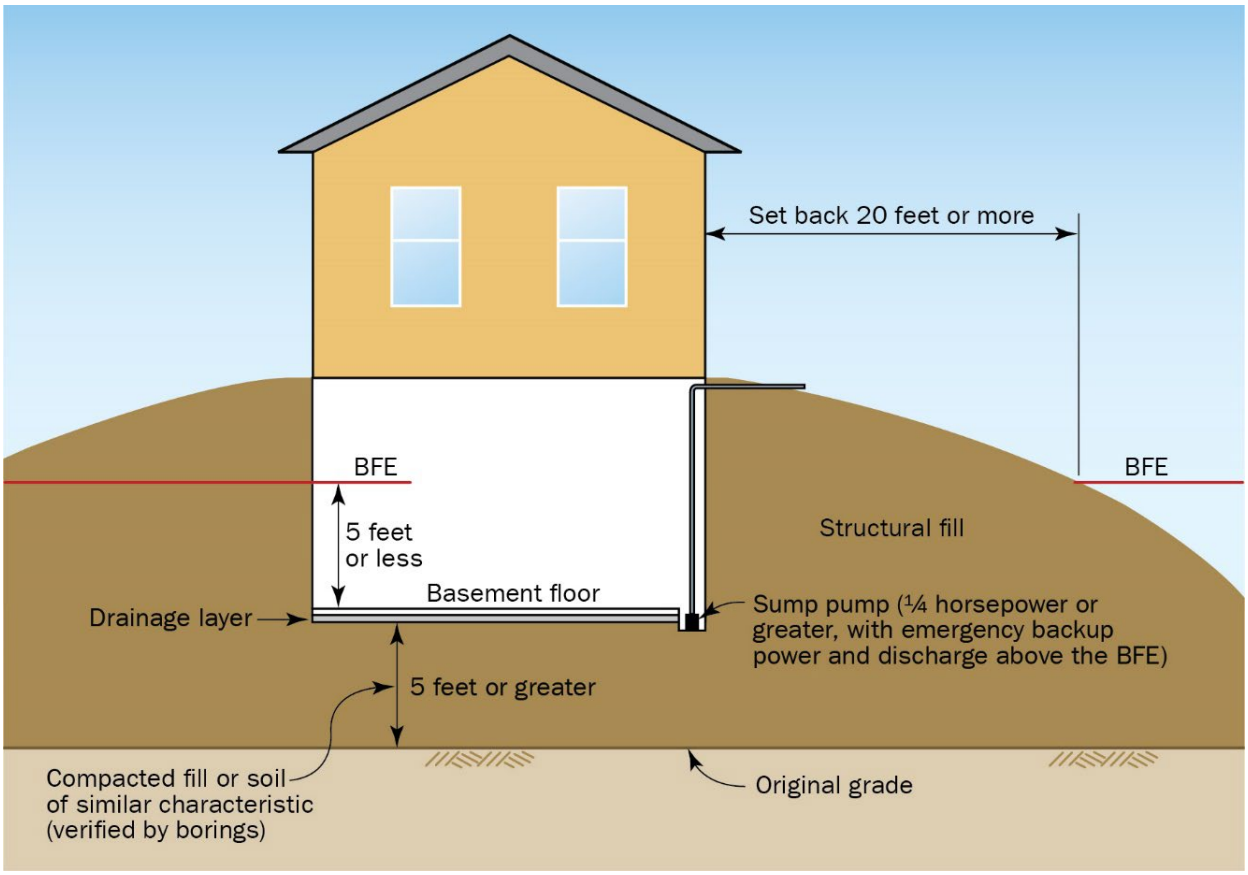


Figure 7: Limitations on the use of the simplified approach to basement construction

9.1.2. ASSUMPTIONS FOR THE SIMPLIFIED APPROACH

The simplified approach is based on the following assumptions:

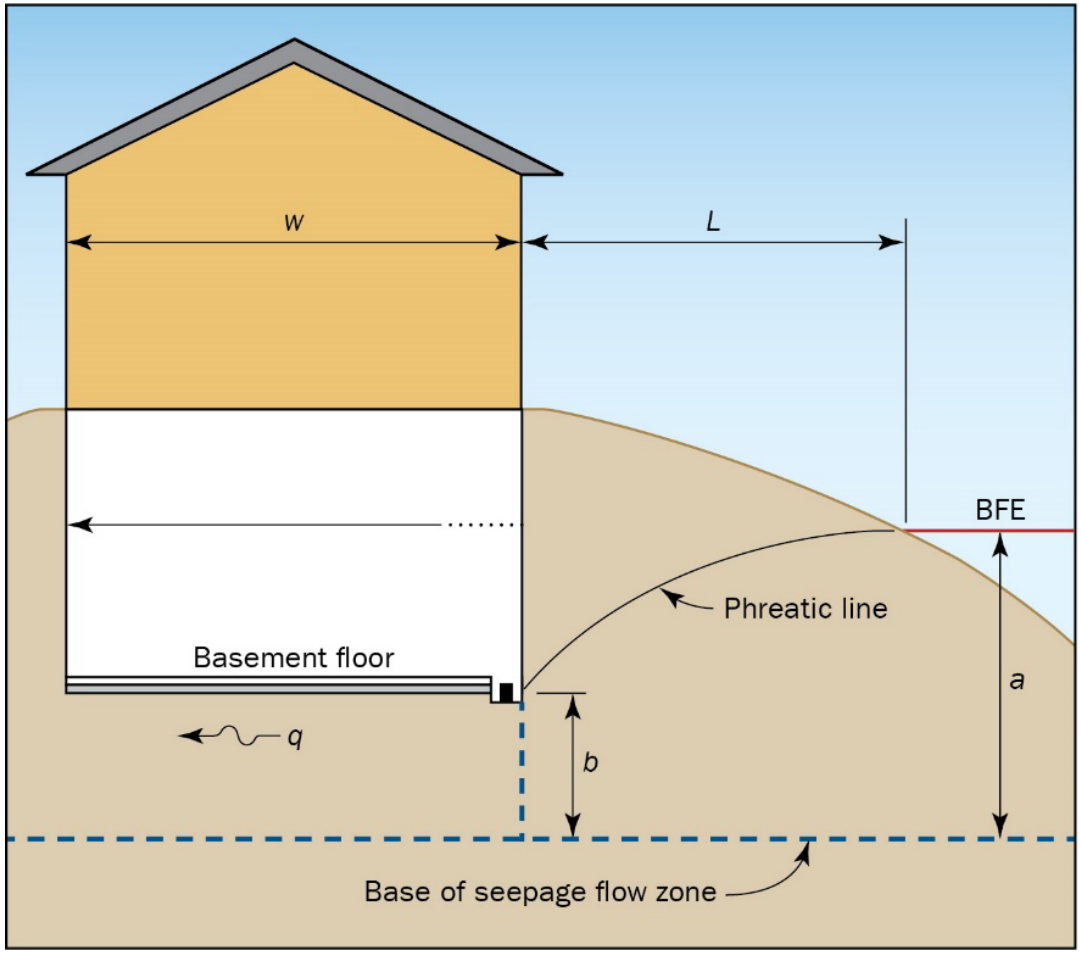
- The soil is saturated. Using this assumption means there will be no time lag in the development of the seepage pattern with a change in flood levels. The groundwater table in many floodplains is shallow and fine-grained soils have a substantial potential for maintaining saturation above the water table by capillary rise.

- The tailwater level is at the elevation of the BFE. For this Technical Bulletin, "tailwater" is defined as the groundwater level on the side of the building away from the flooding source. This is a reasonably conservative assumption because the groundwater level is expected to rise during flooding conditions. In some cases, the tailwater level can be higher than the flood level because there is higher ground, such as a valley wall, that drains groundwater into the floodplain soils.

- The quantity of seepage flow can be calculated by the Dupuit equation for flow in an unconfined aquifer, in this case for flow in fill. The Dupuit equation uses Darcy's law with specific physical characteristics. A more detailed description of these equations and their application can be found in standard references for soil mechanics and groundwater hydrology. The Dupuit equation and the values used in the Dupuit equation are illustrated in Figure 8.

- The entry surface, with hydraulic head "*a*," is a vertical line measured beginning where the BFE intersects the fill, extending down to the base of seepage flow zone.
- The exit surface, with hydraulic head "*b*," is a vertical line measured beginning from the basement floor closest to the fill slope, extending down to the base of seepage flow zone.
- The length of the flow path, "*L*," is the setback distance.
- Flow is assumed to be horizontal. For simplicity, the small, inclined entry zone at the edge of the water source and the exit zone below the basement floor are ignored. This is a reasonably conservative measure.
- The soil permeability, "*k*," is based on the type of fill soils. Because the soils must be homogeneous and seepage flow is assumed to be horizontal, only one value for "*k*" is used.
- The phreatic line (the line below which the seepage flow occurs), extends from the edge of the fill in contact with floodwater to the bottom of the basement floor slab. If the exit zone below the basement floor was included, the hydraulic head at "*b*" would be higher. As shown in Figure 8, the phreatic line is not a straight line, but within the limits of the boundary values assumed for the simplified approach, it is close to a straight line.
- To obtain the total quantity seepage flow in cubic feet per second, the value "*Q*," the unit quantity of seepage, "*q*," is multiplied by the length around the perimeter of the below-grade portion of the building, "*P*."

Soil permeability, "*k*," has a significant effect on the quantity of seepage that must be collected and discharged by the drainage layer and sump pump. The calculation of "*Q*" determines the number and capacity of sump pumps (the horsepower requirement, also called "size"). To allow for possible errors in the estimation of soil permeability, the pump or pumps should have a capacity of at least four times the calculated value of "*Q*." As noted in Section 9.1.1 of this Technical Bulletin, a minimum of at least one standard sump pump of ¼ horsepower is needed to satisfy the requirements of seepage removal for the conditions described in this section for use of the simplified approach. Equation 1 shows an example calculation of sump pump capacity.



The Dupuit equation for the quantity of seepage flow is:

$q = k(a^2 - b^2)/2L$

where: q = flow in cubic feet per second for a 1-foot width of seepage zone

k = soil permeability in feet per second (fps) (maximum value of k is 1×10^{-3} fps)

a = hydraulic head at entry surface in feet ($a < b + 5$)

b = hydraulic head at drain surface in feet

L = length of the seepage zone (setback distance) in feet ($L > 20$ feet)

The equation for the total seepage flow is:

$Q = Pq$

Q = total seepage flow in cubic feet per second

P = length around the perimeter of the below-grade portion of the structure

Required sump pump capacity is:

Capacity = $4Q$

Figure 8: Method of calculating quantity of seepage flow using the Dupuit equation

The following is an example calculation of sump pump capacity within the limits of the simplified approach. The variables are defined in Figure 8.

Equation 1:

$$q = \frac{k\left(a^2 - b^2\right)}{2L} = 1 \times 10^{-3} \times \frac{81 - 25}{40} = 0.0014 \text{ cubic feet per second per linear foot}$$

$$Q = P \times q = 140 \times 0.0014 = 0.196 \text{ cubic feet per second}$$

$$\text{Capacity} = 4Q = 4(0.196) = 0.784 \text{ cubic feet per second}$$

Where:

k = 1x10^{-3} feet per second
a = 9 feet
b = 5 feet
L = 20 feet
P = 140 feet (length = 40 feet; width = 30 feet)

9.2. Engineered Analysis Approach

The engineered analysis approach is an evaluation of proposed fill soils and seepage when basements are excavated into fill. When the design requirements, limitations, and assumptions described for the simplified approach (Section 9.1 of this Technical Bulletin) cannot be satisfied, detailed engineering analyses must be prepared by a licensed professional engineer, geotechnical engineer, engineering geologist, or other qualified professional. Reports of the results of the analyses help local officials to determine whether proposed buildings with basements constructed in fill with the basement floor below the BFE will be reasonably safe from flooding, which is needed for the local official to be able to sign the MT-1 Community Acknowledgement Form. Detailed engineering analyses should consider, but are not limited to, the issues described in the following sections.

9.2.1. DEPTH, TYPE, AND STRATIFICATION OF SOILS

The combination of depth of soil, soil type, and stratification of soils at specific sites may be complex, whether the soils are natural soils or fill material. An engineering analysis of whether a basement will be reasonably safe from flooding must account for variations in soils as part of applying the Dupuit equation to estimate the total amount of seepage that must be collected and discharged by the drainage layer and sump pump (see Figure 8 and Equation 1). The total amount of seepage determines the number and size (or capacity) of sump pumps necessary.

Terminology: Pervious and Impervious Soils

In the Dupuit equation, soil permeability, "k," varies based on the characteristics of the soils:

- **Pervious soils**, also called well drained soils, allow relatively free movement of water.
- **Impervious soils** have low infiltration rates and offer resistance to the movement of water.

It is common for natural floodplain soils to be stratified in layers of different soil compositions. Four general cases illustrating how soil types and stratification affect seepage into basements are shown in Figure 9. Case A and Case B show homogeneous soils and Case C and Case D show simple stratified soils:

- **Case A** illustrates impervious clayey soils, either fill or natural deposits or a combination, which are more or less homogeneous and have similar engineering properties, including low permeability. If an adequate setback distance is provided (see "L" in Figure 8), the quantity of seepage flow ("*q*") into a basement would be relatively low, and uplift pressure beneath the slab could be controlled by a drainage layer and adequately sized sump pump.

- **Case B** illustrates pervious sandy soils, either fill or natural soil deposits or a combination, which are more or less homogeneous and have similar engineering properties, including high permeability. The quantity of seepage flow ("*q*") into a basement could be fairly large, in which case attention would have to be given to the setback distance and to the design of the drainage layer and an adequately sized sump pump to prevent excessive uplift pressure beneath the floor slab.

- **Case C** illustrates stratified soils with the contact between the two strata at some distance below a proposed basement floor. The quantity of seepage flow would be moderate, depending on the thickness ("*d*") of the layer of impervious soils below the basement floor. There is also potential for uplift pressure beneath the floor slab, at the level of the bottom of the impervious stratum. These factors must be considered when specifying the drainage layer and when determining an adequate number and size (capacity) of sump pumps.

- **Case D** shows impervious soils overlying pervious soils, with the contact between the soil strata at some distance above the basement floor. Depending on how deep into the pervious layer the basement extends, there could be a large quantity of seepage ("*q*") and potential for excessive uplift beneath the basement floor, which must be controlled by installing a drainage layer and an adequate number and size (capacity) of sump pumps.

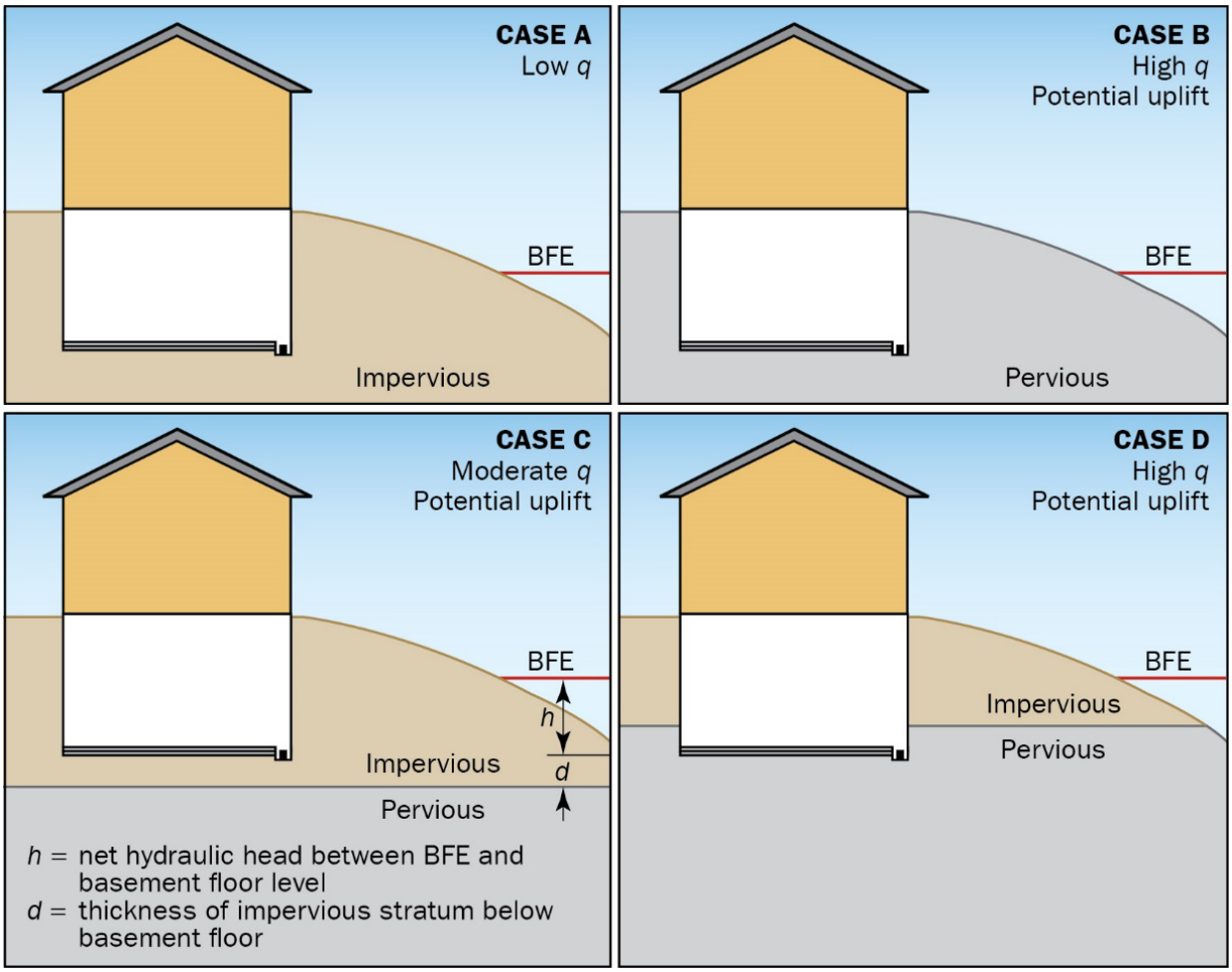


Figure 9: Generalized scenarios with homogeneous (Cases A and B) and stratified (Cases C and D) soils affecting quantity of seepage ("q") into basements

9.2.2. GEOTECHNICAL INVESTIGATIONS FOR ENGINEERING ANALYSES

In addition to the engineering design of regular foundations, the design professional who prepares an engineering analysis may require geotechnical investigations to determine whether a building with a basement in fill, with the basement floor below the BFE, will be reasonably safe from flooding. Information that is needed to prepare an engineering analysis includes:

- A flow net that accounts for all boundary conditions may be required for analysis of uplift pressures. Uplift pressures may be more significant in stratified soils than in homogeneous soils.

- The BFE, which is to be used as the floodwater entry surface for calculating expected seepage. The entry surface, with hydraulic head, "a," is a vertical line measured beginning where the BFE intersects the fill, extending down to the base of seepage flow zone (see Figure 8).

- The depth below grade of the bottom of the basement floor, which is to be used as the exit or drainage surface. The foundation design should be adjusted as needed to decrease the depth of the basement floor to achieve more suitable conditions. The exit surface, with hydraulic head,

"b," is a vertical line measured beginning from the basement floor closest to the fill slope, extending down to the base of seepage flow zone (see Figure 8).

- The setback distance from the edge of the SFHA to the nearest wall of the basement, shown as "L" in Figure 8. The location of the building can be moved farther away from the flooding source to achieve more suitable seepage control. The design professional will determine the length of the flow path which, at a minimum, is the setback distance. Figure 8

- The elevation of the groundwater table and its seasonal variations. It may not be feasible to have basements when sites have normally high water tables, even without the added seepage that may occur during flood events.

- The stratification of the subsurface materials, for both natural and fill soils (see Section 9.2.1 of this Technical Bulletin). In general, borings should be drilled to a depth below the proposed bottom of the basement floor slab, extending at least two times the depth of the floor slab below the BFE.

- The engineering classification of the soils, for both the natural underlying soils and the fill soils. The classification should be determined in accordance with ASTM D2487, *Standard Practice for Classification of Soils for Engineering Purposes* (Unified Soil Classification System), which is used throughout the United States. Typical local or county agricultural soil survey maps may not be sufficient because they do not give site-specific information at a small enough scale to provide detailed location and depth of soils, and their designations are not pertinent to use for engineering designs.

- Subsurface conditions landward from the building, away from the source of flooding. Conditions of interest include the location of the groundwater table (whether it is higher or lower than the BFE) and whether there is any penetration of soil layers, such as ponds, that are sources of subsurface water. Attention should be given to the possibility that higher ground, such as valley walls, could contribute to the groundwater level in the floodplain, either perennially or during periods of heavy rain.

- Whether a proposed basement will have penetrations through the basement walls, such as utility lines and other openings. Unless specifically sealed to prevent infiltration, penetrations may allow seepage that is not accounted for when determining the number and size (capacity) of sump pumps.

10. References

This section lists references cited in the Technical Bulletin. Additional resources related to NFIP requirements are provided in Technical Bulletin 0.

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- Technical Bulletin 0, *User's Guide to Technical Bulletins*
- Technical Bulletin 1, *Requirements for Flood Openings in Foundation Walls and Walls of Enclosures*
- Technical Bulletin 4, *Elevator Installation*

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Requirements for Flood Openings in Foundation Walls and Walls of Enclosures

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

NFIP Technical Bulletin 1 / March 2020

FEMA

Comments on the Technical Bulletins should be directed to:

Department of Homeland Security / Federal Emergency Management Agency
Federal Insurance and Mitigation Administration (FIMA) Risk Management Directorate
Building Science Branch
400 C Street, S.W., Sixth Floor
Washington, DC 20472-3020

NFIP Technical Bulletin 1 (2020) replaces NFIP Technical Bulletin 1 (2008), *Openings in Foundation Walls and Walls of Enclosures*.

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Acronyms

ASCE	American Society of Civil Engineers
BFE	base flood elevation
CFR	Code of Federal Regulations
DHS	Department of Homeland Security
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
IBC	International Building Code®
ICC	International Code Council®
ICC-ES	ICC Evaluation Service
I-Codes	International Codes®
IRC	International Residential Code®
LiMWA	Limit of Moderate Wave Action
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
SEI	Structural Engineering Institute
SFHA	Special Flood Hazard Area

1 Introduction

This Technical Bulletin explains the National Flood Insurance Program (NFIP) requirements for flood openings in foundation walls and walls of enclosures below elevated buildings in Special Flood Hazard Areas (SFHAs) that are designated as Zone A (A, AE, A1-30, AH, and AO) on Flood Insurance Rate Maps (FIRMs). The flood opening requirements are intended to equalize hydrostatic forces (loads or pressure caused by standing or slow-moving water) on walls, thus preventing damage to or collapse of the building (see Figure 1). The requirements are not intended to reduce flood damage caused by hydrodynamic loads associated with fast-moving water (e.g., faster than 10 feet per second), wave impacts, or debris impacts.

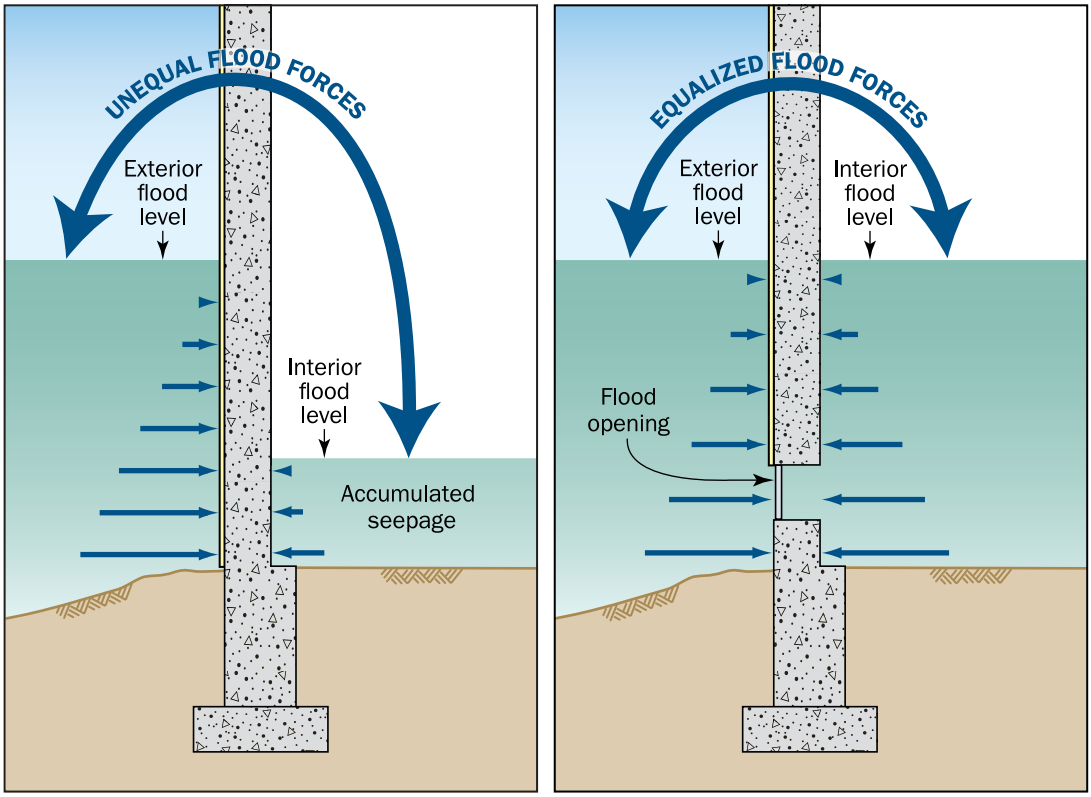


Figure 1: Equalizing flood forces (hydrostatic loads) on exterior walls

This Technical Bulletin includes the following:

- Examples of foundation walls and enclosure walls that require openings. Figure 2 illustrates typical enclosures with flood openings in Zone A: a crawlspace foundation wall, a non-load-bearing wood-framed wall surrounding an enclosed area under a piling- or column-supported building, and a concrete or masonry load-bearing foundation wall surrounding an enclosed area. Other types of enclosures or situations may require the advice of a registered design professional.
- Information on installing flood openings, including the minimum number and minimum height above grade, and examples of installations.

- Guidance on prescriptive (non-engineered) and engineered flood openings. Non-engineered openings do not have moving parts and may be used to meet the NFIP prescriptive requirement for 1 square inch of net open area for every square foot of enclosed area. Engineered openings may be used if designed and certified by a registered design professional as meeting certain performance characteristics.
- Description of how flood openings affect NFIP flood insurance premiums.
- Guidance on documenting building elevations and flood openings using the NFIP Elevation Certificate (FEMA Form 086-0-33) (FEMA, 2015).

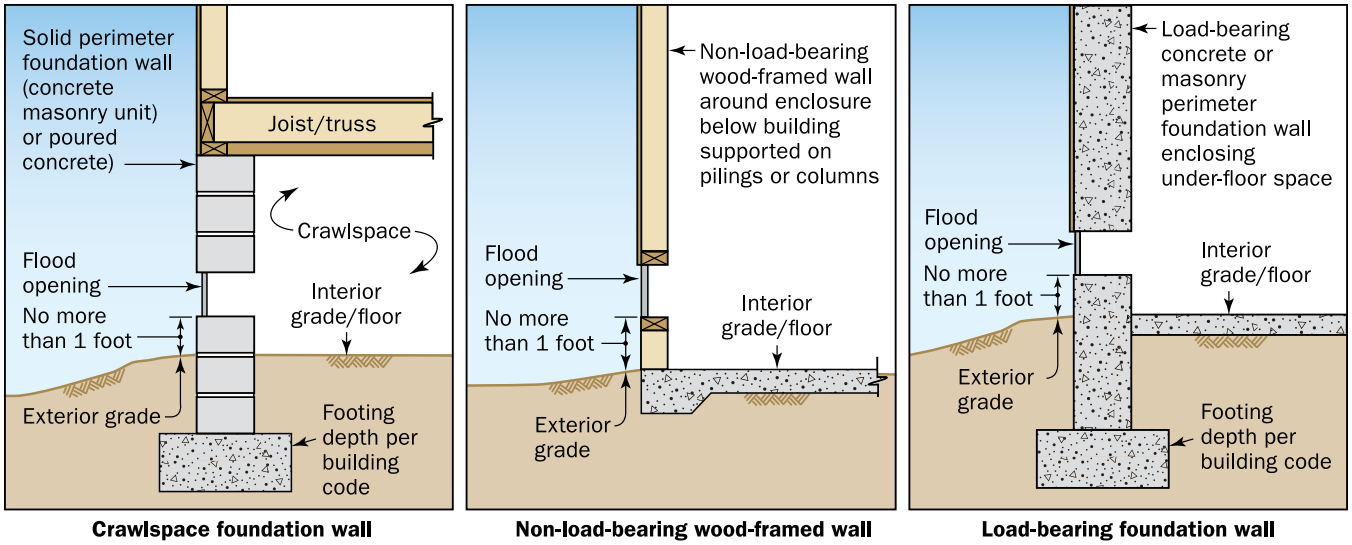


Figure 2: Typical enclosures with flood openings in Zone A

Questions about enclosure and flood opening requirements should be directed to the appropriate local official, NFIP State Coordinating Office, or Federal Emergency Management Agency (FEMA) Regional Office.

NFIP TECHNICAL BULLETIN 0

NFIP Technical Bulletin 0, *User's Guide to Technical Bulletins*, should be used as a reference in conjunction with this Technical Bulletin. Technical Bulletin 0 describes the purpose and use of the Technical Bulletins, includes common concepts and terms, lists useful resources, and includes a crosswalk of the sections of the NFIP regulations identifying the Technical Bulletin that addresses each section of the regulations and a subject index.

Readers are cautioned that the definitions of some of the terms that are used in the Technical Bulletins are not the same when used by the NFIP for the purpose of rating flood insurance policies.

NFIP TERMS USED IN THIS TECHNICAL BULLETIN

- **Basement:** Area of a building that has its floor subgrade (below ground level) on all sides. NFIP regulations do not allow basements to extend below the base flood elevation (BFE) except in dry-floodproofed, non-residential buildings.
- **Enclosed area (enclosure):** An area below an elevated building that is enclosed by walls on all sides.
- **Lowest floor:** Lowest floor of the lowest enclosed area of a building, including basement. An unfinished or flood-resistant enclosure that is used solely for parking of vehicles, building access, or storage is not the lowest floor, provided the enclosure is built in compliance with applicable requirements.
- **Net open area:** Permanently open area of a non-engineered flood opening.
- **Special Flood Hazard Area (SFHA):** Area subject to flooding by the base flood (1-percent-annual-chance flood) and shown on Flood Insurance Rate Maps (FIRMs) as Zone A or Zone V.
- **Zone A:** Flood zones shown on FIRMs as Zone A, AE, A1-30, AH, AO, A99, and AR.
- **Zone V:** Flood zones shown on FIRMs as Zone V, VE, V1-30, and VO.

2 National Flood Insurance Program Regulations

An important NFIP objective is protecting buildings constructed in SFHAs from damage caused by flooding. The SFHA, composed of Zones A and V, is the areal extent of the base flood shown on Flood Insurance Rate Maps (FIRMs) prepared by FEMA. The base flood is the flood that has a 1 percent chance of being equaled or exceeded in any given year (commonly called the "100-year" flood).

The NFIP floodplain management regulations include minimum building design criteria that apply to:

- New construction
- Work determined to be Substantial Improvements, including improvements, alterations, and additions
- Repair of buildings determined to have incurred Substantial Damage

A defining characteristic of the NFIP regulations applicable in Zone A is the requirement for the lowest floor (including basement) to be elevated to or above the BFE. Non-residential buildings in Zone A must be elevated or dry floodproofed. The requirements in Zone V, not addressed in this Technical Bulletin, also specify building elevation, foundation, and enclosure requirements.

Enclosed areas (enclosures) are permitted below elevated buildings if the enclosed areas meet requirements, including limitations on use (parking of vehicles, building access, or storage), use of flood damage-resistant materials, and installation of flood openings that allow automatic entry and exit of floodwater (i.e., free inflow and outflow in both directions) to equalize the hydrostatic flood loads.

The NFIP regulations for enclosures and flood openings are codified in Title 44 of the Code of Federal Regulations (CFR) Part 60. Specific to NFIP Technical Bulletin 1, 44 CFR § 60.3(c)(5) states that a community shall:

> Require, for all new construction and substantial improvements, that fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria: A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

NFIP REQUIREMENTS AND HIGHER REGULATORY STANDARDS

State or Local Requirements. State or local requirements that are more restrictive or stringent than the minimum requirements of the NFIP take precedence. The Technical Bulletins and other FEMA publications provide guidance on the minimum NFIP requirements and describe best practices. Design professionals, builders, and property owners should contact local officials to determine whether more restrictive requirements apply to buildings or sites in question. All other applicable requirements of state or local building codes must also be met for buildings in flood hazard areas.

Substantial Improvement and Substantial Damage. As part of issuing permits, local officials must review not only proposals for new construction but also for work on existing buildings to determine whether the work constitutes Substantial Improvement or repair of Substantial Damage. If the work is determined to constitute Substantial Improvement or repair of Substantial Damage, the buildings must be brought into compliance with the NFIP requirements for new construction. Some communities modify the definitions of Substantial Improvement and/or Substantial Damage to be more restrictive than the NFIP minimum requirements. For more information on Substantial Improvement and Substantial Damage, see FEMA P-758, *Substantial Improvement/Substantial Damage Desk Reference* (2010), and FEMA 213, *Answers to Questions About Substantially Improved/Substantially Damaged Buildings* (2018).

Elevation Above Minimum NFIP Requirements. Some communities require that buildings be elevated above the NFIP minimum requirement. The additional elevation is called freeboard. Design professionals, builders, and property owners should check with local officials to determine whether a community has freeboard requirements. References to building elevations in this Technical Bulletin should be construed as references to the community's elevation requirement where freeboard is required.

Legal Nonconforming Buildings. Owners of older, legal nonconforming buildings that are elevated with enclosures below the BFE may wish to retrofit the enclosures to conform to current requirements for enclosures, even when the enclosure is below grade on all sides. Lower NFIP flood insurance rates may apply if retrofit enclosures have flood openings that meet the requirements in this Technical Bulletin and other requirements for enclosures (e.g., limited use, flood damage-resistant materials, elevated utilities).

3 Building Codes and Standards

In addition to complying with the NFIP requirements, all new construction, Substantial Improvements, and repair of Substantial Damage must comply with the applicable building codes and standards adopted by states and communities.

The International Codes® (I-Codes®), published by the International Code Council® (ICC®), are a family of codes that includes the International Residential Code® (IRC®), International Building Code® (IBC®), International Existing Building Code® (IEBC®), and codes that govern the installation of mechanical, plumbing, fuel gas service, and other aspects of building construction. FEMA has deemed that the latest published editions of the I-Codes meet or exceed NFIP requirements for buildings and structures in flood hazard areas. Excerpts of the flood provisions of the I-Codes are available on FEMA's Building Code Resource webpage (https://www.fema.gov/building-code-resources).

3.1 International Residential Code

The IRC applies to one- and two-family dwellings and townhomes not more than three stories above grade plane. The IRC requirements related to flood openings, summarized in Table 1, are similar to but generally exceed NFIP requirements.

Table 1 refers to selected requirements of the 2018 IRC and notes changes from the 2015 and 2012 editions; subsequent editions of the IRC should include comparable requirements.

IRC COMMENTARY

The ICC publishes companion commentary for the IRC. Although not regulatory, the commentary provides guidance that is useful in complying with, interpreting, and enforcing the requirements of the code.

Table 1: Comparison of Selected 2018 IRC and NFIP Flood Opening Requirements

Topic	Summary of Selected 2018 IRC Requirements and Changes from 2015 and 2012 Editions	Comparison with NFIP Requirements
Flood openings	**Section R322.2.2(2) Enclosed area below design flood elevation.** Requires enclosed areas below the design flood elevation, including crawlspaces, to have flood openings (non-engineered or engineered) that meet listed criteria and that are installed in accordance with R322.2.2.1. The enclosed area is measured on the exterior of the enclosure. The listed criteria are equivalent to non-engineered and engineered openings, with the addition of a minimum size (not less than 3 inches in any direction in the plane of the wall). Change from 2015 to 2018 IRC: No change. Change from 2012 to 2015 IRC: No change.	Equivalent to NFIP 44 CFR § 60.3(c)(5) but with more specificity: measurement of enclosed area and minimum dimensions of opening.
Installation of flood openings	**Section R322.2.2.1 Installation of openings.** Specifies the following for the installation of flood openings: • At least two openings on different sides of an enclosure are required, and if more than one enclosed area is present, each must have openings on exterior walls. • The bottom of each opening must be not more than 1 foot above the higher of the final interior grade (or floor) and the finished exterior grade immediately under each opening. • Openings are permitted to be installed in doors and windows. Change from 2015 to 2018 IRC: No change. Change from 2012 to 2015 IRC: Installation requirements moved to new section.	More specificity than NFIP 44 CFR § 60.3(c)(5): openings on different sides, openings installed above higher of interior and exterior grade or floor, and openings installed in doors.
Breakaway walls	**Section R322.3.5 Walls below design flood elevation.** Requires walls below elevated dwellings in Coastal High Hazard Areas (Zone V) and Coastal A Zones that are intended to break away under flood loads to have flood openings that meet the requirements of Section R322.2.2(2). Change from 2015 to 2018 IRC: Section number was R322.3.4. Change from 2012 to 2015 IRC: New requirement in Coastal High Hazard Areas (Zone V) and Coastal A Zones if delineated.	Exceeds NFIP 44 CFR § 60.3(e)(5): openings in breakaway walls and Zone V requirements applied in Coastal A Zones if delineated.

3.2 International Building Code and ASCE 24

The flood provisions of the latest published editions of the IBC meet or exceed NFIP requirements for buildings, largely through reference to the standard ASCE 24, *Flood Resistant Design and Construction*, developed by the American Society of Civil Engineers (ASCE). The IBC applies to all applicable buildings and structures. While primarily used for buildings and structures other than dwellings within the scope of the IRC, the IBC may be used to design dwellings. ASCE 24 requirements for flood openings, summarized in Table 2, are similar to but generally exceed and are more specific than NFIP requirements. Table 2 refers to selected requirements of the 2018 IBC and ASCE 24-14 (noting changes from 2015 and 2012 IBC and ASCE 24-05); subsequent editions of the IBC and ASCE 24 should include comparable requirements.

IBC AND ASCE 24 COMMENTARIES

The ICC publishes companion commentary for the IBC, and ASCE publishes companion commentary for ASCE 24. Although not regulatory, the commentaries provide guidance that is useful in complying with, interpreting, and enforcing the requirements.

Table 2: Comparison of Selected 2018 IBC and ASCE 24-14 Flood Opening Requirements with NFIP Requirements

Topic	Summary of Selected 2018 IBC/ASCE 24-14 Requirements and Changes from 2015 and 2012 IBC/ASCE 24-05	Comparison with NFIP Requirements
Certification of engineered openings	**Section 1612.4(1.2).** Requires submission of a certification statement that the design provides for equalization of hydrostatic flood forces in accordance with ASCE 24, Section 2.7.2.2 (for engineered openings), if flood openings do not meet the requirements of ASCE 24, Section 2.7.2.1 (for non-engineered openings). Change from 2015 to 2018 IBC: Section number was 1612.5. Change from 2012 to 2015 IBC: No change.	Equivalent to NFIP 44 CFR § 60.3(c)(5).
Breakaway walls	**ASCE 24 Section 2.7.1.1.** Requires openings in breakaway walls. Change from ASCE 24-05: New requirement for openings in breakaway walls in Coastal High Hazard Areas and Coastal A Zones.	Exceeds NFIP 44 CFR § 60.3(e)(5) by requiring openings in breakaway walls.
Non-engineered openings	**ASCE 24 Section 2.7.2.1.** Specifies non-engineered openings, requires enclosed areas to be measured on the exterior, specifies minimum size (not less than 3 inches in any direction in the plane of the wall), and requires that the presence of louvers, blades, screens, faceplates or other covers, and devices be accounted for in determining net open area. Change from ASCE 24-05: Specifies measurement of enclosed areas to determine square footage. Clarifies that the presence of louvers, blades, screens, faceplates, and devices must be accounted for in the measurement of net open area of flood openings.	Equivalent to NFIP 44 CFR § 60.3(c)(5) but with more specificity: measurement of enclosure area, minimum dimension of openings, and measurement of net open area.
Engineered openings	**ASCE 24 Section 2.7.2.2.** Specifies engineered openings with emphasis on performance accounting for the presence of louvers, blades, screens, grilles, faceplates or other covers, and devices and ensuring that the difference between exterior and interior flood levels does not exceed 1 foot, with guidance related to the rate of rise and fall in excess of (or less than) 5 feet per hour. Specifies minimum size (not less than 3 inches in any direction in the plane of the wall). Provides the formula for calculating the total net area of required engineered openings. Change from ASCE 24-05: Greater emphasis on performance and the effects of louvers, blades, screens, grills, faceplates, and devices and revises the table of coefficients of discharge	Equivalent to NFIP 44 CFR § 60.3(c)(5) but with more specificity: minimum rate of rise and fall, minimum dimension of openings, and formula for engineered openings.
Installation of flood openings	**ASCE 24 Section 2.7.3.** Specifies the following for the installation of openings: • At least two openings in at least two walls of each enclosed area • The bottom of each opening not more than 1 foot above the higher of the final interior grade or floor and the finished exterior grade immediately under each opening • Openings in doors and windows permitted Change from ASCE 24-05: Consolidates installation requirements, which apply to both non-engineered and engineered openings, and clarifies that the position is relative to the higher of the interior and exterior grade or floor.	Equivalent to NFIP 44 CFR § 60.3(c)(5) but with more specificity: openings on different sides, bottom of openings above higher of interior and exterior grade or flood, and openings in doors and windows.

4 NFIP Flood Insurance Implications

Careful attention to compliance with NFIP requirements for enclosures below elevated lowest floors and flood openings is important during the design, plan review, construction, and inspection of buildings in SFHAs. Compliance influences vulnerability to flood damage and also the cost of NFIP flood insurance policies. The presence of enclosures may result in higher NFIP flood insurance premiums. If flood openings are not compliant, the floor of a crawlspace or the floor of an enclosure will be deemed the lowest floor for insurance rating purposes, which may result in higher NFIPflood insurance premiums, especially if the floor of the crawlspace or enclosure is more than 1 foot below the BFE.

5 Documenting Building Elevations and Flood Openings Using the NFIP Elevation Certificate

Communities are required to obtain the following from permit holders for buildings in SFHAs: the surveyed elevation of lowest floors of new buildings and buildings that have been Substantially Improved or repaired after incurring Substantial Damage. The elevations may be provided on the NFIP Elevation Certificate or in other formats.

The NFIP Elevation Certificate is designed to facilitate the collection of information that will help local officials evaluate compliance with floodplain management requirements and to provide the information necessary for the proper rating of NFIP flood insurance policies. For guidance on completing the certificate, see *NFIP Elevation Certificate and Instructions* (FEMA, 2015) and FEMA 467-1, *Floodplain Management Bulletin: Elevation Certificate* (FEMA, 2004).

The required information includes the following characteristics of crawlspaces, enclosures, and attached garages:

- Square footage of the enclosed area, measured on the outside of the enclosure walls
- Number of permanent flood openings within 1.0 foot above adjacent grade
- Total net open area of flood openings
- Whether engineered openings are used

According to the NFIP Elevation Certificate instructions, when an enclosed area has no flood openings or if all flood openings (non-engineered

NFIP ELEVATION CERTIFICATE COMMENTS

The comment section of the NFIP Elevation Certificate should be used to note characteristics of enclosures and flood openings that comply with the requirements but that, without close inspection, may appear to be non-compliant. In particular, without clarifying comments on engineered openings, local officials and insurance agents may inadvertently determine that enclosures are non-compliant and deem the floor of the enclosure the lowest floor, resulting in unnecessarily high NFIP flood insurance premiums.

or engineered) are higher than 1.0 foot above the adjacent grade, "N/A" (not applicable) should be entered for both the number of flood openings within 1.0 foot above adjacent grade and total net open area of flood openings. If the bottoms of some flood openings are within 1.0 foot above the adjacent grade, only the number and net open area of those openings should be recorded (openings that are higher than 1.0 foot are not included).

The certificate does not require users to determine whether any portion of a flood opening is above the BFE. However, for compliance purposes, see Section 8.3.6 of this Technical Bulletin for guidance on flood openings that extend above the BFE, which can occur in areas with shallow flooding. In these areas, even if the bottom of an opening is less than 1.0 foot above grade, a portion of the opening may extend above the BFE.

The NFIP Elevation Certificate has space for comments. Comments must be entered when engineered openings are used. Section 9.3.2 of this Technical Bulletin describes the documentation that is required for engineered openings and that must be attached to the certificate.

6 Use of Enclosed Areas Below Elevated Buildings

The NFIP regulations specify that enclosed areas under elevated buildings in SFHAs may be allowed if the enclosed areas are used solely for:

- Parking of vehicles (attached garages or parking areas below elevated buildings)
- Building access (stairwells, foyers)
- Storage (recommended to be limited to storage of low-value items)

The NFIP regulations do not list crawlspaces and under-floor spaces as allowable uses of enclosed areas. However, buildings in Zone A may be elevated using perimeter foundation walls that create these enclosed areas. Crawlspaces and under-floor spaces provide access to under-floor utilities such as pipes, ductwork, and electric conduits.

DRY FLOODPROOFED BUILDINGS

The only buildings with enclosed areas that are not required to have flood openings are non-residential buildings that are engineered to be dry floodproofed. For information on dry floodproofing, see FEMA P-936, *Floodproofing Non-Residential Buildings* (FEMA, 2013), and NFIP Technical Bulletin 3, *Non-Residential Floodproofing – Requirements and Certification*. FEMA has granted exceptions to a small number of communities to allow engineered, dry-floodproofed basements in specific circumstances.

A compliant enclosed area below the BFE can be rendered non-compliant by installing features that are inconsistent with the limitations on uses. Examples of features that are not allowed below the BFE are:

- Appliances
- Heating and air conditioning equipment
- Ventilation
- Ductwork
- Plumbing fixtures
- Materials that are not flood damage-resistant materials
- More than the minimum electric service required to address life-safety and electric code requirements for vehicle parking, building access, or storage

NON-CONVERSION AGREEMENTS

When some communities issue permits for buildings with enclosed areas below the BFE, permittees are required to execute Non-Conversion Agreements. These agreements document the permittees' understanding that the allowed use of enclosures is limited, that conversion to other uses is not allowed, and that modifying enclosed areas may render a building non-compliant with minimum requirements and result in higher NFIP flood insurance rates.

7 Foundation Walls and Enclosure Walls that Require Flood Openings

The NFIP regulations require that enclosed areas below the lowest floors of elevated buildings in Zone A have flood openings to equalize the hydrostatic flood forces (loads) on the enclosure walls. This requirement applies whether the walls are crawlspace, load-bearing, or non-load-bearing walls.

Examples of foundation and enclosure walls that require openings are listed below and described in Sections 7.1 through 7.9.

- Solid perimeter foundation walls (crawlspaces and under-floor spaces)
- Solid perimeter foundation walls (below-grade crawlspaces)
- Garages attached to elevated buildings
- Enclosed areas under buildings elevated on open foundations
- Enclosed areas with breakaway walls under buildings elevated on open foundations
- Above-grade (elevated) enclosed areas
- Two-level enclosed areas
- Solid perimeter foundation walls on which manufactured homes are installed
- Accessory structures (detached garages and storage sheds)

7.1 Solid Perimeter Foundation Walls (Crawlspaces and Under-Floor Spaces)

The crawlspace or under-floor space that is created when a building is elevated on a solid perimeter foundation wall that is below the BFE (see Figure 2) must meet all of the requirements for enclosed areas, including flood openings. If brick veneer, siding, or other material covers the wall, the openings in the wall must penetrate into the enclosed area. A crawlspace access door does not qualify as a flood opening unless the door has an opening installed in it or otherwise meets the performance requirement to allow automatic entry and exit of floodwater.

CONDITIONED CRAWLSPACES MUST HAVE FLOOD OPENINGS

In many parts of the country, a common practice is to build "conditioned crawlspaces" that are sealed and have mechanical ventilation. In SFHAs, all crawlspaces must have flood openings that meet the NFIP requirements and building codes.

Section 8.2 of this Technical Bulletin explains that the bottom of each opening must be no higher than 1 foot above the higher of the finished interior grade (or floor) or the finished exterior grade immediately under the opening. Therefore, the expected finished exterior grade and the final interior grade (or floor) of a crawlspace must be known before the location of the openings in a perimeter foundation wall can be determined.

Building codes may require ventilation of under-floor spaces. Ventilation openings are typically positioned near the top of the foundation wall to facilitate air flow. In most cases, ventilation openings are too far above grade to satisfy flood opening requirements.

In SFHAs where BFEs are several feet above grade or when owners want enough head room in an under-floor space to allow for parking of vehicles and storage, solid perimeter foundation walls may be used to create a full-height, under-floor space (see Figure 3). The walls surrounding an under-floor space must meet all flood-opening requirements.

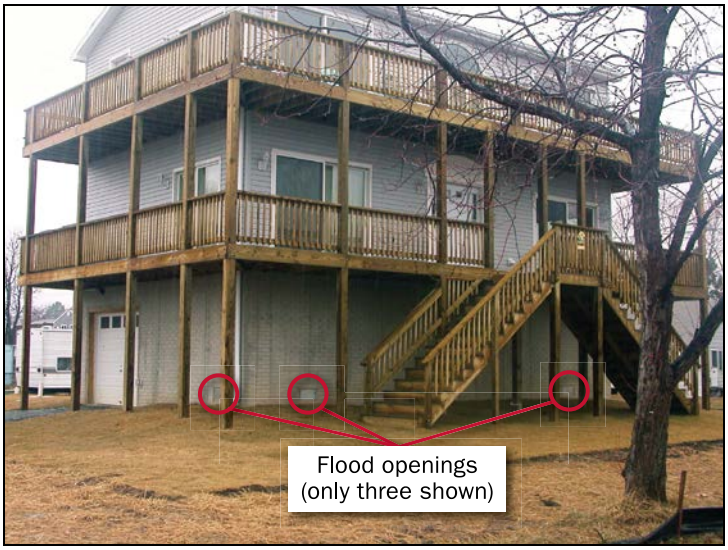


Figure 3: Full-height, solid perimeter walls surrounding a garage and storage area with flood openings (only three openings are shown)

Full-height, under-floor spaces must also meet all other NFIP requirements, which will minimize the likelihood of future conversion to uses other than the allowed uses (parking of vehicles, building access, or storage). Features that are inconsistent with the allowed uses are not permitted (see Section 6).

A backfilled stem wall foundation (also called chain wall, raised-slab-on-grade, and slab-on-stem-wall-with-fill) can look like a solid perimeter foundation wall from the outside, but a backfilled stem wall foundation is backfilled with compacted structural fill, concrete, or gravel that supports the floor slab (see Figure 4). Because stem wall foundations are backfilled, flood openings are not required and should not be installed.

BACKFILLED STEM WALLS AND NFIP ELEVATION CERTIFICATES

When the NFIP Elevation Certificate for a building elevated on a backfilled stem wall is completed, the foundation should be described in the comment section to clarify that the foundation is not a crawlspace and therefore does not require and should not have flood openings.

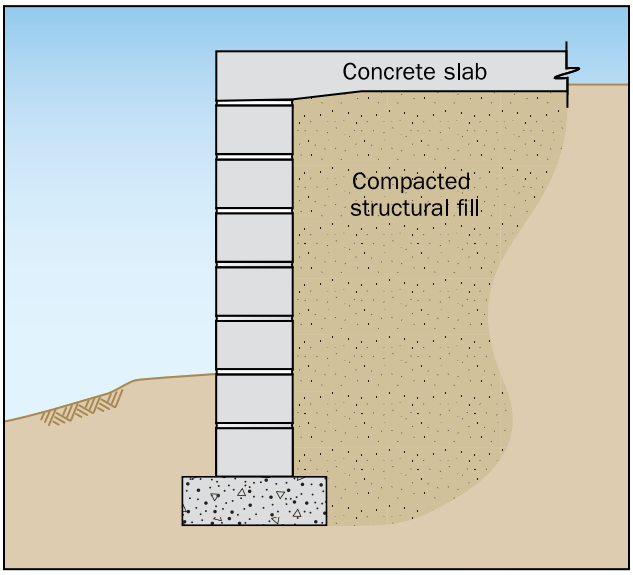


Figure 4: Backfilled stem wall foundation; flood openings not required

7.2 Solid Perimeter Foundation Walls (Below-Grade Crawlspaces)

The NFIP regulations do not allow buildings in SFHAs to have basements (areas below grade on all sides) except for engineered, non-residential buildings in Zone A that are designed and certified to be dry floodproofed. Therefore, crawlspaces that are below grade on all sides are not allowed because they are basements. An exception is available **only in SFHAs with shallow flooding** and then only if specific requirements and limitations are met. For more information,

LIMITATIONS ON BELOW-GRADE CRAWLSPACES

Before authorizing below-grade crawlspaces, communities are required to adopt specific provisions in their ordinances to be consistent with the limitations specified in NFIP Technical Bulletin 11. Communities should consult NFIP State Coordinators or FEMA Regional Offices for the appropriate language.

see NFIP Technical Bulletin 11, *Crawlspace Construction for Buildings Located in Special Flood Hazard Areas: National Flood Insurance Program Interim Guidance.*

According to Technical Bulletin 11, below-grade crawlspaces may be allowed if the foundation wall height is less than 4 feet from the bottom of the floor joist/truss to the top of the footing or interior grade/floor (whichever is higher). The top of the footing or interior grade/floor must be no more than 2 feet below grade (see Figure 5). Flood openings are required in the foundation walls surrounding below-grade crawlspaces and, as noted in Section 7.1, ventilation may be required. Because below-grade crawlspaces may contribute to increased humidity and mold growth, Technical Bulletin 11 requires that below-grade crawlspaces have adequate drainage systems to minimize moisture damage.

Although crawlspaces that meet the limitations in Technical Bulletin 11 are not considered basements for floodplain management purposes, they are considered basements for NFIP flood insurance purposes, and premiums will be higher if the grade inside a crawlspace is below the exterior grade on all sides.

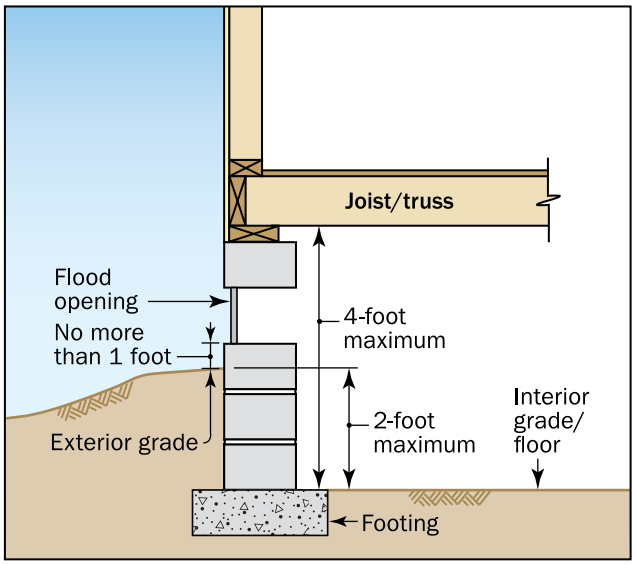


Figure 5: Limitations on below-grade crawlspaces in shallow flood hazard areas (see NFIP Technical Bulletin 11 for more information)

7.3 Garages Attached to Elevated Buildings

Many buildings, especially homes, have an attached garage that extends laterally from the building and may or may not have living space above it. The floor of a garage that is attached to a building in an SFHA is allowed to be below the BFE if the garage meets all of the requirements for an enclosed area below the BFE. The use of the garage space must be limited to parking of vehicles, building access, or storage.

Flood openings are required in the exterior walls of garages in Zone A. Openings may be installed in garage doors (see Figure 6). However, because garage doors are likely to be replaced over the life of a building and subsequent owners may inadvertently replace garage doors without openings, flood openings should be installed in garage doors only when there is insufficient wall area in which to install the required number of openings.

Garage doors themselves do not meet the requirements for openings because human intervention would be needed to open garage doors when flooding is expected. Human intervention is inconsistent with the requirement that openings allow for the automatic entry and exit of floodwater. Garage doors with mechanisms that open the doors when water is detected do not meet the requirements because electric service cannot be guaranteed even if a backup power source is provided. Similarly, gaps that may be present between the garage door and the door jamb or walls do not guarantee automatic entry and exit of floodwater and do not count toward the net open area requirement.

Figure 6: Engineered openings in garage doors

7.4 Enclosed Areas Under Buildings Elevated on Open Foundations

A building that is elevated on an open foundation (e.g., piers, posts, columns, pilings) in Zone A may have enclosed areas below the elevated floor (see Figure 7). Sometimes, only part of the footprint is enclosed, such as for a stairwell or storage room. All of the requirements for enclosed areas apply. Requirements include openings, elevated utilities, flood damage-resistant materials, and limitations on use (parking of vehicles, building access, or storage).

Skirting used to enclose areas under manufactured homes or other elevated buildings is typically made of weather-resistant material and extends from the bottom of the floor system down to grade. Rigid vinyl and aluminum skirting must have flood openings. Flood openings are not required when flexible skirting is used, but flexible skirting may be pushed against foundations if floodwater rises rapidly, in which case open lattice may be more appropriate. Unattached skirting can become dislodged during flooding and generate damaging debris.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) INSTALLATION STANDARD AND SKIRTING

NFPA 225, *Model Manufactured Home Installation Standard* (NFPA, 2017), specifies that the installation of skirting does not trigger the requirement for flood openings if the skirting does not provide structural support and would collapse under wind and water loads that are less than those expected during the base flood event without causing structural damage to the elevated home or foundation.

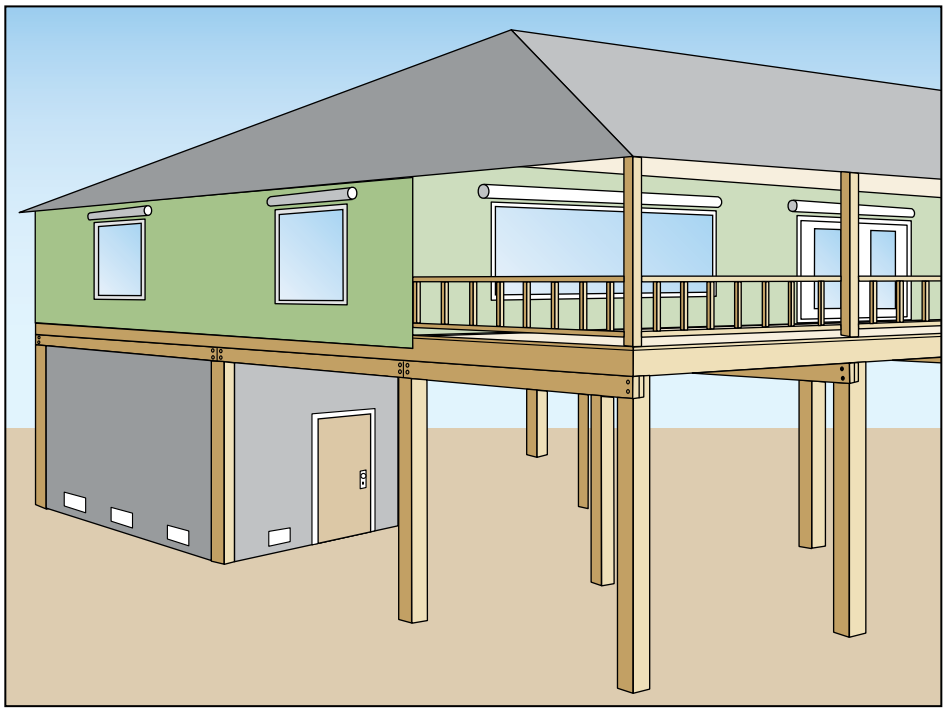


Figure 7: Enclosure with flood openings under a house elevated on pilings

UTILITY CHASES

For floodplain management and NFIP flood insurance purposes, utility chases designed to protect utility lines from freezing are not considered enclosures. Utility chases must be small and not allow access for a person to enter the space (access panels for servicing the lines are appropriate).

Because a utility chase is not considered an enclosure, it does not have to have flood openings (but flood openings may be provided). The utility chase must be constructed of flood damage-resistant materials below the BFE, and the enclosed utility lines must meet the requirement to be watertight and capable of withstanding flood loads (hydrostatic, hydrodynamic, wave).

7.5 Enclosed Areas with Breakaway Walls Under Buildings Elevated on Open Foundations

Open foundations (e.g., piers, posts, columns, pilings) are recommended in riverine SFHAs where flow velocities are expected to exceed 10 feet per second and in coastal areas where breaking wave heights during base flood conditions are expected to be between 1.5 and 3 feet (called Coastal A Zones). Buildings in these areas may be exposed to significant hydrodynamic loads, debris impact, and scour, any of which could be sufficient to damage typical perimeter foundation walls and enclosure walls even when there are flood openings.

Many Flood Insurance Rate Maps (FIRMs) for coastal communities that have been revised since 2009 show a Limit of Moderate Wave Action (LiMWA), which delineates the inland extent of the 1.5-foot wave. In Coastal A Zones, identified as Zone A on FIRMs, FEMA recommends that walls surrounding enclosed areas be designed as breakaway walls. To comply with the NFIP requirements, flood openings are required in breakaway walls in Zone A.

The NFIP regulations require that enclosures below elevated buildings in SFHAs identified as Zone V meet the same requirements for enclosures in Zone A, except that (1) walls must be non-supporting breakaway walls, open lattice-work, or insect screening and (2) flood openings are not required (see NFIP Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls*). The guidance in Technical Bulletin 9 should be used when flood openings are installed in breakaway walls to minimize wall failure under flooding that occurs more frequently than the base flood.

I-CODES AND COASTAL A ZONE

Starting with the 2015 editions, I-Codes treat Coastal A Zones like Zone V if the LiMWA is delineated on FIRMs or if communities designate Coastal A Zones. In addition, the I-Codes and ASCE 24-14 require flood openings in all breakaway walls, including those in Coastal A Zones and Zone V.

Post-flood assessments indicate that breakaway walls with openings prevent wall failure under frequent, shallow flood events. Preventing frequent wall failures reduces debris, keeps enclosure interiors and contents protected from wind-driven rain and sand, and reduces the cost of replacing walls.

7.6 Above-Grade (Elevated) Enclosed Areas

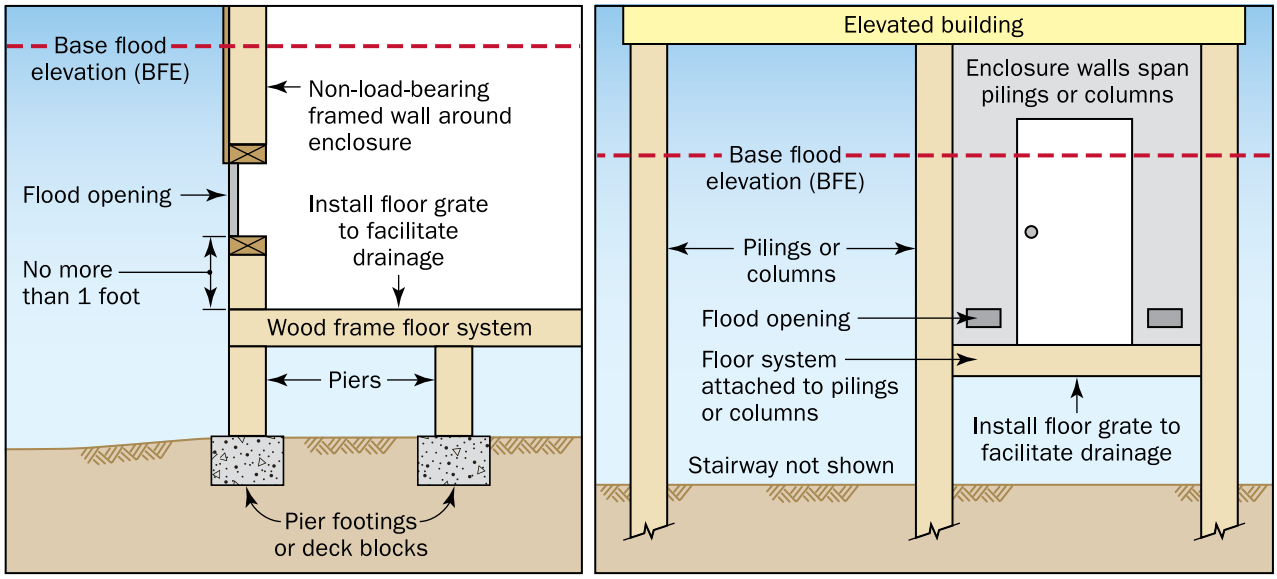
In flood hazard areas that experience frequent flooding, some owners construct enclosures with floor systems that are elevated above grade, not in contact with the ground, but still below the BFE (see Figure 8). Placing the enclosure floor above grade minimizes the potential for damage to the enclosure and contents during frequent, low-level flood events.

"HANGING ENCLOSURE"

The term "hanging enclosure" has been used to refer to raised, above-grade enclosures although above-grade enclosures are typically supported by other means and do not actually hang from elevated buildings.

Above-grade enclosures must meet all requirements applicable to enclosures (flood openings, flood damage-resistant materials, and used only for storage or building access). The floor system of above-grade enclosures may be independently supported on piers or posts, or enclosures may be structurally attached to the building's column or piling foundation. Although the floors of above-grade enclosures are not the lowest floor for floodplain management purposes, the enclosure floors are the lowest floor for NFIP flood insurance rating purposes.

One or more floor grates should be installed in the enclosure floor to reduce the potential for structural damage. Damage could result from buoyancy loads on the enclosure floors before water enters through the flood openings installed in walls. Openings in floors also allow enclosures to drain completely, reducing the potential for damage caused by the added weight of water.



Enclosure floor on piers under house supported on pilings or columns (pilings/columns not shown)

Enclosure floor attached to pilings or column

Figure 8: Above-grade enclosures

ABOVE-GRADE ENCLOSURES AND NFIP FLOOD INSURANCE

NFIP flood insurance policies for elevated buildings with above-grade enclosures are rated assuming the above-grade enclosure is the lowest floor (i.e., the floor of the enclosure instead of the floor of the elevated building). See the "Lowest Floor Guide" section of the *NFIP Flood Insurance Manual* (FEMA, 2019). Above-grade enclosures can result in higher NFIP flood insurance premiums than enclosures with floors that are at-grade or close to grade. Owners should ask their insurance companies to submit requests to the NFIP for a special rating for buildings with above-grade enclosures.

7.7 Two-Level Enclosed Areas

In flood hazard areas where the BFE is more than one story above the ground, some owners want to build two-level enclosures (see Figure 9). For compliance purposes, to avoid the second-level enclosure from being identified as the lowest floor, both enclosure levels must meet all of the requirements for enclosed areas, including openings, elevated utilities, flood damage-resistant materials, and limitations on use (parking of vehicles, building access, or storage). To facilitate drainage from the upper level of the enclosure, an opening with a grate should be installed in the floor.

TERMS USED FOR TWO-LEVEL ENCLOSURES

Two-level enclosures are also referred to as two-story enclosures, double enclosures, and stacked enclosures.

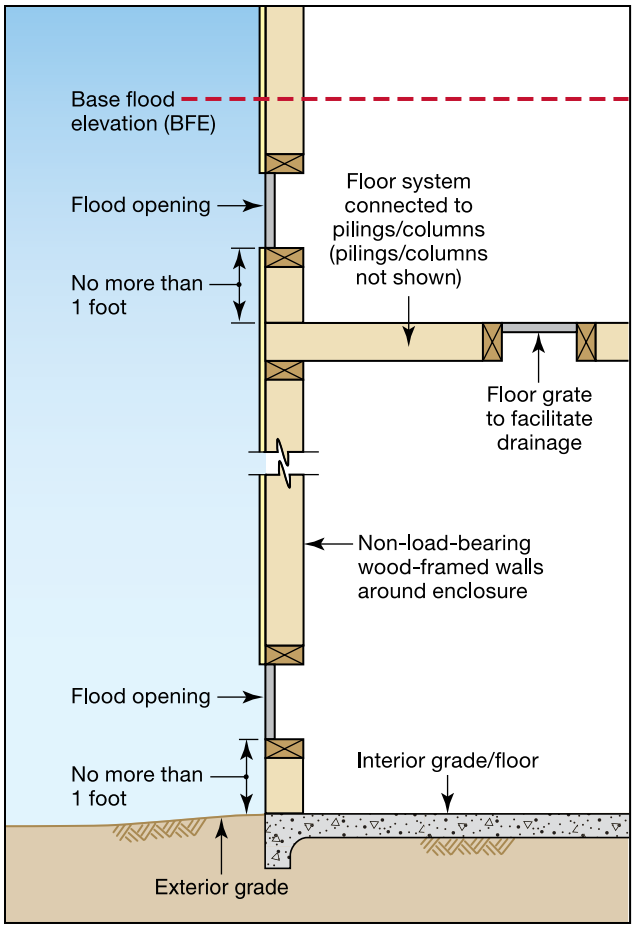


Figure 9: Two-level enclosure with non-load-bearing walls under building elevated on pilings or columns; configuration also applies if walls are load-bearing

Figure 9 shows a two-level enclosure in which the surrounding walls are not load-bearing; the same configuration and requirement apply if the surrounding walls are load-bearing perimeter walls.

Two-level enclosures are unusual and warrant consideration of flood loads based on site-specific flood conditions. Local officials may require that buildings with two-level enclosures be designed and certified by a registered design professional rather than rely on non-engineered foundations and enclosure configurations.

TWO-LEVEL ENCLOSURES AND NFIP FLOOD INSURANCE

Designers and owners should be aware that a building with a two-level enclosure, even if allowed by permit, will have a higher NFIP flood insurance premium than if the building has a one-level enclosure. Even if a two-level enclosure complies with building codes and floodplain management requirements for enclosures, the upper floor of the two-level enclosure will be deemed the lowest floor for insurance rating purposes (the lowest floor for flood insurance purposes is the first floor elevated above ground). Owners should ask their insurance companies to submit requests to the NFIP for a special rating for buildings with two-level enclosures.

7.8 Solid Perimeter Foundation Walls on which Manufactured Homes Are Installed

Manufactured homes may be installed on solid perimeter foundation walls that enclose the space below the homes (see Figure 10). Even if not part of a home's load-bearing support system, a solid perimeter foundation wall is required to have openings; otherwise, hydrostatic loads may damage the wall, which could lead to damage of the home's supporting foundation and anchor system.

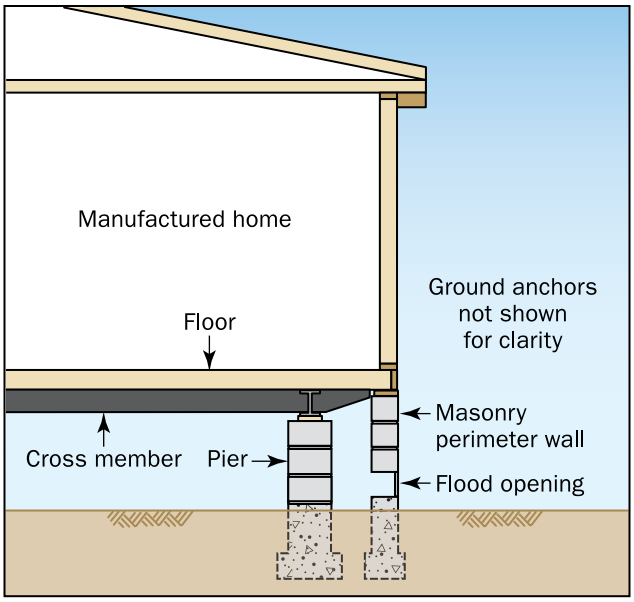


Figure 10: Manufactured home supported on interior piers and masonry perimeter wall with flood openings (ground anchors not shown)

7.9 Accessory Structures

Communities participating in the NFIP are required to regulate all development in SFHAs, including detached garages, detached storage buildings, and small storage sheds. Accessory structures may be elevated in accordance with the requirements for elevated buildings or dry floodproofed.

When communities have FEMA-approved limitations on the size of accessory structures or when communities grant variances for non-elevated accessory structures, the structures may be allowed without elevation provided the structures are wet floodproofed (see NFIP Technical Bulletin 7, *Wet Floodproofing Requirements for Certain Buildings Located in Special Flood Hazard Areas*). Alternatively, communities without FEMA-approved size limits may consider granting variances for non-elevated accessory structures in accordance with FEMA policies and guidance.

ADDITIONAL ACCESSORY STRUCTURE CONSIDERATIONS

Some communities have FEMA-approved regulations that specify limitations on the size of accessory structures that are allowed in SFHAs without having to comply with elevation requirements. Other considerations for accessory structures are set forth in FEMA policies and guidance.

Local officials should consult NFIP State Coordinators or FEMA Regional Offices for additional guidance and for appropriate size limits and language to include in local regulations.

Wet-floodproofed accessory structures must comply with the following measures:

- Use is limited to parking of vehicles and storage
- Utilities are elevated
- Materials below the BFE are flood damage-resistant materials
- Flood opening requirements are satisfied
- Structures are anchored to resist flotation, collapse, or lateral movement under flood conditions

A best practice is to require Non-Conversion Agreements when non-elevated accessory structures are allowed. These agreements, when recorded with property deeds, inform future owners about the limitations and the wet-floodproofing measures. Accessory structures that are allowed to be wet floodproofed must not be used for any habitable or other prohibited purpose.

8 Requirements and Guidance for Installation of Flood Openings

The NFIP regulations specify installation requirements for all flood openings, whether non-engineered or engineered. See Section 9 of this Technical Bulletin for information on non-engineered and engineered flood openings. Installation requirements specify the minimum number of openings and the maximum height of openings above grade. The requirements and guidance on installation are provided in Sections 8.1 through 8.3.

8.1 Location and Minimum Number of Flood Openings

Every enclosed area is required to have at least two flood openings on exterior walls. Flood openings should be installed in at least two sides of each enclosed area to decrease the chance that all openings will be blocked by floating debris and to allow for more even filling and drainage of enclosed areas than if openings are installed on only one side. FEMA recommends that openings be distributed around the perimeter of enclosed areas unless there is clear justification for putting all of the openings on only one or two sides, such as in townhouses with limited exterior walls (see Section 8.3.4) and buildings set into sloping sites (see Section 8.3.2). If openings are not distributed around the perimeter, an imbalance in flood loads could result in damage to or collapse of walls.

LOCATION OF FLOOD OPENINGS

The IRC and IBC (by reference to ASCE 24) require flood openings "on different sides of each enclosed area" (IRC R322.2.2.1) and "in at least two walls of each enclosed area" (ASCE 24, Section 2.7.3).

Figure 11 shows a foundation plan with multiple enclosures and openings in the perimeter wall of each enclosed area. Note that the number of openings shown is for illustration purposes only; the total number of openings and the adequacy of the net open area of the openings depend on the type of opening and whether air-vent devices or engineered openings are installed.

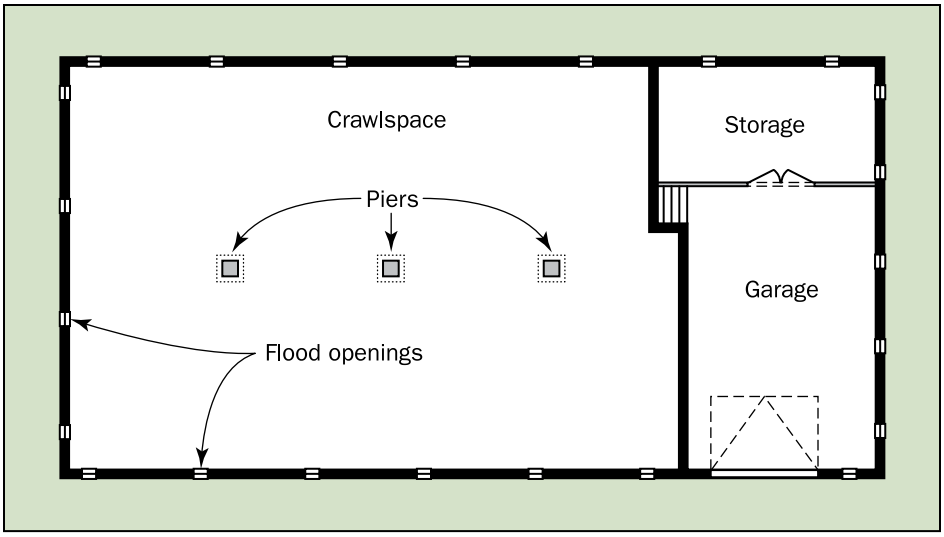


Figure 11: Foundation plan of home with multiple enclosed areas, each with flood openings (number of openings for illustration purposes only)

In some situations, openings in interior walls or partitions are necessary to ensure that floodwater can reach all enclosed areas and minimize unbalanced hydrostatic loads on interior and exterior walls. When openings are used in interior walls, the total number of openings and their net open area should be based on the size of the enclosed area, but openings in interior walls are not counted toward the required total opening requirement based on the exterior measurement of the enclosed area. To maintain safe fire separation, flood openings should not be placed in the wall separating a garage from living spaces and crawlspaces unless devices used as flood openings that are designed to satisfy fire-separation requirements are used.

8.2 Height of Flood Openings Above Grade or Floor

The bottom of each flood opening must be positioned no higher than 1 foot above the higher of the final (finished) interior or exterior grade or the floor that is immediately under each opening so water will begin to flow through the opening when water rises just above the bottom of the opening. The purpose of this requirement is to satisfy the performance expectation that the difference in water levels between the interior and exterior will not exceed 1 foot as floodwater begins to rise and as it recedes from the site. To reduce the amount of water trapped inside, a good practice is to install some openings closer to grade than the maximum 1 foot allowed. See Section 8.3.6 for information on openings that extend above the BFE in areas with shallow flooding.

When interior and exterior grades are different, the higher of (1) the finished exterior grade immediately under each opening and (2) the final interior grade or floor is used to determine

ENCLOSURES BELOW GRADE ON ALL SIDES ARE BASEMENTS

An enclosure that is below grade on all sides is a basement regardless of whether the interior grade or floor is below grade because backfill, topsoil, or landscaping materials were added or because the footing trenches inside the perimeter foundation walls are not completely backfilled. Basements do not comply with the minimum NFIP requirements. In addition, the presence of such below-grade enclosures will result in higher NFIP flood insurance premiums.

the position of flood openings. The following should be considered when determining which grade or floor to use:

- **Finished exterior grade.** Care should be taken when placing backfill, topsoil, or landscaping materials around the outside of enclosures, especially solid perimeter foundation walls. If the finished exterior grade is higher than the interior grade on all sides of the building, the enclosed area will be a basement as defined by the NFIP.
- **Final interior grade or floor.** The trench that is excavated to construct footings and foundation walls must be backfilled completely; otherwise, a basement will be created. If the interior grade or floor is higher than the exterior grade, the openings must be no higher than 1 foot above the interior grade or floor.

8.3 Examples of Flood Opening Installations

The following examples of flood opening installations are described in Sections 8.3.1 through 8.3.6:

- Interior grade or floor higher than the exterior grade
- Sloping sites
- Buildings with large enclosed areas
- Townhouses with limited exterior walls
- Buildings with multiple enclosures
- Openings in areas with shallow flooding

8.3.1 Interior Grade or Floor Higher than the Exterior Grade

This section describes enclosures in which the interior grade or floor is higher than the exterior grade. As water rises against the outside of the foundation, the interior fill or slab resists the hydrostatic load. When water rises above the interior grade or slab, the lateral load will become unbalanced and therefore must be equalized with openings that allow water to automatically enter and exit.

Figure 12 is an example of a framed enclosure below a manufactured home that is elevated on columns. As indicated by the driveway on the left, the interior slab is higher than the exterior grade along the side of the building. The flood openings are within 1 foot of the interior floor surface. Here, the full-height enclosed area is used for parking of vehicles and storage.

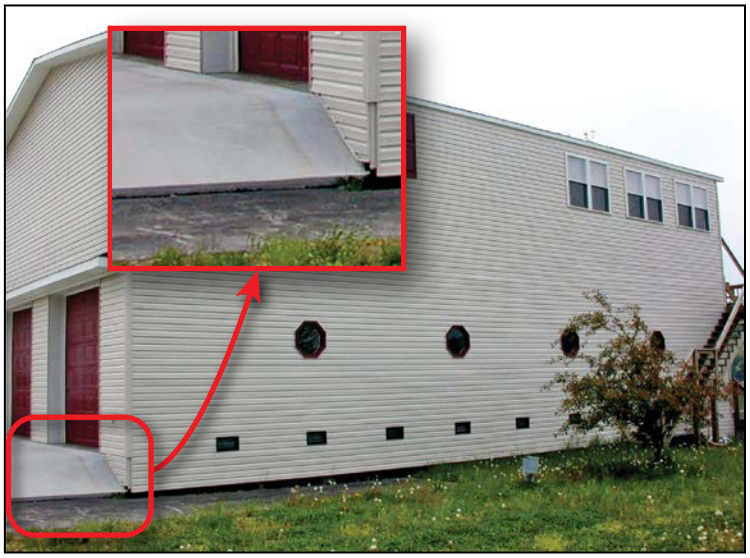


Figure 12: Manufactured home installed on columns above a full-height, framed garage (note elevation of thick driveway slab on left; the flood openings are within 1 foot of interior floor surface)

When viewed from the outside, an enclosure with the interior grade or floor higher than the exterior grade may appear non-compliant with the installation requirements for openings because the openings appear to be too high above the exterior grade. Therefore, the final documentation of as-built elevations should note the difference in interior and exterior grades. For example, if the NFIP Elevation Certificate is used, the comments should indicate whether the openings are (or are not) within 1 foot of the higher of the two grades and should explain that the interior grade or floor is higher than the exterior grade. Without the explanation, NFIP flood insurance premiums may be higher than necessary.

INTERIOR GRADE OR FLOOR ABOVE BFE

When the interior grade or floor of an enclosure below an elevated building is entirely above the BFE, flood openings are recommended but not required. When the floor of an enclosure is above the BFE, the NFIP flood insurance policy will be rated using the enclosure floor as the lowest floor rather than the next higher floor above the enclosure. Installing flood openings in these situations will result in lower NFIP flood insurance premiums.

8.3.2 Sloping Sites

Buildings on solid perimeter foundation walls set into sloping sites present a special situation for the installation of flood openings. Careful attention must be paid to the following:

- The interior grade or floor along the lowest side of the building must be at or above the exterior grade across the entire length of the lowest side, and there must be positive surface drainage away from the building; otherwise, the enclosure will be considered a basement as defined by the NFIP.
- The bottom of each opening must be no higher than 1 foot above the exterior or interior grade immediately below the opening, whichever is higher (see Figure 13).
- For flood openings to perform their intended function, they should be below the BFE.

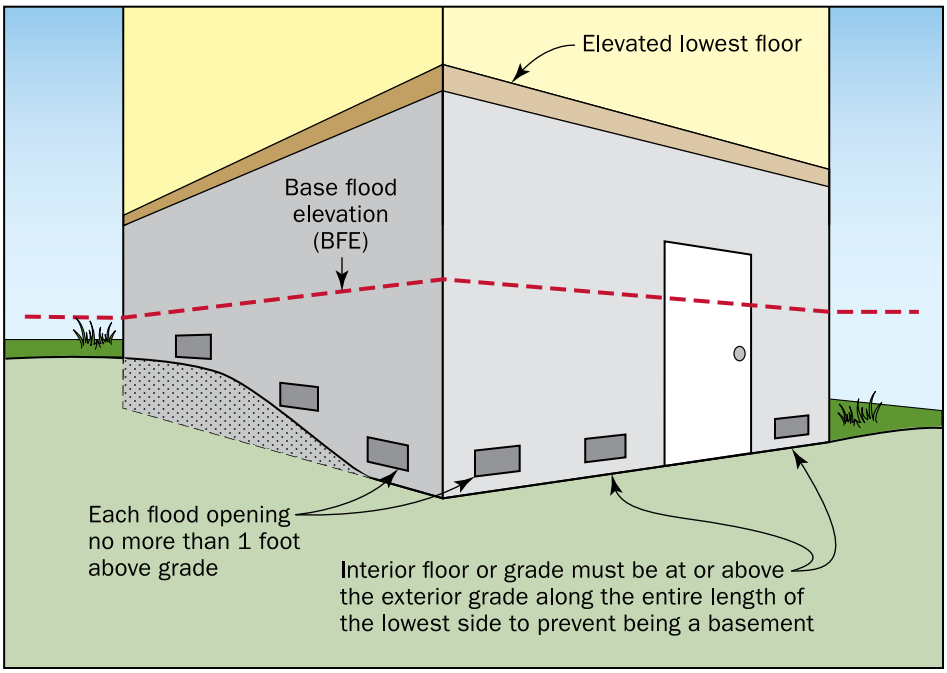


Figure 13: Flood openings in enclosure walls on a sloping site

- Interior partitions and load-bearing walls must have openings to allow water to readily reach every enclosed area (see Section 8.3.5 for information on buildings with multiple enclosures).

8.3.3 Buildings with Large Enclosed Areas

Some buildings, especially commercial and industrial buildings, have large under-floor spaces, crawlspaces, or enclosures. Flood openings may be stacked or grouped (see Figure 14), or large-dimension openings may be used, provided all of the requirements for openings are satisfied. Vertically stacked or closely spaced openings function together as one opening, and the bottom of the lowest opening must be no higher than 1 foot above the exterior grade or interior grade, whichever is higher.

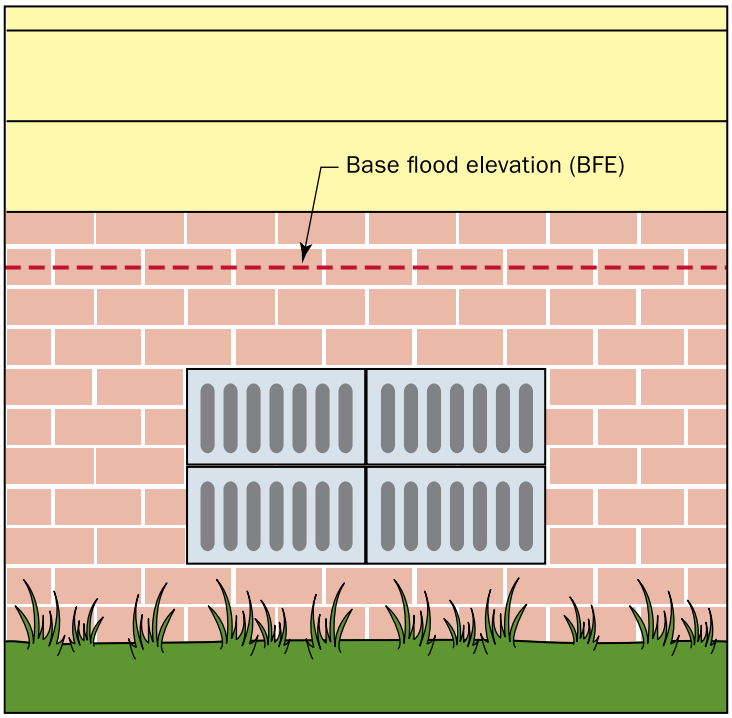


Figure 14: Flood openings that are stacked and closely grouped to satisfy the required total net open area

8.3.4 Townhouses with Limited Exterior Walls

Townhouses are single-family dwelling units constructed in groups of three or more attached units in which each unit extends from foundation to roof with exterior walls on at least two sides. Flood openings are required for townhouses in SFHAs that are constructed with solid perimeter foundation walls or solid walls surrounding enclosed areas under the elevated portion of the building.

Because interior townhouse units have less linear exterior wall length than end units, meeting all of the requirements for flood openings can be a challenge, especially the requirement for adequate opening area and the requirement that each enclosed area have openings. If openings cannot be provided in at least two exterior walls of each enclosed area, the NFIP allows all openings to be installed in one wall.

The design of interior townhouse units can satisfy the guidance that openings should be located on different sides of each enclosed area if interior partitions and walls have openings to connect enclosed spaces from front to back. Figure 15 shows suggested locations for openings. Note that the number of openings in Figure 15 is for illustration purposes only; the total number of openings and the adequacy of the opening area depend on the type of opening and whether non-engineered or engineered openings are installed. Fire-safety limitations generally preclude openings in the walls that separate townhouse units.

Providing adequate openings in enclosures below elevated townhouse units, other than end units, may be even more challenging if a multi-unit building is set into a sloping site. In this case, it may be appropriate to consider an open foundation or a backfilled stem wall foundation that does not require openings.

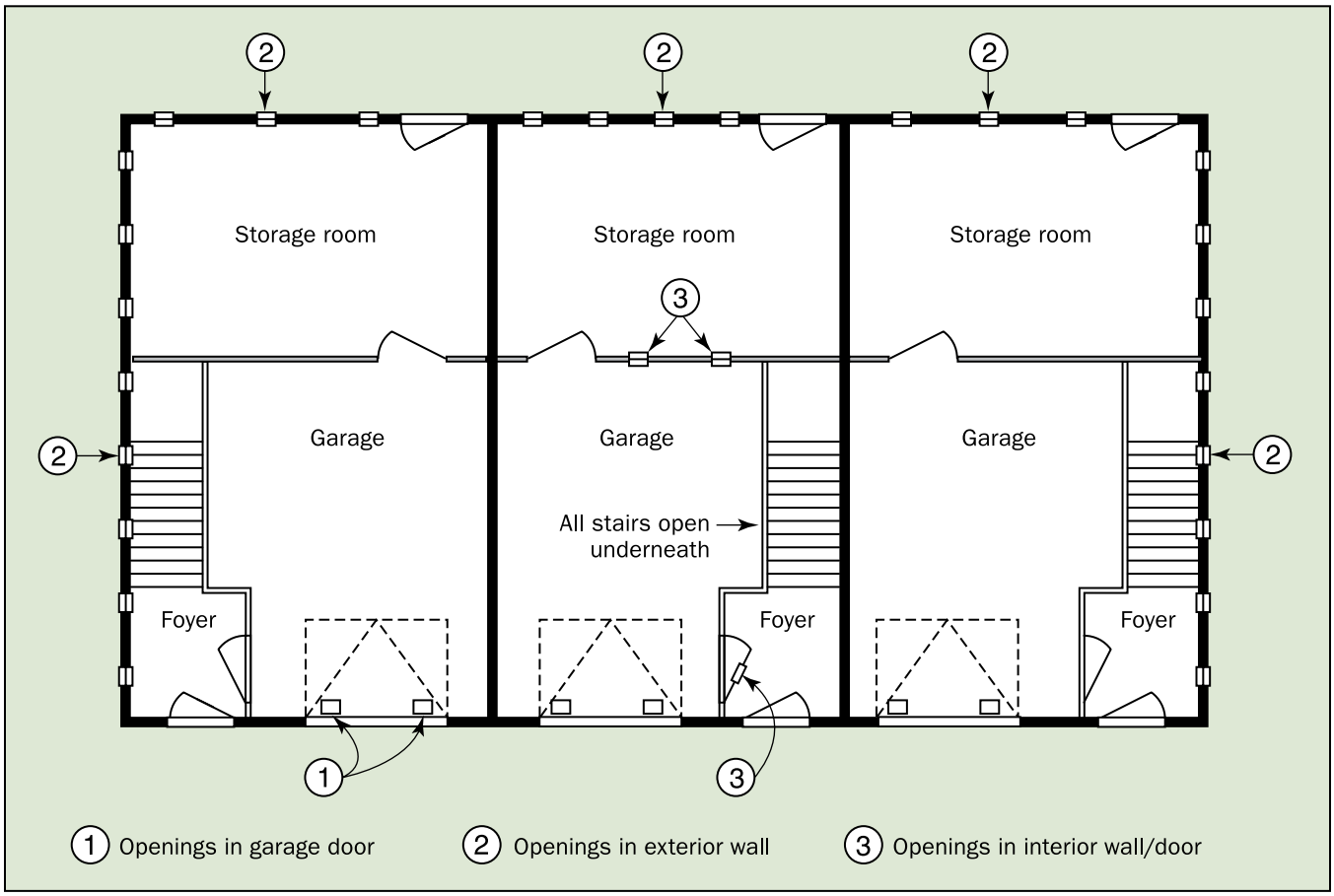


Figure 15: Suggested flood openings in enclosures under elevated townhouses (number of openings for illustration purposes only)

8.3.5 Buildings with Multiple Enclosures

Every enclosed area is required to meet the requirements for enclosures, including the requirement for flood openings in exterior walls. Figure 11 in Section 8.1 shows a home foundation plan with multiple enclosures. In some situations, openings in interior walls or partitions may be necessary to ensure that floodwater can reach all areas to minimize unbalanced hydrostatic loads on load-bearing interior walls and exterior walls (see middle townhouse in Figure 15 in Section 8.3.4). When openings are used in

interior walls, the total number of openings in exterior walls and the total opening area should be based on the size of the entire enclosed area. Openings in interior walls do not count toward the total opening requirements based on the exterior measurement of the enclosed area.

8.3.6 Flood Openings in Areas with Shallow Flooding

Some FIRMs show mapped SFHAs where the depth of floodwater above grade will be shallow (2 feet or less during the base flood). Shallow flooding occurs toward the landward boundary of SFHAs and in areas identified as being subject to sheet flow or ponding. The NFIP regulations require flood openings in enclosures even if the depth of flooding is only 1 foot and the difference in water depth between the inside and outside of enclosures is 1 foot or less.

NFIP ELEVATION CERTIFICATE AND SHALLOW FLOODING

The NFIP Elevation Certificate requires users to input the number of flood openings within 1.0 foot above the adjacent grade or floor. The certificate does not require users to determine how much of a flood opening is above or below the BFE.

Depending on the depth of floodwater in areas with shallow flooding, flood openings may extend above the BFE if the bottom of the opening is no higher than 1 foot above the higher of the final interior grade or floor and the finished exterior grade of the crawlspace or enclosure. When flood openings extend above the BFE, alternatives to satisfy the requirements include:

- Raise the floor of the enclosure to be at or above the BFE, perhaps by using a thicker slab, resulting in no need for openings. Although this alternative satisfies the construction requirement, for NFIP flood insurance rating purposes, the top of the slab is the elevation of the lowest floor, not the next higher floor (see the text box "Interior Grade or Floor above BFE" in Section 8.3.1).
- Install openings as close to grade (or floor) as possible to maximize the open area available for inflow and outflow of floodwater (see Figure 16). The total net open area of the openings must be based on the enclosed area even if some portion of the opening is above the BFE.

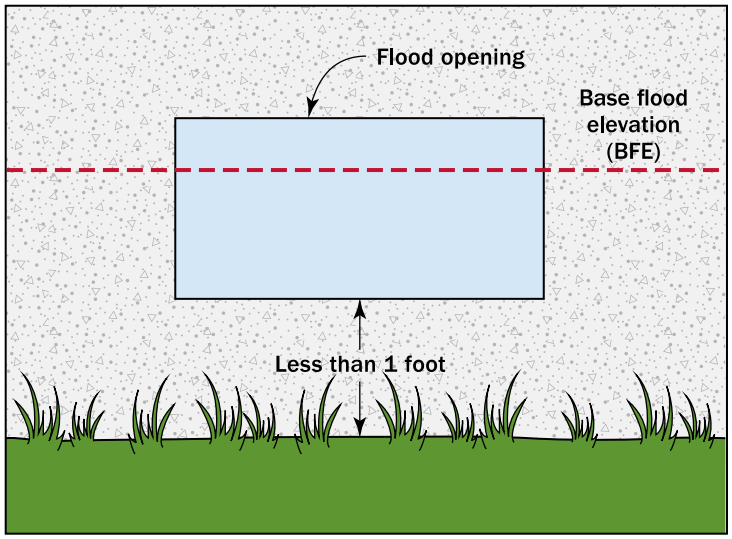


Figure 16: Bottom of the flood opening positioned as close as possible to grade (or floor) when any portion of the opening extends above the BFE

9 Non-Engineered Flood Openings and Engineered Flood Openings

The NFIP regulations, described in previous sections, identify options for providing sufficient size and number of flood openings to allow for the automatic (free) entry and exit of floodwater. This section describes how the automatic entry and exit of floodwater can be accomplished by the use of:

- Non-engineered openings that meet the prescriptive requirement to provide 1 square inch of net open area for each square foot of enclosed area, where the enclosed area is measured on the exterior of the enclosure walls. Section 9.2 describes a variety of options that can serve as non-engineered openings.
- Engineered openings for which Evaluation Reports are issued by the ICC Evaluation Service (ICC-ES), a subsidiary of the ICC, or equivalent reports issued by other product certification organizations.
- Engineered openings designed and certified by a registered design professional for a specific building and site-specific conditions.

All of the following requirements for installation apply regardless of whether engineered openings or non-engineered openings are used to satisfy the NFIP requirements (also see Section 8):

- Each enclosed area must have a minimum of two openings. When multiple enclosed areas are present, each area must have openings in its exterior walls. Section 8.3.5 describes connecting multiple areas by installing openings in interior walls or partitions to ensure that floodwater can reach all enclosed areas.
- The bottom of each opening must be no more than 1 foot above the higher of the final interior grade or floor or the finished exterior grade immediately under the opening.
- Insect screens, grates, grilles, fixed louvers, blades, faceplates, or other devices, if any, must not block the automatic flow of floodwater into and out of the enclosed area.

Section 9.1 provides a list of measures that are not acceptable as flood openings.

I-CODE REQUIREMENTS FOR FLOOD OPENINGS

The IRC includes requirements for non-engineered and engineered flood openings, and the IBC includes the same requirements by reference to ASCE 24.

FLOOD DAMAGE-RESISTANT MATERIALS

Flood openings must be made of flood damage-resistant materials in order to satisfy the requirement that materials used below the BFE be resistant to flood damage. Metals should be corrosion resistant, and plastics should be weather resistant. For guidance, see NFIP Technical Bulletin 2, *Flood Damage-Resistant Materials Requirements*.

9.1 Measures Not Acceptable as Flood Openings

FEMA has determined that the following measures do not satisfy the requirements for flood openings:

- Standard foundation air-ventilation devices that can be closed manually unless they are permanently disabled in the open position because otherwise, they do not allow for the automatic entry and exit of floodwater (see Figure 17).
- Standard foundation air-ventilation devices that have detachable solid covers intended to be manually installed over the vent because they do not allow for the automatic entry and exit of floodwater when the cover is in place.
- Standard foundation air-ventilation devices that are designed to open and close based on temperature unless they are also designed to allow for the automatic entry and exit of floodwater.
- Devices with covers or panels that are intended to displace when floodwaters rise on only one side of a wall because they do not satisfy the requirement for automatic entry and exit of floodwater in both directions.
- Windows below the BFE because the automatic entry and exit of floodwater cannot be satisfied by the expectation that windows will break under rising floodwater.
- Garage doors without openings because human intervention is required to open garage doors when flooding is expected. Gaps between the garage door and the door jamb or walls do not count toward the net open area requirement.

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

9.2 Non-Engineered Flood Openings

Flood openings without moving parts are non-engineered openings, while those with moving parts should be certified as engineered openings (see Section 9.3). Non-engineered openings are used to provide 1 square inch of net open area for each square foot of enclosed area. The size of an enclosed

area in square feet should be measured on the exterior of the enclosure walls. A variety of non-engineered opening options are available.

"Net open area" refers to the permanently open area of a non-engineered opening. The NFIP regulations indicate that flood openings may be equipped with "coverings or devices" if they permit the automatic (free) entry and exit of floodwater in both directions.

The measurement of the net open area must take into consideration any solid obstructions such as grilles, fixed blades and louvers, or faceplates. Methods used by the ventilation industry to account for such obstructions when determining net open area for air flow may be used. Figure 18 shows a typical standard air-vent faceplate and measurements of the net open area. Figure 19 shows a typical ventilation louver with fixed blades and indicates how the net open area is determined.

Some manufacturers of standard air vents stamp the number of square inches the device provides for air flow into the frame of the device or may note the number in the packaging. The measurement accounts for

MEASUREMENT MUST ACCOUNT FOR OBSTRUCTIONS

Section C2.7.2.1 of the ASCE 24 commentary emphasizes that the measurement of net open area is not based on the dimensions of the opening (void) in the wall. The measurement must account for any portion of the void that is obstructed or covered in any way (other than by screening).

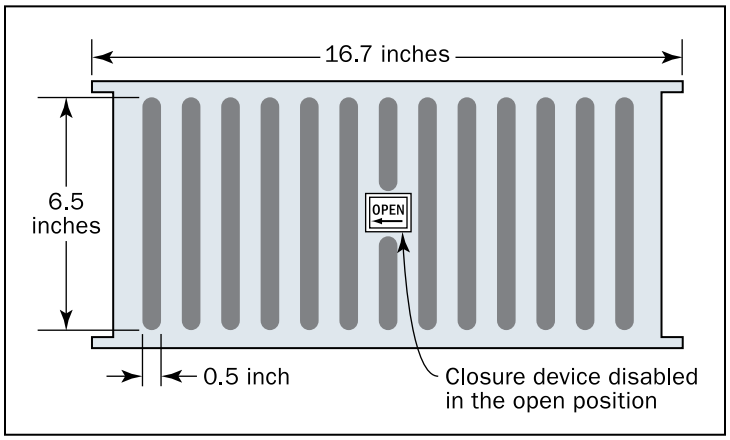


Figure 18: Example of non-engineered opening: Typical standard air vent faceplate providing 42 square inches of net open area if disabled in the open position; measurement of net open area uses a slot width of 0.5 inch times a slot height of 6.5 inch times the total number of slots

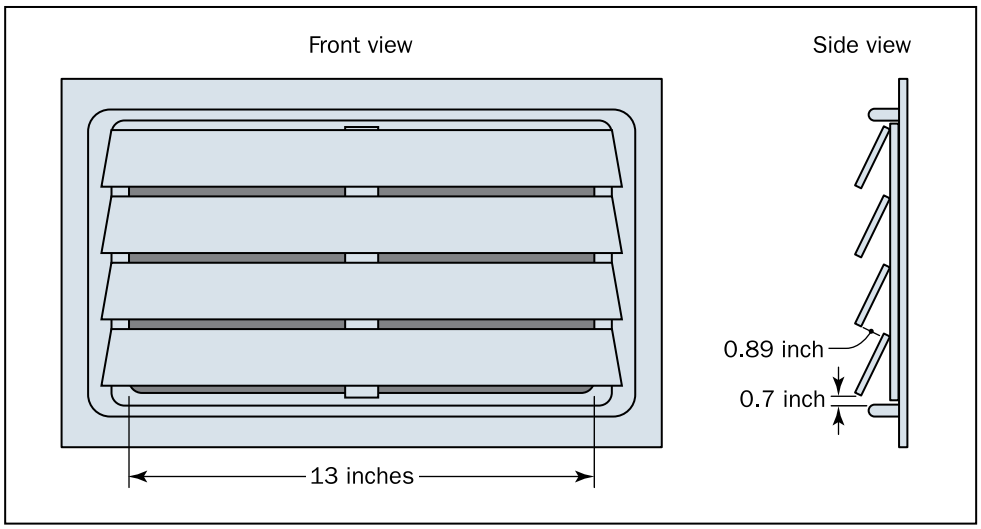


Figure 19: Example of non-engineered opening: Typical standard air vent with fixed, angled blades providing approximately 44 square inches of net open area; measurement of net open area uses slot width of 13 inches times the sum of the spaces between the blades

the presence of fixed blades, insect screens, and other obstructions. The same number of square inches should be used for the net open area calculation when these devices are installed as non-engineered openings. If not indicated by the manufacturer, the net open area must be measured. Guidance on measuring the net opening area may be available from manufacturers or other sources.

To qualify as non-engineered flood openings that permit the automatic entry and exit of floodwater:

- Standard air vents must not have solid covers (detachable or integrated with the vent) that are intended to be manually installed.
- Typical air-vent devices that are designed to be opened and closed manually must be disabled permanently in the open position.
- Air-vent devices that are designed to open and close based on temperature must also be designed to allow the automatic entry and exit of floodwater.

Insect screens that do not block the entry and exit of floodwater are allowed and do not affect the determination of the net open area. Communities that administer the IBC or IRC should note the requirement to cover ventilation openings for crawlspaces and under-floor spaces. The codes provide a list of acceptable covering materials.

The IBC and IRC commentaries note that some covering materials for ventilation openings may reduce the gross open area of the vent by as much as 50 percent. Although the net open area is not reduced by screens, in areas where floodwater is expected to carry debris such as grass clippings and leaves, insect screens tend to clog (see Figure 20). Engineers, architects, and local officials may determine that a different type of opening is appropriate or that more than the minimum number of flood openings is required to increase the likelihood that openings will perform as expected during flooding, even if some of them become clogged with debris.

AREAS LIKELY TO HAVE DEBRIS AND SEDIMENT

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

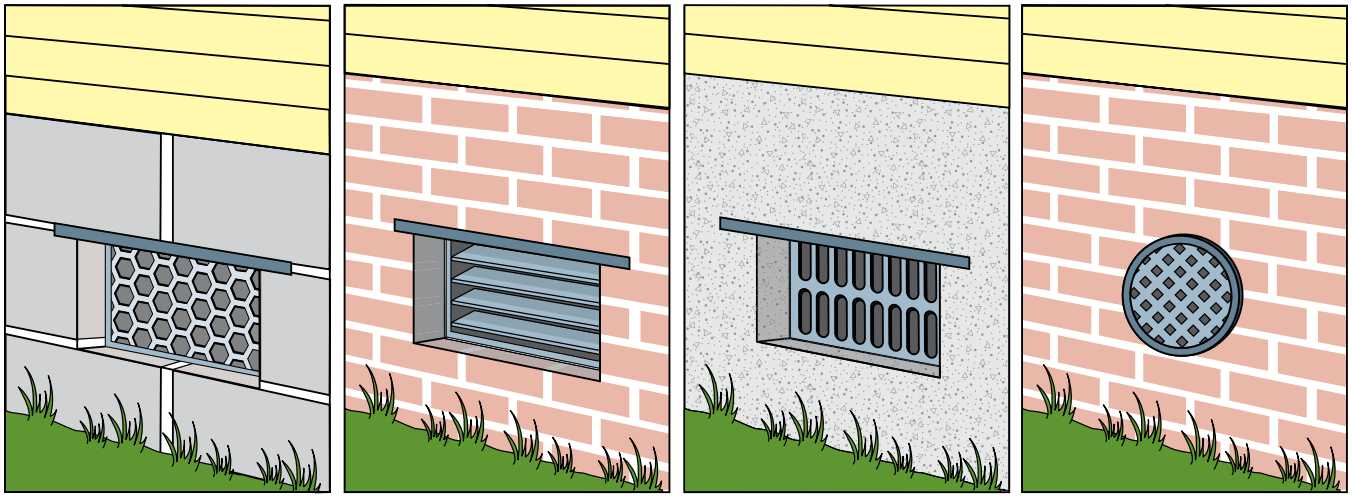
Figure 20: Typical air vents with insect screens blocked by flood debris

Examples of non-engineered openings are described below and shown in Figures 21 through 24.

- Figure 21 shows typical standard air-ventilation devices that are intended for crawlspace foundation walls. If installed as flood openings, they must be disabled permanently in the open position to satisfy the requirement for automatic entry and exit of floodwater.
- Figure 22 shows decorative masonry units and decorative brickwork with closely spaced, open holes. Only the net open area of each hole is counted.
- Figure 23 shows standard concrete blocks that are turned sideways and have insect screening. The voids in the blocks are measured to determine the net open area.
- Figure 24 shows a foundation in which a hole was created when the concrete was poured. The horizontal dimension should be greater than the vertical dimension to facilitate flow-through. A wood frame covered with insect screening is inserted into the hole. The framed void is measured to determine the net open area. A similar situation results when a block is omitted from perimeter foundation walls constructed of concrete masonry units, resulting in a void the size of the omitted block.

MINIMUM DIMENSION SPECIFIED BY I-CODES

The IRC and IBC (by reference to ASCE 24) require that openings be not less than 3 inches in any direction in the plane of the wall. This requirement applies to the opening in the wall, excluding any device that may be inserted.



Grate | Fixed blades | Faceplate or grille | Decorative faceplate

Figure 21: Examples of typical air vents in crawlspace foundation walls used as flood openings with varying net open areas

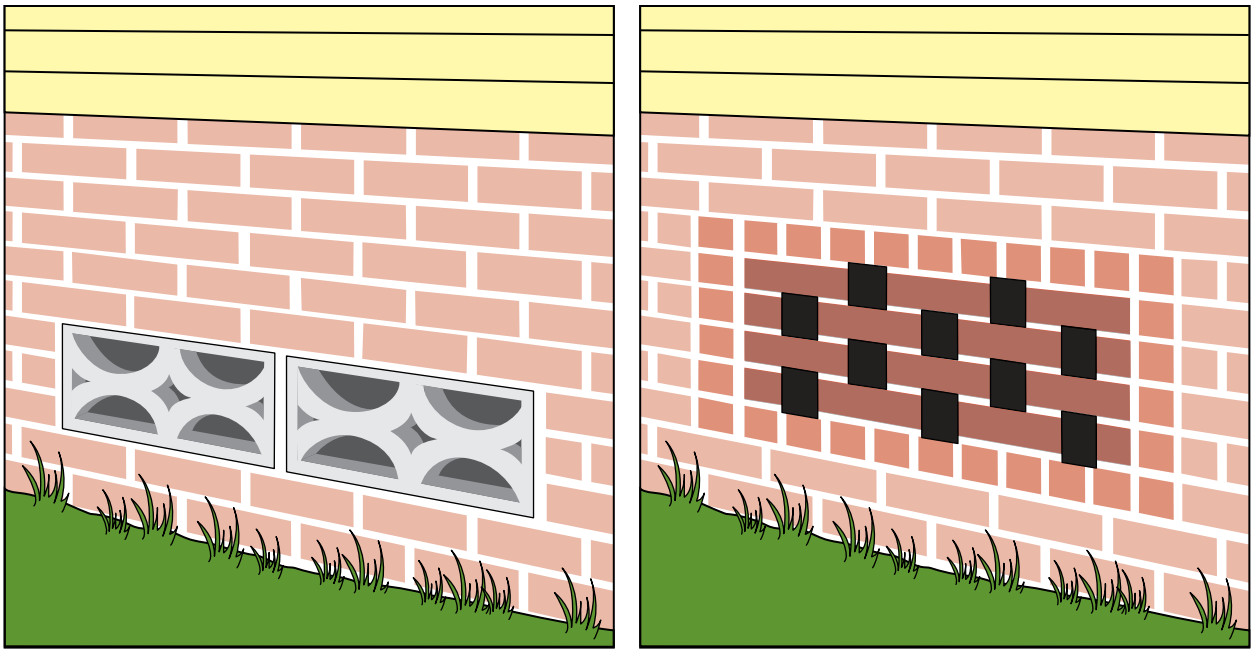


Figure 22: Decorative masonry units and closely spaced holes in brickwork; the area of each hole counts toward the total net open area

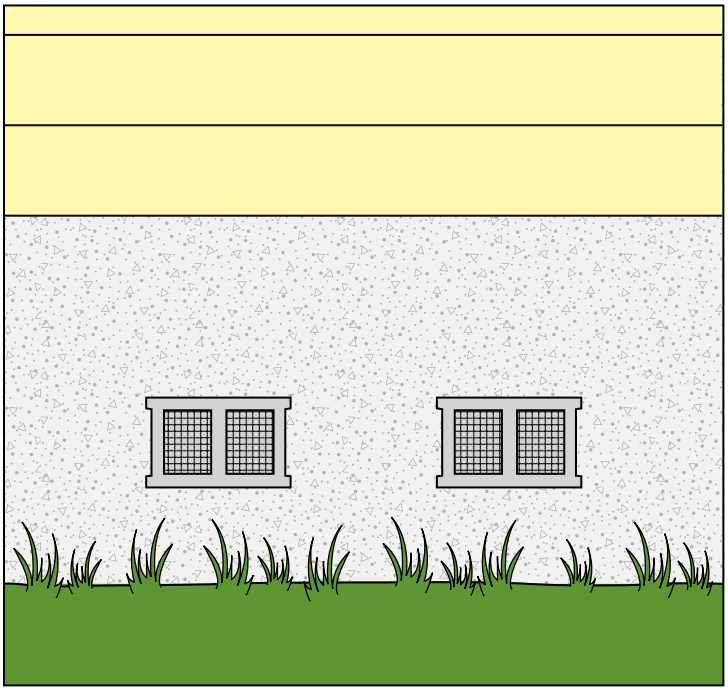


Figure 23: Concrete blocks turned sideways with insect screening; a typical 8- by 16-inch block provides approximately 60 square inches of net open area

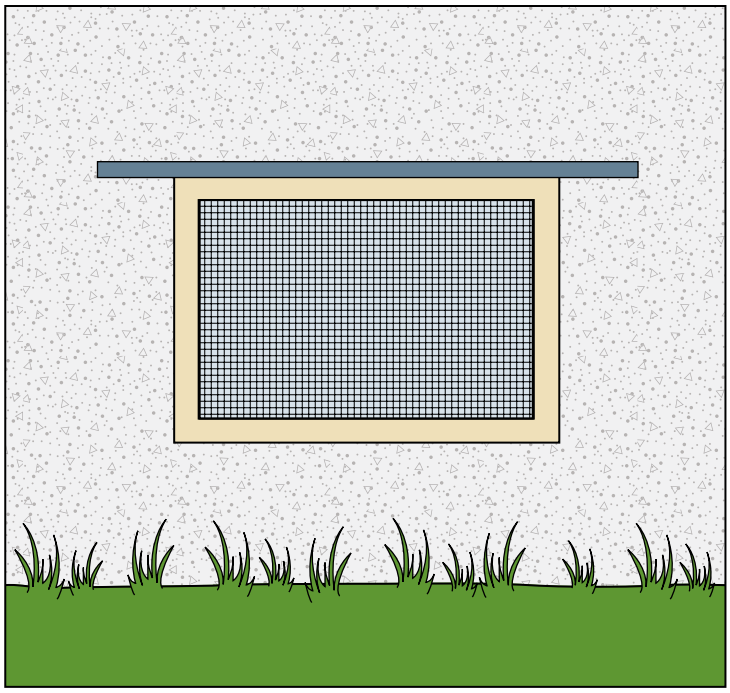


Figure 24: Wood frame with insect screen inserted in void in poured concrete foundation wall; inside dimensions of frame determine net open area

9.3 Engineered Flood Openings

Engineered flood openings, which have moving parts, must be designed and certified by registered design professionals as engineered flood openings (see Section 9.2 for openings without moving parts). The certification must specifically address the performance required by the NFIP regulations. Devices with moving parts should be certified as engineered openings. In general, engineered openings remain closed until flood conditions trigger the movable parts to allow floodwater and debris to freely and automatically enter or exit. This section describes the design and performance requirements and the certification and documentation requirements for engineered openings.

9.3.1 Design and Performance Requirements

The design and performance criteria for engineered openings are in ASCE 24, Section 2.7.2.2. Section C2.7.2.2 of the ASCE 24 commentary provides additional information on engineered openings and the best means to test expected performance.

The equation from ASCE 24, shown in Figure 25, is used to determine the total net area of engineered openings required for a given total enclosed area, based on some of the characteristics of the openings. The calculated minimum net area of engineered openings may be called the "coverage" or "rated" area.

$$A_0 = 0.033\,[1/c]\,R\,A_e$$

Where:
- A_0 = total net area of openings required (in^2)
- 0.033 = coefficient corresponding to a factor of safety of 5.0 ($in^2 \cdot hr/ft^3$)
- c = opening coefficient (non-dimensional; see ASCE 24, Table 2-2)
- R = worst case rate of rise and fall (ft/hr)
- A_e = total enclosed area (ft^2)

Figure 25: Equation used to determined total net area of engineered openings (ASCE 24-14; used with permission)

The equation includes a coefficient (0.033) that corresponds to a factor of safety of 5, which is consistent with design practices related to the protection of life and property. The ASCE 24 commentary provides additional background on the derivation of the equation.

Design and performance criteria for engineered openings specified in ASCE 24 include all of the following:

- Performance must allow for the automatic entry and exit of floodwater. The ASCE 24 commentary notes that the certification requires consideration of a number of factors that represent expected base flood conditions and not simply application of the equation. (Flood conditions in different areas can vary widely; in some areas, the onset of flooding may be rapid while in other areas, flood conditions may develop over much longer periods.)
- Performance must account for the presence of obstructions such as louvers, blades, screens, grilles, faceplates, and devices that are part of the engineered opening assembly itself. In accordance with ASCE 24, Table 2-2 (see Table 3 of this Technical Bulletin), the opening coefficient of discharge *(c)* is 0.20 for openings of all shapes if partially obstructed during design flood conditions by "louvers, blades, screens, grilles, faceplates, or other covers or devices [that] are present during the design flood," as opposed to blocked by debris.

ASCE 24 EMPHASIS ON PERFORMANCE AND CERTIFICATION

Engineered opening requirements changed between the 2005 and 2014 editions of ASCE 24. The 2014 edition places more emphasis on evidence of performance and consideration of factors that represent expected flood conditions. Section C2.7.2.2 of the ASCE 24-14 commentary notes that the best means to certify performance is to test engineered openings under conditions that mimic a range of rates of rise and fall, including rates many times the minimum rate of 5 feet per hour.

Documentation of performance under faster rates of rise and fall provides building designers and local officials with sufficient information on which to base decisions regarding whether to increase the number or size of openings to account for faster rates. The ASCE 24 commentary also notes that testing should be done with water containing debris typical of flooding around buildings (e.g., leaves, grass clippings, small branches, trash).

(The coefficient of discharge, also called an orifice coefficient, is selected to characterize the shape of the portion of an engineered opening through which water flows.)

Table 3: Flood Opening Coefficient of Discharge[1]

Opening Shape and Condition	*C*
All shapes, partially obstructed during design flood[2]	0.20
Circular, unobstructed during design flood	0.60
Rectangular, long axis horizontal, short axis vertical, unobstructed during design flood	0.40[3]
Square, unobstructed during design flood	0.35
Rectangular, short axis horizontal, long axis vertical, unobstructed during design flood	0.25[4]
Other shapes, unobstructed during design flood	0.30

Source: ASCE 24-14, Table 2-2 (used with permission)

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

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

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

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

- Performance must account for the potential for debris blockage even if there are no louvers, blades, screens, grilles, faceplates, or other devices, preferably by allowing typical floodborne debris to pass through.
- Performance must ensure that the difference between the exterior and interior water levels will not exceed 1 foot. (Because the minimum requirement allows the bottom of openings to be no more than 1 foot above the higher of the finished interior grade [or floor] or exterior grade, a difference of no more than 1 foot is maintained when water begins to pass through as it crests the bottom of the opening frame.)
- The minimum dimension of an opening in a wall must not be less than 3 inches in any direction in the plane of the wall.

FLOODWATER RATE OF RISE AND FALL

Section C2.7.2.2 of the ASCE 24 commentary notes that a rate of rise of 5 feet per hour, only 1 inch per minute, is not representative of many flood hazard areas and advises building designers to be cautious about relying entirely on that rate. Faster rates of rise and fall are likely in watersheds where rainfall runoff accumulates rapidly and in many areas that are subject to storm surge flooding. ASCE 24 advises that information on rates of rise may be available from stream and tide gauges; federal, state, and local sources; and video documentation of past flood events.

- Reliable data on the rates of rise and fall at specific locations are usually not readily available. Therefore, engineered openings must be designed and must function based on the assumption that the minimum rate of rise and fall will be 5 feet per hour. Reinforcing the importance of testing for

faster rates of rise and fall, building designers must increase the specified total net area of engineered openings when site-specific data or analyses of anticipated flood conditions indicate that more rapid rates of rise and fall are likely.

9.3.2 Documentation of Engineered Openings for Compliance

Engineered openings should be accepted by local officials when the designs are certified and the certifications are submitted as part of permit applications. Acceptable documentation of certification are the certification reports (i.e., ICC-ES Evaluation Reports or equivalent reports from other product certification organizations) and individual certifications for specific buildings (see Section 9.3.4).

Copies of the certifications must be kept in the community's permanent permit files. Community retention of these documents is important not only to demonstrate compliance but also in the event that future building owners do not receive copies of the certifications when they buy buildings. Owners must submit certifications with applications for NFIP flood insurance policies.

I-CODES REQUIRE DESIGN STATEMENTS

The IBC and IRC require that construction documents submitted for building permits include design statements by registered design professionals when applicants propose using engineered openings. ICC-ES Evaluation Reports and equivalent certification reports satisfy this requirement.

Individual certifications prepared for specific buildings also satisfy the requirement for design statements.

9.3.3 Engineered Openings with Certification Reports

The ICC-ES and other product certification organizations develop criteria for acceptance of a variety of building products, construction methods, and materials. Each organization issues certification reports after technical evaluation of documentation that is submitted by manufacturers. Documentation typically includes technical design reports, certifications, and testing results to demonstrate performance and compliance with codes and standards. Certification reports provide evidence that products comply with specific building codes and standards. Designers, builders, and local officials who rely on these reports must determine whether the reports identify the editions of the building codes and ASCE 24 that are applicable to individual projects. If applicable editions of the codes and standard are not identified, the certification report should not be used.

Documentation submitted by manufacturers to obtain an ICC-ES Evaluation Report or equivalent certification report for engineered openings must be supported by certifications describing the performance of the openings and the name, title, address, type of license, license number, the state in which the license was issued, and the signature and seal of the certifying registered

SITE-SPECIFIC APPLICABILITY OF ENGINEERED OPENINGS

When an engineered opening product with a certification report issued by ICC-ES or an equivalent product certification organization is specified in construction documents, the engineer, architect, or builder should determine whether the product, given its limitations and conditions of use, is appropriate for the conditions of flooding at the site, especially the rate of rise and fall of floodwater. Designers should consult with local officials regarding observations of past rates of rise and fall during conditions of flooding.

design professional. The certification reports must include a description of installation requirements or limitations that, if not followed, would void the certification. FEMA considers the following documentation important:

- Statement certifying that the openings, when properly installed, are designed to automatically equalize hydrostatic flood loads on exterior walls by allowing the automatic entry and exit of floodwater in accordance with the design and performance requirements in ASCE 24.
- Statement certifying that the performance accounts for the presence of louvers, blades, screens, grilles, faceplates, or devices with consideration of the potential for debris blockage when these features are present.
- Description of the measurement of the actual net area of the engineered opening that is being certified and identification of the opening coefficient of discharge, which is the variable c in the formula in ASCE 24 (see Figure 25 and Table 3 of this Technical Bulletin). The coefficient of discharge is selected by the designer based on the shape and dimensions of the opening and whether the engineered opening has features such as louvers, blades, screens, grilles, faceplates, or devices that partially obstruct flow during conditions of flooding.
- The range of flood characteristics tested for which the certification is valid, specifically the rates of rise and fall of floodwater, which is the variable R in the formula in ASCE 24 (see Figure 25), and whether there are any limitations based on rates of rise and fall that are faster than 5 feet per hour. Given the ASCE 24 performance expectations, engineered openings must function during conditions of the minimum 5 feet per hour rate of rise and fall.

9.3.4 Engineered Openings Individually Certified for Specific Buildings

Engineered openings that do not have ICC-ES Evaluation Reports or equivalent certification reports must be individually certified as meeting the design requirements described in Section 9.3.1 of this Technical Bulletin and for acceptability in specific buildings based on site-specific conditions. The formula in Section 9.3.1 includes the variable R, which is the worst-case rate of rise and fall at a specific location. ASCE 24 allows the assumption of a minimum rate of rise and fall of 5 feet per hour only in the absence of reliable data on site-specific rates of rise and fall. Building designers who specify engineered openings that are individually certified should consult local officials regarding observations of past rates of rise and fall during conditions of flooding.

Generic certifications for manufactured products place the burden on users (who may not be design professionals) to determine whether a specific location is subject to rates of rise and fall greater than 5 feet per hour. For this reason, generic "fill-in-the-blank" certifications are not acceptable when a manufactured product is used for a specific building unless the builder or design professional for that building, or the local official, determines that the rates of rise and fall at the specific location are no faster than 5 feet per hour. Alternatively, the builder or design professional may submit documentation that there are no reliable data for site-specific rates of

INDIVIDUAL CERTIFICATION FOR SPECIFIC BUILDINGS MUST ADDRESS SEVERAL FACTORS

Section C2.7.2.2 of the ASCE 24 commentary indicates that "certification requires more than simply applying the equation … it requires consideration of a number of factors that represent expected base flood conditions." The commentary also notes that engineered openings should be tested unless uniquely designed for a specific location.

rise and fall, in which case the local official may concur that the rates may be assumed to be no faster than 5 feet per hour.

When engineered openings that have been individually certified for specific buildings are used, the permit application must include a certification that is signed and sealed by the registered design professional, who must be licensed to practice in the state in which the building is located. In addition, the submitted plans must identify the location for the openings and specify installation instructions.

The original certification for engineered openings prepared for specific buildings must include the design professional's name, title, address, signature, type of license, license number, the state in which the license was issued, and the signature and applied seal of the certifying registered design professional. The original certification must identify the physical location of the building in which the engineered openings will be installed.

This Technical Bulletin relies on the ASCE 24 requirements for engineered openings as the accepted standard of practice. The certification must include a description of installation requirements or limitations that, if not followed, will void the certification. In addition to the design and certification criteria listed in Section 9.3.1, the certification must include the following:

- Statement certifying that the openings, when properly installed, are designed to automatically equalize hydrostatic flood loads on exterior walls by allowing the automatic entry and exit of floodwater in accordance with the design and performance requirements in ASCE 24.
- Statement certifying that the performance accounts for the presence of louvers, blades, screens, grilles, faceplates, or devices with consideration of the potential for debris blockage when these features are present.
- Description of the measurement of the actual net area of the engineered opening and identification of the opening coefficient of discharge, which is the variable c in the formula in ASCE 24 (see Figure 25 and Table 3 of this Technical Bulletin). The coefficient of discharge is selected by the designer based on the shape and dimensions of the opening and whether the engineered opening has features such as louvers, blades, covers, screens, grilles, faceplates, or other elements that partially obstruct flow during conditions of flooding.
- Determination of the rate of rise and fall of floodwater at the site and a statement certifying that the openings are designed for that rate of rise and fall or a statement that the opening is designed for a minimum rate of rise and fall of 5 feet per hour because reliable data on site-specific rates of rise and fall are not available.

9.3.5 NFIP Elevation Certificate and Documentation of Engineered Openings for Flood Insurance

When engineered openings are used, the NFIP Elevation Certificate must be completed carefully. The question "Engineered flood openings?" must be answered with "Yes" (see A8.d and A9.d in Figure 26). The engineered opening documentation must be attached to the NFIP Elevation Certificate. Insurers and insurance agents must ask property owners to provide the documentation as part of applications for NFIP flood insurance policies. The following are acceptable forms of documentation:

- For engineered openings with ICC-ES Evaluation Reports or equivalent reports from other product certification organizations, a copy of the report that identifies the manufacturer's model number and specifies the number of such openings that are required for a specified square footage of enclosed area
- For engineered openings individually certified for installation in a specific building, a certification that is signed and sealed by a registered design professional who is licensed in the state where the building is located, and that addresses the statements described in Section 9.3.4

NFIP ELEVATION CERTIFICATES AND NON-ENGINEERED OPENINGS

When non-engineered openings are used, the total net open area of the openings that are within 1.0 foot above the higher of the exterior or interior grade or floor should be determined by measurement (see examples in Section 9.2) or by using the manufacturer's specifications.

To complete the NFIP Elevation Certificate with information required for proper rating of NFIP flood insurance policies for buildings with engineered openings, Item A8.c, "Total net area of flood openings in A8.b," must be filled in with the total coverage or rated area of engineered openings. The total coverage or rated area is the number of engineered openings identified in Item A8.b multiplied by the "coverage" area, "rated" area, or "enclosed area coverage" identified in the ICC-ES Evaluation Report, equivalent report, or individual certifications. When engineered openings are used in attached garages, Item A9.c must be completed in the same manner. The coverage or rated area usually is given in square feet of enclosed area for which an engineered opening can provide automatic inflow and outflow of floodwater, which is, in effect, equivalent to the performance that would be provided by that number of square inches of non-engineered openings.

Also, in Section D, "Check here if attachments" must be selected, and a copy of the certification report must be attached to the NFIP Elevation Certificate (see Figure 26). Notes must be added in the Section D comment section to identify the manufacturer and the manufacturer's model number of the engineered opening.

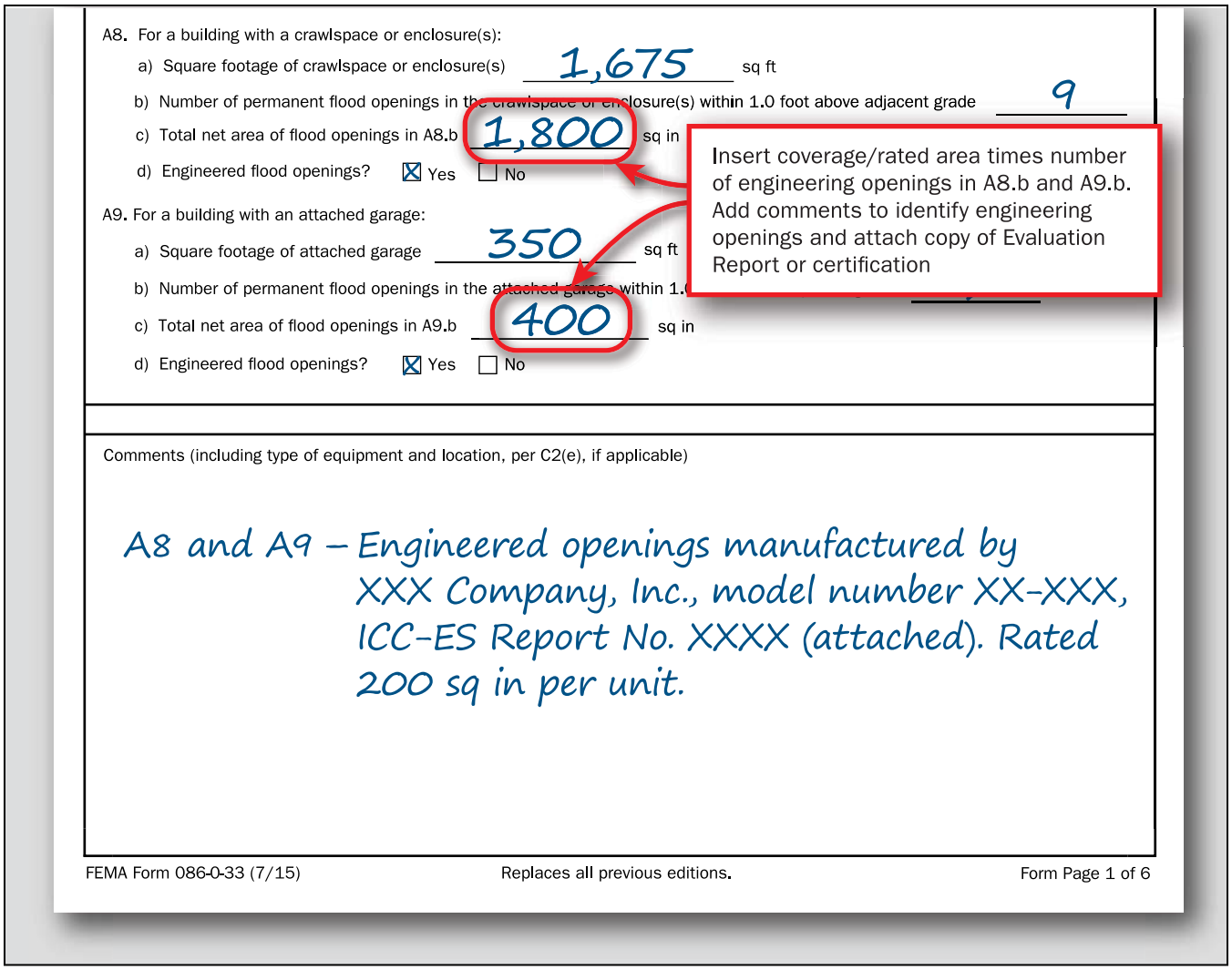


Figure 26: Completing the NFIP Elevation Certificate when engineered openings are used

10 References

This section lists the references cited in this Technical Bulletin. Additional resources related to NFIP requirements are provided in Technical Bulletin 0.

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- Technical Bulletin 0, *Users Guide to Technical Bulletins*.
- Technical Bulletin 2, *Flood Damage-Resistant Materials Requirements*.
- Technical Bulletin 3, *Non-Residential Floodproofing – Requirements and Certification*.
- Technical Bulletin 7, *Wet Floodproofing Requirements for Certain Buildings Located in Special Flood Hazard Areas*.
- Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls*.
- Technical Bulletin 11, *Crawlspace Construction for Buildings Located in Special Flood Hazard Areas: National Flood Insurance Program Interim Guidance*.

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Technical Bulletin

Crawlspace Construction

for Buildings Located in Special Flood Hazard Areas National Flood Insurance Program Interim Guidance

FEMA TB-11 / November 2001

FEMA

Key Word/Subject Index

This index allows the user to locate key words and subjects in this Technical Bulletin. The Technical Bulletin User's Guide (printed separately) provides references to key words and subjects throughout the Technical Bulletins. For definitions of selected terms, refer to the Glossary at the end of this bulletin.

Any comments on the Technical Bulletins should be directed to:

Federal Emergency Management Agency
Federal Insurance and Mitigation Administration
500 C Street, SW.
Washington, DC 20472

Wave design on cover based on the Japanese print *The Great Wave Off Kanagawa*, by Katsuchika Hokussai (1760–1849), Asiatic Museum of Fine Arts, Boston.

TECHNICAL BULLETIN 11-01

Crawlspace Construction for Buildings Located in Special Flood Hazard Areas National Flood Insurance Program Interim Guidance

Introduction

Crawlspace foundations are commonly used to elevate the lowest floors of residential buildings located in Special Flood Hazard Areas (SFHAs) above the Base Flood Elevation (BFE). This Technical Bulletin provides guidance on crawlspace construction and supports a recent policy decision to allow construction of crawlspaces with interior grades up to 2 feet below the lowest adjacent exterior grade (LAG), referred to as below-grade crawlspaces, provided that other requirements are met. Prior to that decision, below-grade crawlspaces were considered basements under the National Flood Insurance Program (NFIP) Floodplain Management Regulation definitions at 44 CFR 59.1 and were not permitted below the BFE. This requirement had been established because below-grade crawlspace foundation walls are exposed to increased forces during flood conditions, such as hydrostatic and saturated soil forces.

In many parts of the country, a common practice is to construct crawlspaces with the interior floor 1 or 2 feet below-grade by either (1) backfilling against the exterior of the foundation wall or (2) excavating the crawlspace area to construct footings that result in a below-grade crawlspace floor. Because FEMA wishes to recognize common construction practices that do not increase flood damage, FEMA recently completed a review of the policy for residential crawlspace construction. In this review, the construction practices for below-grade crawlspaces were examined to determine whether a crawlspace that was 1 or 2 feet below grade would increase the flood damage potential to the foundation walls or result in additional damages to the building.

The review included (1) an engineering analysis that assessed the damage potential of floodwaters acting upon below-grade crawlspace foundation walls, (2) a review of available NFIP claims history for crawlspaces, and (3) input from FEMA Regional staff and NFIP General Adjusters of any firsthand knowledge of crawlspace damage during flood events. A review of NFIP claims history and staff input did not reveal evidence of structural damage or failure of crawlspace foundation walls during flood events. The engineering analysis indicates that below-grade foundation walls, when constructed according to common practice, have sufficient capacity to resist flood-related forces from standing and low-velocity floodwaters, subject to the requirements outlined in this bulletin.

This Technical Bulletin presents NFIP minimum requirements for crawlspace construction in the SFHA, including (1) requirements for all crawlspace construction and (2) requirements for below-grade crawlspace construction that may extend 1 or 2 feet below grade in the SFHA. This Technical Bulletin also provides a best practices approach for preferred and below-grade crawlspace construction, illustrated in Figures 1 and 2, including design limitations, water accumulation and drainage considerations, and use of flood-resistant materials. While communities may now allow below-grade crawlspace construction in the SFHA, this type of construction is not the recommended construction method, because of the increased likelihood of problems with water accumulation,

moisture damage, and drainage. The use of crawlspace construction with the interior grade at or above the LAG minimizes the occurrence of these problems. This interim guidance on residential crawlspace construction is based on conclusions from the recently completed review and analyses.

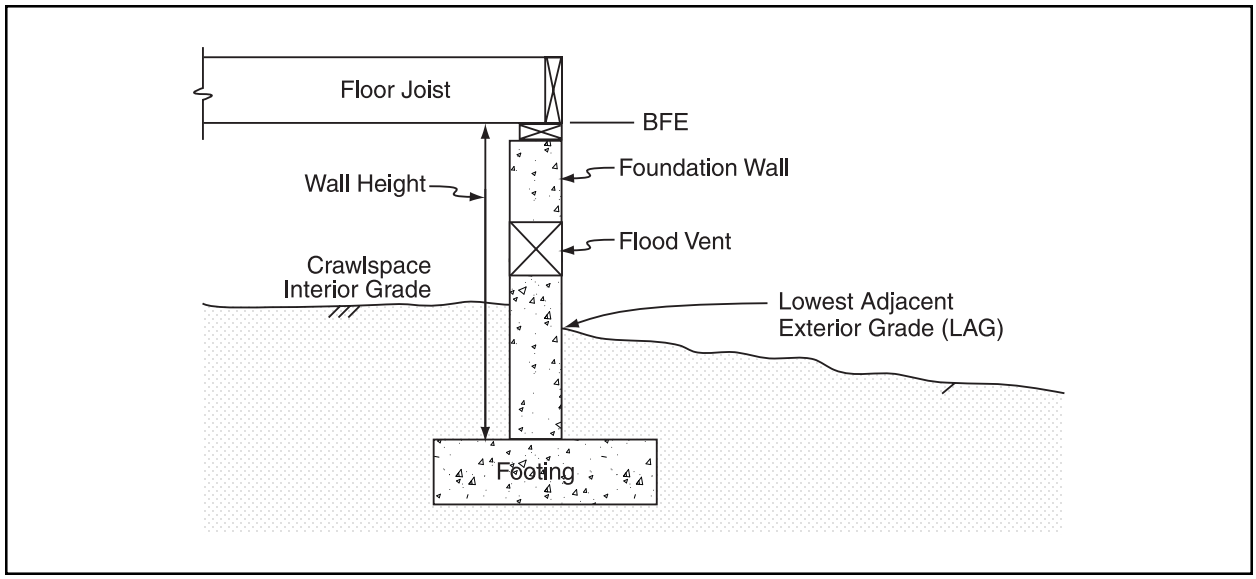

Figure 1 Preferred crawlspace construction.

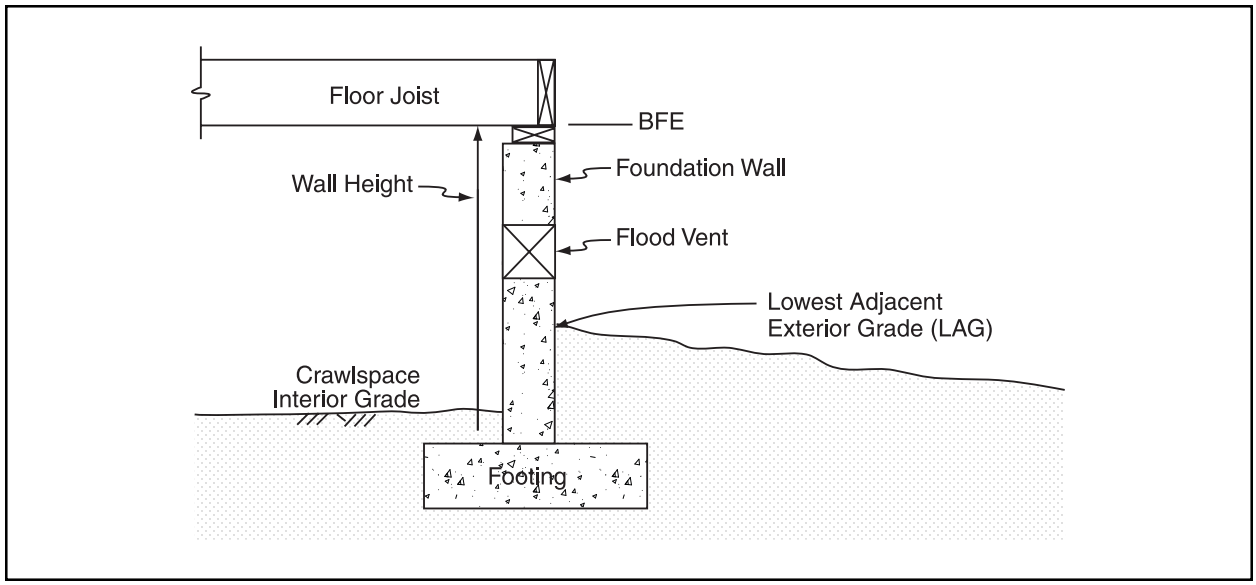

Figure 2 Below-grade crawlspace construction.

This Technical Bulletin provides **interim** guidance. The decision whether or not to allow below-grade crawlspace construction will be left to each community. Communities should review applicable state laws, regulations, and building codes, and consult with their State NFIP Coordinator to determine whether below-grade crawlspace construction is permitted in their state. Communities that choose to allow below-grade crawlspace construction will be required to amend their floodplain management ordinance to include the provisions outlined in the following sections on below-grade crawlspace construction. Please note that communities that choose to amend their ordinance to allow for below-grade crawlspaces in response to this interim guidance may also be required at some later date to amend their ordinance if FEMA adopts revised regulations that differ from the interim guidance.

Note

Any building utility systems within the crawlspace must be elevated above the BFE or designed so that floodwaters cannot enter or accumulate within system components during flood conditions. Ductwork, in particular, must either be placed above the BFE or sealed to prevent the entry of floodwaters. FEMA 348, *Protecting Building Utilities from Flood Damage*, provides detailed guidance on designing and constructing flood-resistant utility systems.

NFIP Requirements

NFIP requirements that apply to crawlspace construction are found in sections 44 CFR 60.3(a)(3) and 60.3(c)(2) and (c)(5) of the NFIP regulations. NFIP requirements that apply to all crawlspaces are discussed in the first section below. The second section lists additional requirements that must be applied to crawlspaces that have interior grades below the LAG. The additional requirements are intended to ensure that these crawlspaces are not subject to flood-related loads that would exceed the strength of the crawlspace wall and lead to failure and significant damage to the building or to other damage related to poor drainage in the below-grade crawlspace.

NFIP Requirements for All Crawlspace Construction

Crawlspaces are commonly used as a method of elevating buildings in SFHAs to or above the BFE. General NFIP requirements that apply to all crawlspaces that have enclosed areas or floors below the BFE include the following:

- The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can usually be addressed though the required openings discussed in the next bullet. Because of hydrodynamic loads, crawlspace construction is not recommended in areas with flood velocities greater than 5 feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer. Other types of foundations are recommended for these areas.
- The crawlspace is an enclosed area below the BFE and, as such, must have openings that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. The bottom of each flood vent opening can be no more than 1 foot above the lowest adjacent exterior grade. For guidance on flood openings, see Technical Bulletin 1-93, *Openings in Foundation Walls*.

- Crawlspace construction is not permitted in V zones. Open pile or column foundations that withstand storm surge and wave forces are required in V zones.
- Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE. The recommended construction practice is to elevate the bottom of joists and all insulation above BFE. Insulation is not a flood-resistant material. When insulation becomes saturated with floodwater, the additional weight often pulls it away from the joists and flooring. Ductwork or other utility systems located below the insulation may also pull away from their supports. See the section Flood-Resistant Materials, on page 8 this bulletin. For more detailed guidance on flood-resistant materials see Technical Bulletin 2-93, *Flood-Resistant Materials Requirements*.
- Any building utility systems within the crawlspace must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters. For further guidance on the placement of building utility systems in crawlspaces, see FEMA 348, *Protecting Building Utilities From Flood Damage.*

Flood-resistant materials and utilities, access, and ventilation openings in crawlspaces are further addressed in this bulletin.

Additional Requirements for Below-Grade Crawlspaces

If a community chooses to amend its floodplain management ordinance to allow for the construction of below-grade crawlspaces, the ordinance must include the following provisions in addition to the above requirements:

- The interior grade of a crawlspace below the BFE must not be more than 2 feet below the lowest adjacent exterior grade (LAG), shown as D in Figure 3.
- The height of the below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall must not exceed 4 feet (shown as L in Figure 3) at any point. The height limitation is the maximum allowable unsupported wall height according to the engineering analyses and building code requirements for flood hazard areas (see the section Guidance for Pre-Engineered Crawlspaces, on page 7 of this bulletin). This limitation will also prevent these crawlspaces from being converted into habitable spaces.
- There must be an adequate drainage system that removes floodwaters from the interior area of the crawlspace. The enclosed area should be drained within a reasonable time after a flood event. The type of drainage system will vary because of the site gradient and other drainage characteristics, such as soil types. Possible options include natural drainage through porous, well-drained soils and drainage systems such as perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity or mechanical means.
- The velocity of floodwaters at the site should not exceed 5 feet per second for any crawlspace. For velocities in excess of 5 feet per second, other foundation types should be used.

- Below-grade crawlspace construction in accordance with the requirements listed above will not be considered basements.

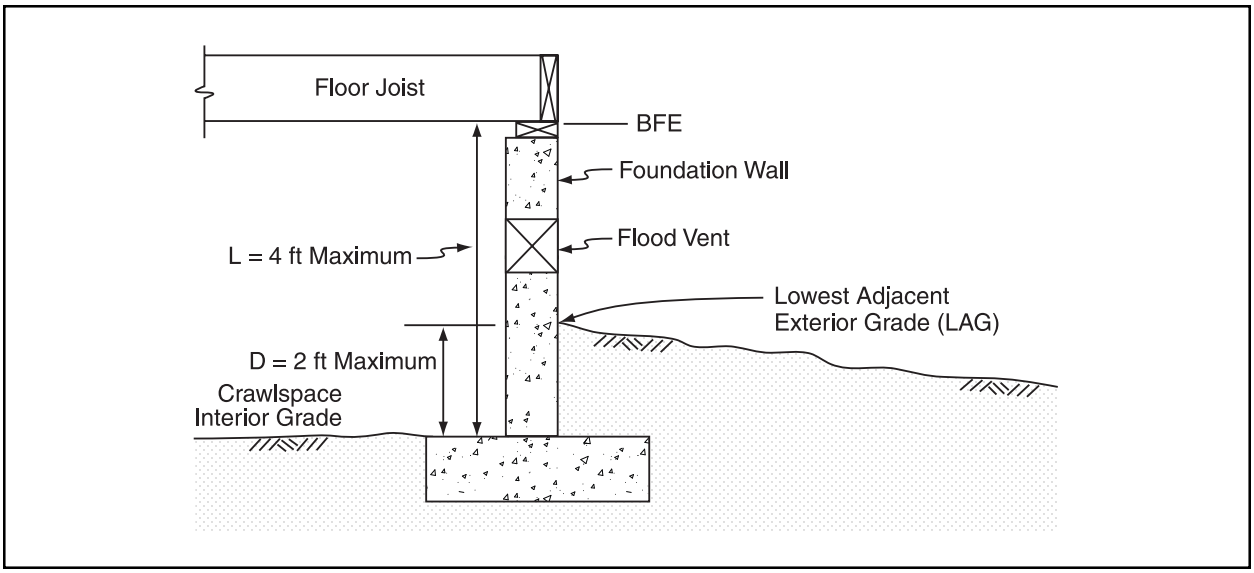

Figure 3 Requirements regarding below-grade crawlspace construction.

Drainage considerations for below-grade crawlspaces are further addressed in this bulletin. For additional information regarding this interim guidance, please contact the FEMA Regional Office or State NFIP Coordinator. Local FEMA regional offices are listed in the separately printed *User's Guide to Technical Bulletins* and may be found at the www.fema.gov website.

Flood Forces on Buildings

Buildings in flood hazard areas may be subjected to a variety of flood-induced forces. During inundation by standing or low-velocity floodwaters, a building must primarily resist hydrostatic pressures from saturated soils and floodwaters. This situation is typical of broad, flat floodplains and floodways along lower-gradient rivers and streams. During inundation by high-velocity floodwaters, a building must also resist hydrodynamic forces and impact loads. High-velocity floodwaters are found in floodways along steeper-gradient rivers, sheet flow down slopes, or coastal areas with storm surge and waves.

The community Flood Insurance Study contains a Floodway Data Table that includes data on mean velocities (in feet per second) within the floodway at each cross section along the river or stream. The mean averages the higher channel velocities with lower velocities in overbank areas that are within the floodway. Generally, velocities at sites outside of the floodway are lower than the mean floodway velocities listed in the Floodway Data Table. For example, if the mean floodway velocity at a cross section is 4 feet per second, the velocities outside the floodway are likely less than that value. If in doubt about the floodway velocity or in areas where the mean floodway velocity may exceed 5 feet per second, contact an engineer knowledgeable in hydraulics and hydrology to determine flood velocities at the building site.

Buildings located in areas subject to ponding or low-velocity flows must primarily address issues related to hydrostatic loads on the crawlspace foundation, removal of floodwater and sediment from the crawlspace area, and other NFIP floodproofing requirements, such as protecting or elevating utilities and using flood-resistant materials.

Crawlspace construction is not recommended in A zones with high-velocity floodwaters (greater than 5 feet per second). Other types of foundations, such as open pile or column foundations, that allow floodwaters to flow freely beneath the building are recommended for these areas.

Flood Insurance Implications

In May 1999, the Federal Insurance Administration (now the Federal Insurance and Mitigation Administration – FIMA) revised the rates being charged for residential buildings with below-grade crawlspaces. These rates were considerably lower than the full basement rates previously charged for these buildings. In May 2001, these rates were further reduced based on engineering analyses performed by FEMA. However, rates for buildings with below-grade crawlspaces will be higher than rates for buildings that have the interior grade of the crawlspace at or above the adjacent exterior grade, since the risk of flood damage is greater for the former type of construction. As more experience is gained on crawlspace losses, FEMA will continue to reassess those rates, factoring in the cost of pumping out and cleaning these areas, as well as physical damage to the foundation. Buildings with below-grade crawlspaces currently cannot be rated by an insurance agent using the NFIP *Flood Insurance Manual*. They must be submitted for a special rating under the Submit-to-Rate process by underwriters knowledgeable in this type of construction. FIMA will determine whether the rating for this type of construction should be standardized and included in the Flood Insurance Application and the *Flood Insurance Manual*.

Caution

Buildings that have below-grade crawlspaces will have higher flood insurance premiums than buildings that have the preferred crawlspace construction, with the interior elevation at or above the lowest adjacent exterior grade (LAG).

Best Practices for Crawlspace Foundations in SFHA

The NFIP preferred construction practice for excavated crawlspace construction is to backfill the interior area so that it is level with or higher than the LAG. If trench construction is used to place footings, the trenches should be backfilled to the level of the adjacent exterior grade, to avoid ponding of water. A reinforced masonry or concrete foundation wall that is anchored to the footing and lowest floor with connectors will provide the best performance in flood events. This type of construction will better resist hydrostatic pressures against the foundation and limit the amount of water that will pond under the building after a flood.

The 2000 *International Residential Code* (IRC 2000), Section 327, addresses flood-resistant design and construction of foundation walls in flood hazard areas and is consistent with NFIP requirements. The IRC requires that all structural systems in floodplains be designed, connected, and anchored to resist flotation, collapse, or permanent lateral movement due to structural loads from flooding equal to the design flood elevation. The IRC limits the unsupported height of plain (unreinforced) 8-inch hollow masonry walls to 4 feet for flood-resistant construction, where the unsupported height is the distance from the finished grade of the enclosed crawlspace area to the top of the foundation wall.

A community that chooses to allow the construction of below-grade crawlspaces should develop a multi-hazard approach that also resists other loads from hazards such as wind and earthquake. Crawlspace foundation walls must bear or resist all loads that may be experienced during their useful service life.

Guidance for Pre-Engineered Below-Grade Crawlspace Foundations

FEMA performed an engineering analysis to determine the effect of flood-related forces on crawlspace foundation walls (see Figure 4), particularly for unreinforced concrete and concrete masonry construction. The analysis followed design criteria prescribed in the American Concrete Institute (ACI) *Building Code Requirements and Commentary for Reinforced Concrete* (ACI 318-92) and the 1999 Masonry Standards Joint Committee (MSJC) *Building Code Requirements and Specifications*. Flood analysis procedures from FEMA 259, *Engineering Principles and Practices of Retrofitting Flood-Prone Residential Structures,* were used for calculating hydrostatic and hydrodynamic forces. A comprehensive analysis of two flood scenarios was conducted:

- Fully saturated soil and 1-foot-deep floodwaters, that just reach the bottom of the flood opening, but have not flooded the enclosed crawlspace area.
- A fully flooded crawlspace area with velocity floodwaters acting on the above-grade portion of the crawlspace walls.

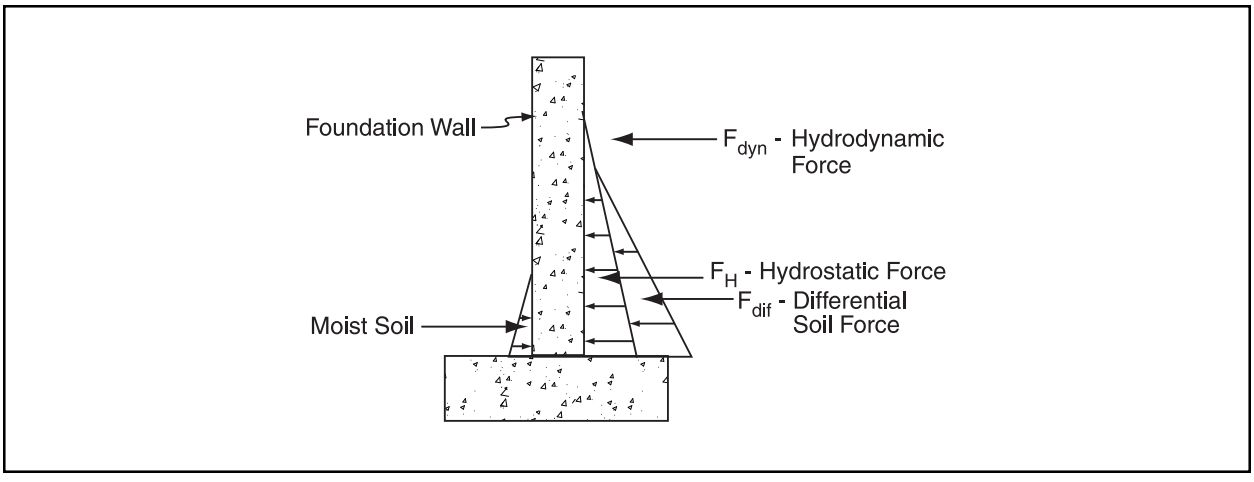

Figure 4 Flood-related forces on a crawlspace wall.

The first analysis evaluated four parameters: (1) wall construction of unreinforced 8-inch and 12-inch masonry block with standard M or S mortar type and 6-inch plain concrete foundation walls, (2) depth of interior crawlspace grade relative to the LAG, (3) flood velocity, and (4) soil types suitable for construction. The hydrostatic pressures from the saturated soil and 1-foot-deep floodwaters cause the maximum loads to occur in the lower section of the wall below the exterior grade. This analysis assumed that the 1-foot-deep floodwaters have a low velocity and are unlikely to cause significant hydrodynamic or impact loads on the foundation wall.

The second analysis evaluated hydrodynamic forces for varied flood depths and flood velocities on a foundation wall. The analysis assumed that the crawlspace was provided with proper openings to equalize hydrostatic pressure. Impact forces were not included in the analysis, as the shallow flood depths and low-velocity flows are not expected to produce significant debris impact damage. This decision was further supported by the lack of field evidence concerning wall failures from impact by debris. However, debris impact should be considered as part of the foundation wall design and analysis for riverine or other locations with high-velocity flows.

These analyses found that a crawlspace can resist flood-related forces for flood velocities up to 5 feet per second, if the wall height is limited to 4 feet and the top of the footing is no more than 2 feet below-grade.

As a result of these analyses, FEMA has determined that communities may allow below-grade residential crawlspace construction provided that the interior grade of the crawlspace does not exceed 2 feet below the LAG, and the height of the crawlspace measured from the interior grade of the crawlspace at any point to the bottom of the lowest horizontal structural member of the lowest floor does not exceed 4 feet for the specified wall construction.

Flood-Resistant Materials

All structural and non-structural building materials at or below the BFE must be flood resistant. A flood-resistant material is defined as any building material capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage. Flood-resistant materials must be used for all building elements subject to exposure to floodwaters, including floor joists, insulation, and ductwork. If flood-resistant materials are not used for building elements, those elements must be elevated above the BFE. The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than low-cost cosmetic repair (such as painting). This requirement applies regardless of the expected or historical flood duration. Technical Bulletin 2-93, *Flood Resistant Materials Requirements*, further defines NFIP criteria for flood-resistant materials and material categories.

Drainage Considerations

A significant issue associated with below-grade crawlspaces is drainage of the interior crawlspace area after normal precipitation and flood events. Moisture damage to a building can be severe when water remains standing in the crawlspace area after precipitation or a flood event. Standing water also creates significant health hazards, such as mosquito breeding grounds and growth of bacteria, mold, and fungus. If crawlspace access doors do not remain secured, standing water also presents a drowning hazard.

The interim guidance for below-grade crawlspace construction requires an adequate drainage system that allows floodwaters to drain from the interior area of the crawlspace within a reasonable time. A maximum time of 72 hours is recommended to minimize floodwater contact with crawlspace materials and related moisture damage. The interim guidance is not prescriptive as to a type of drainage system; however, it is the community's responsibility to ensure that all buildings with below-grade crawlspaces have adequate drainage systems to ensure that accumulated waters drain from the crawlspace area. Communities must include in their ordinances a provision that addresses drainage requirements.

Drainage systems for below-grade crawlspace areas will vary because of site characteristics and soil types. Possible drainage system options include perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity or mechanical means. Fill dirt placed around the outside of the foundation wall should be adequately graded to slope away from the foundation and aid natural site drainage. If lots are too small to provide adequate site drainage through grading, other methods, such as swales, may be used to provide drainage away from the structure. Foundation drainage practices required by local codes must be met in addition to drainage of the enclosed below-grade crawlspace area.

Any enclosed area below the BFE is subject to flood forces and must have exterior wall openings whose bottom edges are no more than 1-foot above the LAG, in accordance with NFIP regulations. The wall openings allow the automatic entry and exit of floodwaters and for the floodwaters to reach equal levels on both sides of the foundation wall. The only exception to this requirement is dry floodproofed non-residential buildings. Further information on NFIP requirements for flood openings in foundation walls is found in Technical Bulletin 1-93, *Openings in Foundation Walls*.

Utilities, Access, and Ventilation Openings

NFIP regulations at 44 CFR, Section 60.3(a)(3)(iv) require that "utility systems shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located to prevent water from entering or accumulating within the components during conditions of flooding." The utility systems can be either elevated above the BFE or floodproofed in a manner that prevents floodwaters from infiltrating or accumulating within any component of the system. Elevation is the recommended method of mitigation for utility systems in A Zones. FEMA 348, *Protecting Building Utilities from Flood Damage*, provides detailed guidance on designing and constructing flood-resistant utility systems.

Access and ventilation openings shall be provided to the crawlspace area according to the local building codes and regulations. Access and ventilation requirements under the IRC 2000 include the following:

- An access opening 18 inches by 24 inches shall be provided to the enclosed crawlspace area to allow access to mechanical equipment or building utilities located in this space.
- The minimum net area of required ventilation openings shall not be less than 1 square foot for each 150 square feet of enclosed crawlspace area. One such ventilation opening shall be within 3 feet of each corner of the building. Ventilation openings shall be covered with an appropriate material.

The NFIP

The NFIP was created by Congress in 1968 to provide federally backed flood insurance coverage, because flood coverage was generally unavailable from private insurance companies. The NFIP is also intended to reduce future flood losses by identifying floodprone areas and ensuring that new development in these areas is adequately protected from flood damage. The NFIP is based on an agreement between the Federal government and participating communities that have been identified as floodprone. FEMA, through the Federal Insurance and Mitigation Administration, makes flood insurance available to the residents of a participating community, provided the community adopts and enforces adequate floodplain management regulations that meet the minimum NFIP requirements. The NFIP encourages communities to adopt floodplain management ordinances that exceed the minimum NFIP criteria set forth in Part 60 of the NFIP Floodplain Management Regulations (44 CFR 60). Included in the NFIP requirements, found under Title 44 of the U.S. Code of Federal Regulations, are minimum building design and construction standards for buildings located in SFHAs. Through their floodplain management ordinances or laws, communities adopt the NFIP performance standards for new, substantially improved, and substantially damaged buildings in floodprone areas identified on FEMA's Flood Insurance Rate Maps (FIRMs).

Technical Bulletins

This publication is one of a series of Technical Bulletins that FEMA has produced to provide guidance concerning the building performance standards of the NFIP. These standards are contained in 44 CFR 60.3. The bulletins are intended for use primarily by state and local officials responsible for interpreting and enforcing NFIP regulations and by members of the development community, such as design professionals and builders. New bulletins, as well as updates of existing bulletins, are issued periodically, as necessary. The bulletins do not create regulations; rather they provide specific guidance for conforming with the minimum requirements of existing NFIP regulations. Users of the Technical Bulletins who need additional guidance concerning NFIP regulatory requirements should contact the Mitigation Division of the appropriate FEMA Regional Office or the local floodplain administrator. NFIP Technical Bulletin 0, *User's Guide to Technical Bulletins,* lists the bulletins issued to date, provides a key word/subject index for the entire series, and lists addresses and telephone numbers for FEMA's 10 Regional Offices.

Ordering Information

Copies of FEMA Technical Bulletins can be obtained from the FEMA Regional Office that serves your area. In addition, Technical Bulletins and other FEMA publications can be ordered from the FEMA Publications Distribution Facility at 1-800-480-2520. The Technical Bulletins are also available at the FEMA web site at www.fema.gov.

Further Information

The following publications contain information related to the guidance presented in this bulletin:

American Concrete Institute. 1992. ACI318-92. *Building Code Requirements and Commentary for Reinforced Concrete*. Detroit, MI.

American Society of Civil Engineers. 1998. SEI/ASCE 7-98. *Minimum Design Loads for Buildings and Other Structures*. Reston, VA.

American Society of Civil Engineers. 1998. SEI/ASCE 24-98. *Flood Resistant Design and Construction*. Reston, VA.

Federal Emergency Management Agency. 1986. *Floodproofing Non-Residential Structures*. FEMA 102. Washington, DC.

Federal Emergency Management Agency. 1999. *Protecting Building Utility Systems From Flood Damage*. FEMA 348. Washington, DC.

Federal Emergency Management Agency. 2001. *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures*. FEMA 259. Washington, DC.

International Code Council. 2000. *International Building Code*. Birmingham, AL.

International Code Council. 2000. *International Residential Code*. Birmingham, AL.

Masonry Standards Joint Committee. 1999. ACI 530-99/ASCE 5-99/TMS 402-99. *Building Code Requirements for Masonry Structures*.

National Association of Home Builders Research Foundation, Inc. 1977. *Manual for the Construction of Residential Basements in Non-Coastal Flood Environs*. Upper Marlboro, MD. March.

National Association of Home Builders Research Center, Inc. 2000. *Residential Structural Design Guide: 2000 Edition*. Upper Marlboro, MD.

National Concrete Masonry Association. 2000. TR121. *Concrete Masonry Design Tables*. Herndon, VA.

Glossary

Base Flood – The flood that has a 1-percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood).

Basement – Any area of a building having its floor subgrade (below ground level) on all sides.

Community – Any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or Alaska Native village or authorized native organization, which has the authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

Federal Emergency Management Agency (FEMA) – The independent Federal agency that, in addition to carrying out other activities, administers the NFIP.

Federal Insurance and Mitigation Administration (FIMA) – The component of FEMA directly responsible for administering the flood hazard identification, floodplain management, and flood insurance activities of the NFIP.

Flood Insurance Rate Map (FIRM) – The insurance and floodplain management map issued by FEMA that identifies, on the basis of detailed or approximate analysis, areas of 100-year flood hazard in a community.

Floodprone area – Any land area susceptible to being inundated by flood water from any source.

New construction/structure – For floodplain management purposes, new construction means structures for which the start of construction commences on or after the effective date of a floodplain management regulation adopted by a community and includes subsequent improvements to the structure. For flood insurance purposes, these structures are often referred to as "post-FIRM" structures.

Special Flood Hazard Area (SFHA) – Area subject to inundation by the base flood, designated Zone A, A1-30, AE, AH, AO, V, V1-V30, or VE.