# Elevation Certificate Workshop Outline

1. **Introductions (15 Minutes)**
    a. Workshop Objectives

2. **NFIP Background (30 Minutes)**
    a. NFIP Acronyms and Basic Definitions
    b. FEMA NFIP Documents
    c. Brief Background to the NFIP

3. **The New Elevation Certificate (1 & ½ Hours)**
    a. Elev. Certificates Roll in the NFIP
    b. New Changes in the Elev. Certificate
        i. Section by Section Review
    c. Building Diagram Review
        i. Building Diagram "Quiz"

4. **Completing the Elevation Certificate (1 & ½ Hours)**
    a. Examples of Various Building Situations
        i. Elev. Certificate Completion "Quiz"
        ii. Hands-On Problems

5. **Wrap-Up (15 Minutes)**
    a. Where to get More Information
    b. Questions

# National Flood Insurance Program

## Elevation Certificate Workshop

# Salina Seminar Series

Sponsored By:

The Kansas Society of Land Surveyors

(Salina Chapter)

Presented By:

L. Scott Samuels, P.E., CFM

Central Missouri Engineering Services, LLC (CMES)

# Workshop Overview

- Introduction & Overview
- Workshop Objectives
- The NFIP and the Elevation Certificate
  - Acronyms & Basic Definitions
- The New 2009 Elevation Certificate
  - Elev. Certificates Role in the NFIP
  - Review of Changes
  - Building Diagram Review & “Quiz”

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# Workshop Overview

- Completion of the Elevation Certificate
  - Various Real World Examples
  - Elev. Certificate Completion “Quiz”
  - Elev. Certificate Problems
- Additional Information
- Questions & Adjournment

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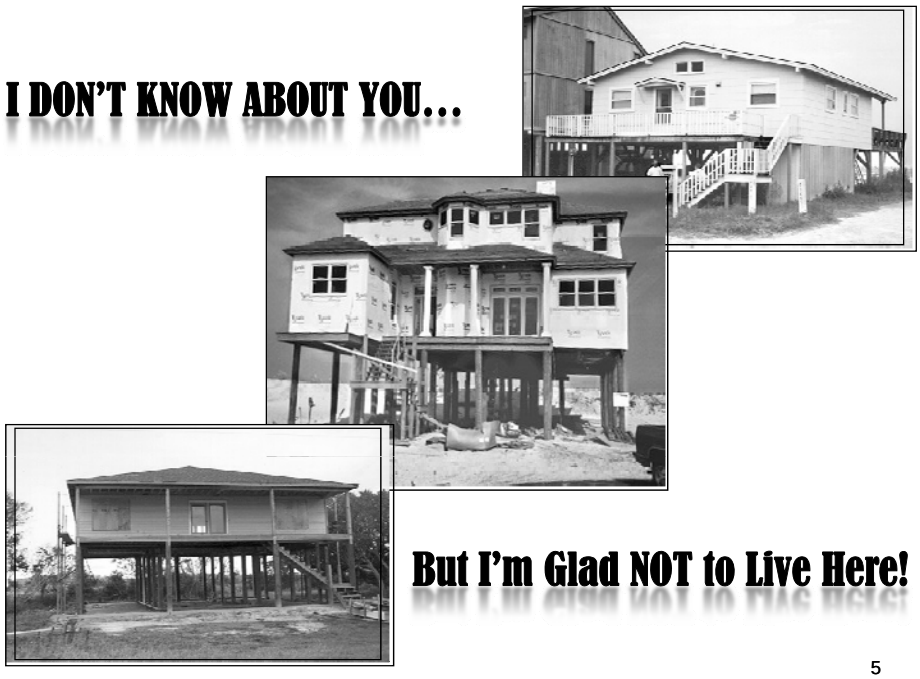
# Introductions

- Participant Introductions
  - Name / Job Responsibility
  - Company or Community Representing
- Workshop Material
  - Presentation Slides Notebook
  - Reference Material

4

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## Workshop Objectives

- Explain the role of the Elevation Certificate in the National Flood Insurance Program.
  - Insurance, Compliance, Amendments
- Provide participants with the basic understanding for completing the Elevation Certificate.

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# The National Flood Insurance Program

Basic Terminology

&

Program History

# NFIP Acronyms

- NFIP – National Flood Insurance Program
- FIRM – Flood Insurance Rate Map
- FIS – Flood Insurance Study
- SFHA – Special Flood Hazard Area
- BFE – Base Flood Elevation
- LAG – Lowest Adjacent Grade
- HAG – Highest Adjacent Grade

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# NFIP Definitions

- Special Flood Hazard Area (SFHA)
  - Areas subject to the 1%, or greater, annual chance of flooding in any given year. A.K.A. – the "100-year" floodplain.
- Base Flood Elevation (BFE)
  - The water surface elevation resulting from the flood that has a 1% chance of being equaled, or exceeding that level, in any given year. A.K.A. – the "100-year" elevation.

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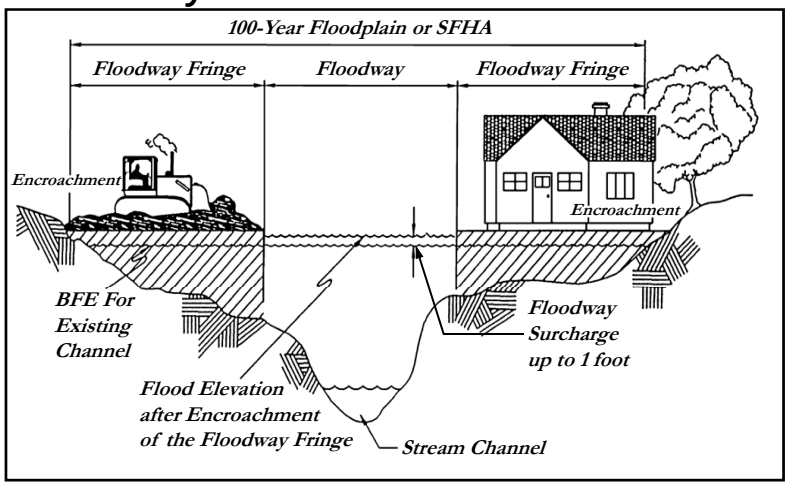
# NFIP Definitions (cont.)

- Floodway

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# NFIP Definitions

- Structure
  - Four Walls and a Roof or Above Ground Liquid or Gas Storage Tanks (Compliance).
- Enclosure
  - That Portion of an Elevated Building below the BFE that is Either Partially or Fully Enclosed by Rigid Walls.
- Basement
  - An Enclosed Area Sub-grade on all Four Sides.

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# NFIP Definitions (cont.)

- Lowest Adjacent Grade (LAG)
  - The lowest (finished) elevation of the ground level next to the building foundation, including window wells, deck posts, basement walkouts, etc.
- Highest Adjacent Grade (HAG)
  - The highest (finished) elevation of the ground level next to the building foundation.

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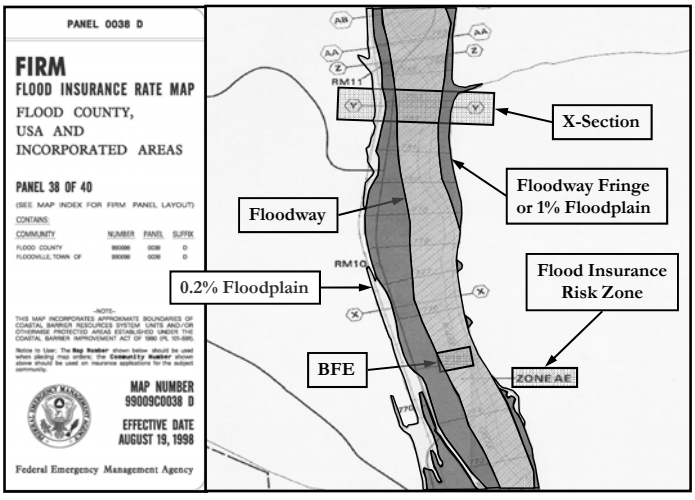
# NFIP Documents

- Flood Insurance Rate Map (FIRM)

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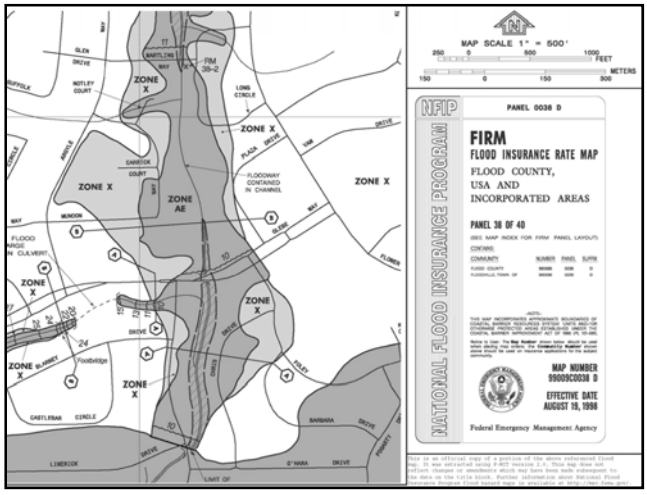
# NFIP Documents (cont.)

- FEMA FIRMette.

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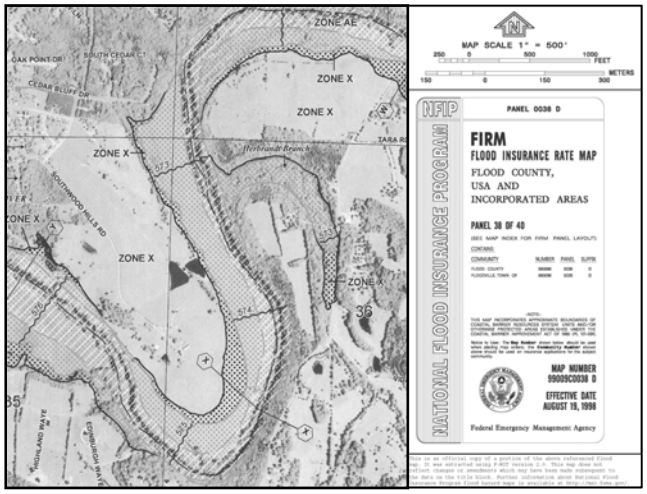
# NFIP Documents (cont.)

- Digital Flood Insurance Rate Map (DFIRM)




15

# NFIP Documents (cont.)

- The FIRMette is an official copy of a portion of the FIRM panel and is considered to be a legal document for NFIP purposes.
  - This is not true for copies of the FIRM that are reproduced using an office photocopier.
- FIRMette's can be created online by visiting the Map Service Center at: http://msc.fema.gov
- A FIRMette tutorial is available on the MSC homepage.

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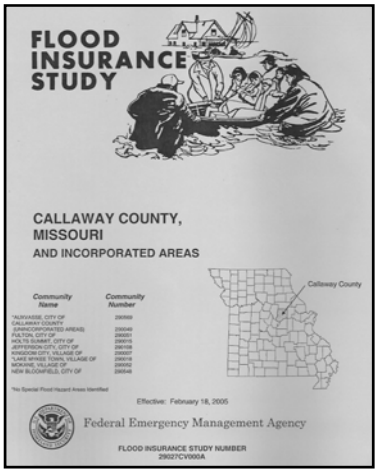
# NFIP Documents (cont.)

- Flood Insurance Study (FIS)

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# NFIP Documents (cont.)

- FIS - Floodway Data Table (FDT)

| 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 | 861 | 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

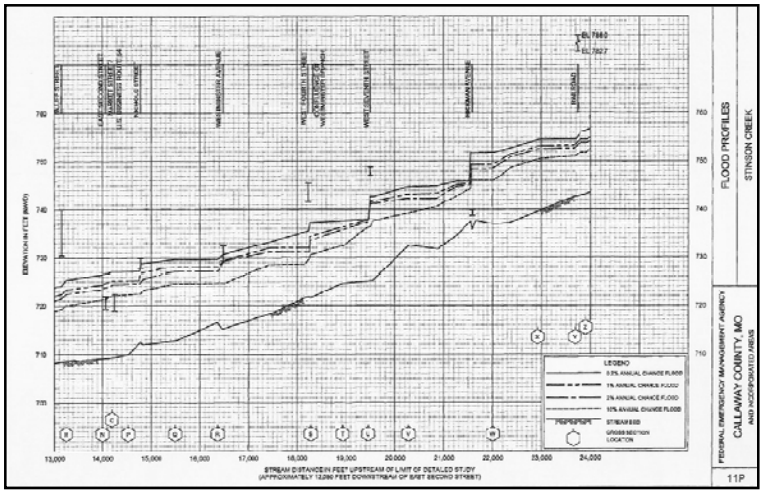
FLOODWAY DATA

ROCKY RIVER

18

# NFIP Documents (cont.)

- FIS - Stream Profile

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# NFIP History

- Created to:
  - Improve basic knowledge about flood hazards.
  - Help cover individuals from flood losses through the availability of flood insurance.
  - Reduce future flood damage through State and Local floodplain management ordinances.
  - Reduce Federal expenditures for disaster assistance & flood control projects.

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# NFIP History (cont.)

- Why Communities Regulate the Floodplain:
  - To provide some measure of protection for new development in the SFHA's.
  - To ensure disaster assistance is available to the community and individuals.
  - Makes available federally backed mortgages.
  - To protect against litigation actions.

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## NFIP History (cont.)

- To Participate in the NFIP the Community has agreed to:
  - Adopt & enforce the NFIP regulations.
  - Require permits for all SFHA development.
  - Require all new residential structures to be elevated to, or above, the BFE.
  - Obtain proof of compliance with local floodplain ordinance for new structures (residential and non-residential).

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## NFIP History (cont.)

- The Elevation Certificate is an Administrative Tool Created by the Insurance Side of the Program.
- It is used to:
  - Determine the proper flood insurance rating for the structure (Required).
  - Provide proof of compliance with local ordinance (Optional, for CRS Required).
  - Can be used to support LOMA's (Not Recommended for LOMR-F's).

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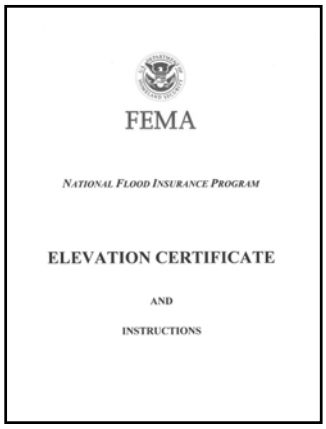
# The Elevation Certificate




# Pre or Post FIRM?

- If Completing an Elev. Certificate for New Development, for Insurance Purposes, it is Most Likely to be Post-FRIM.
- If Completing an Elev. Certificate for an Existing Structure, the Date of Construction versus the Date the Community Received their Initial Effective FIRM Must be Checked.

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## Pre or Post FIRM? (cont.)

- For REAL Pre-FIRM Structures, which are Structures Built BEFORE the Communities Initial Effective FIRM, or all Structures built before 12/31/74, No Elev. Certificate is Required, Since they will Qualify for the Pre-FIRM Subsidized Insurance Rate.
  - Assuming the Structure's Bottom Floor is BELOW the Effective BFE.

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## Pre or Post FIRM? (cont.)

- However, if a REAL Pre-FIRM Structures Lowest Floor is ABOVE the Effective BFE, then an Elev. Certificate can be Completed Since the Structure Should Qualify for the Lower "Above the BFE" Insurance Rates.
- The Problem for Homeowners is when the Structure is Post-FIRM, but Pre-Community Participation.

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# Pre or Post FIRM? (cont.)

- For Post-FIRM, Pre-Community Participation, an Elev. Certificate will be Required to Properly Rate the Structure.
  - If the bottom floor is ABOVE the Effective BFE, this is not a problem.
  - If the bottom floor is BELOW the Effective BFE, then they could be looking at a substantial flood insurance premium.

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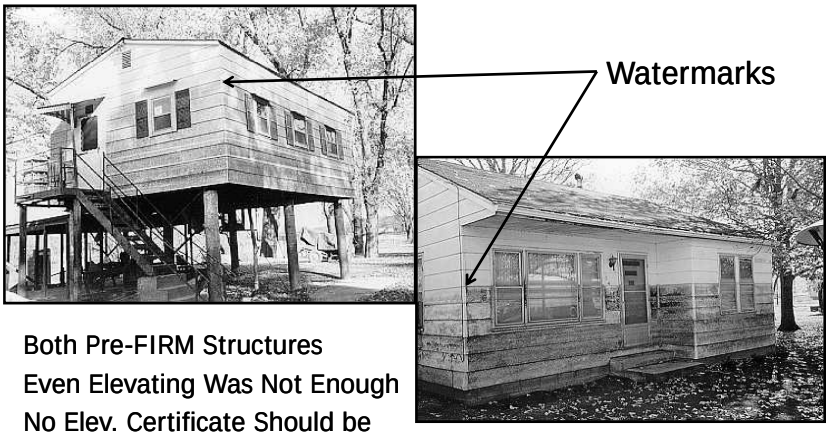
# Pre or Post FIRM? (cont.)




- Both Pre-FIRM Structures
- Even Elevating Was Not Enough
- No Elev. Certificate Should be Submitted for Insurance Rating

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## Grandfather Rules

- Applies to houses with existing flood insurance and the:
  - Effective Maps are Revised or
  - The Structure is Sold.
- Effects Insurance Premium Rate not compliance issues.
- More information in workshop package.
- NFIP Insurance Manual can be found at: www.fema.gov/nfip/manual.shtm

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## New Changes Overview

- New Required Additions to the Elevation Certificate:
  - Question about "Engineered Flood Openings" in the Enclosure or Attached Garage.
  - Potentially Two (2) LAG's now required on the new forms.
    - Only needed to have one (1) LAG per structure on the old Elevation Certificate

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## New Changes Overview (cont.)

- New Required Additions to the Elevation Certificate (cont):
  - The Height of the Flood Opening can now be measured from the INSIDE of the enclosure.
    - Before it could only be measured from the Outside of the Enclosure or Attached Garage to the Exterior Adjacent Grade

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## New Changes Overview (cont.)

- Clarification of some Building Diagrams:
  - Ten (10) Building Diagrams now.
  - Diagram 1 became Diagram 1A and Diagram 2A was added.
  - Brand New Diagram 9 was added (Sub-Grade Crawlspace).
    - This Situation used to be considered a Basement

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# Section A Changes

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

**ELEVATION CERTIFICATE**

Important: Read the instructions on pages 1-9.

OMB No. 1660-0008
Expires March 31, 2012

**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) No. 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) No. 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

Item A8.b and Item A9.b now allow the opening height Measurement to be taken from the interior of the enclosure.

Item A8.d and Item A9.d Inquiring if the Existing Openings are "Engineered Flood Openings" was added.

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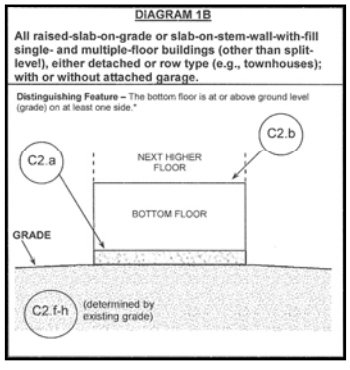
# Section A (cont.)

- Building Diagrams:
  - Diagram 1 (Slab-on-Grade) became Diagram 1A
  - Diagram 1B "Raised-Slab-On-Grade" was added

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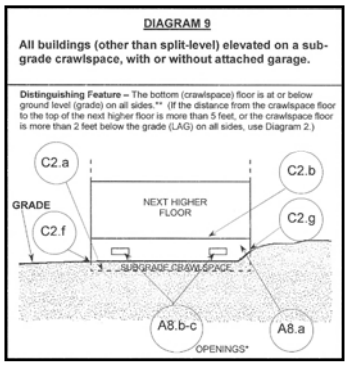
# Section A (cont.)

- Building Diagrams:
  - Diagram 9 “Sub-Grade Crawlspace” was added
  - This use to be considered a “Basement” (Diagram 2)
    - If Sub-Grade more than 2 feet, or if Crawlspace is over 5 feet high, then still need to use Diagram 2

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# Section A (cont.)

- Section A8.b and A9.b:
  - The instructions have been changed to allow for the Height of the Flood Opening to be measured from the “Interior Grade”, or the inside of the enclosure, instead of just from the “Exterior Grade”
  - If measuring the Height of the Flood Opening from the Interior Grade it must be noted in the Comment Section of the Elevation Certificate (Section D, Page 2)

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# Section A (cont.)

- Section A8.d and A9.d:
  - "Engineered Flood Openings" would be those openings that either have:
    - A Certified Letter from a Professional Engineer, or Architect, stating the non conformance of the openings meets the scientific requirements of FEMA Technical Bulletin 1-08 or
    - A Manufactured Flood Vent from a third party vendor (ex. Smart Vents or Flood Vent products)
  - These Vendors typically have a certified letter proving compliance with Tech. Bulletin 1-08.

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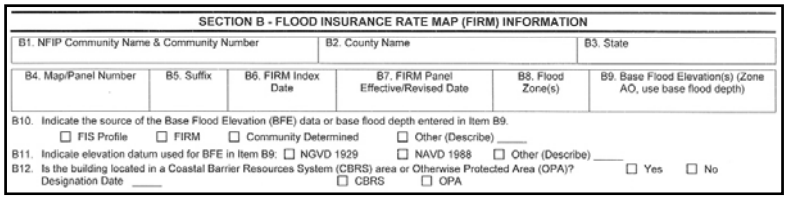
# Section B Changes



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 (Describe) ____

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

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

No Changes from Previous Edition

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# Section B (cont.)

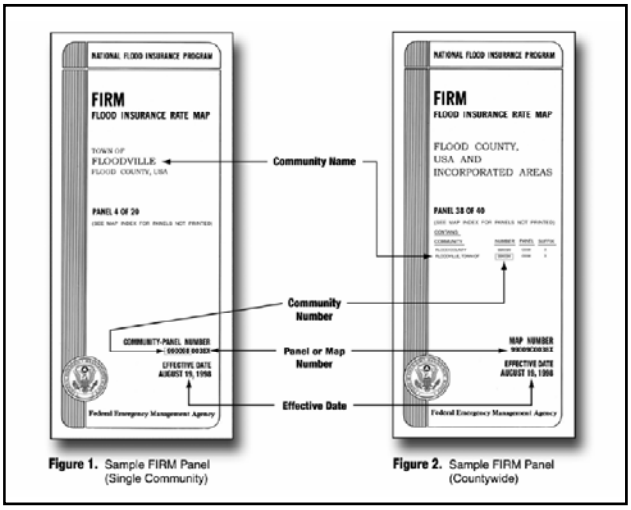


**Figure 1.** Sample FIRM Panel (Single Community)

**Figure 2.** Sample FIRM Panel (Countywide)

Items B1 through B8 – Obtained from Effective FIRM

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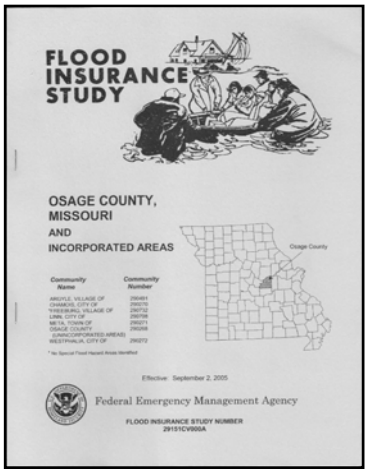
# Section B (cont.)




Items B9 through B11 – Obtained from Effective FIS

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# Section B (cont.)

- Tutorials for Using FEMA Documents to Determining BFEs can be accessed at: www.fema.gov.
- All FEMA Tutorials are listed at:

www.fema.gov/plan/prevent/fhm/ot_main.shtm

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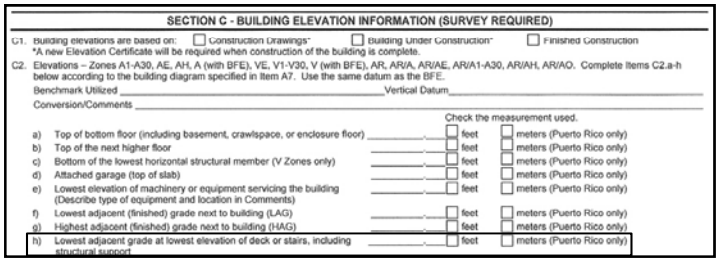
# Section C Changes



SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

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

Benchmark Utilized _____ Vertical Datum _____

Conversion/Comments _____

| | | Check the measurement used. | |
|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) | ☐ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) | ☐ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | ☐ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) | ☐ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) | ☐ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | ☐ feet | ☐ meters (Puerto Rico only) |

NOTE: Section C is Required to be Completed for all Structures Located Within a Detailed Study Area with an Established BFE

Section C is not Required for Zone-AO or Approx. Zone-A's if no BFE is Listed

Item C2.h – LAG of "Deck or Stairs, Including Structural Support" was Added

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# Section C (cont.)

- Item C3.h:
  - Instead of finding the LAG for the Entire Structure, we now need to find the LAG Adjacent to the Structure, and out away from the Structure (If Applicable).

| | | | |
|---|---|---|---|
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | _____.___ ☐ feet | ☐ meters (Puerto Rico only) |

  - Item C3.h only needs to be completed if the Elevation Certificate is being used to support a Letter of Map Amendment.

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# Section D Changes

**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION**

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

☐ Check here if comments are provided on back of form.

Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No

PLACE SEAL HERE

Certifier's Name | License Number

Title | Company Name

Address | City | State | ZIP Code

Signature | Date | Telephone

FEMA Form 81-31, Mar 09 | See reverse side for continuation. | Replaces all previous editions

Question added asking if the Latitude & Longitude Provided in Section A was determined by a PLS

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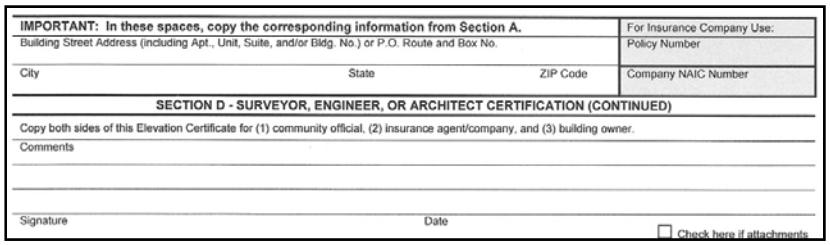
# Section D (cont.)



| IMPORTANT: In these spaces, copy the corresponding information from Section A. | For Insurance Company Use: |
|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | Policy Number |
| City State ZIP Code | Company NAIC Number |

**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)**

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

Comments

Signature Date ☐ Check here if attachments

Section D Still Continues on Page 2 of the Elevation Certificate

Second Signature Requirement Added in 2006

Signature Provides Validation of Property Address and Comments Listed

Comment Section Should List any Machinery Certified in C2.e

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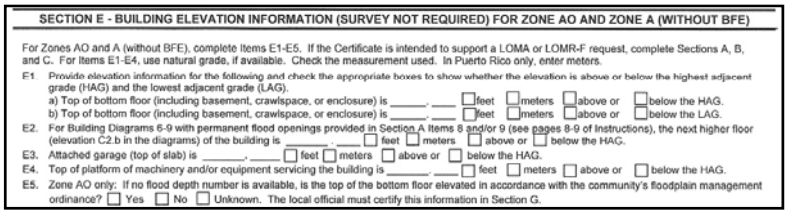
# Section E Changes



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

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

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____, ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____, ____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6-9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 8-9 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____, ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is _____, ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is _____, ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

NOTE: Section E is Only Completed When No BFE was Determined in Zone-AO or Zone-A

Item E1.b and Item E3 added in 2006

"Use Natural Grade, If Available." Language was Moved in 2006 but still Included on Form

47

# BFE's in Unnumbered A-Zones

http://gis.kda.ks.gov/ksflood/

Kansas Digital Floodplain Map

ZOOM IN TO ANY AREA

AND THE LAYERS APPEAR

48

# Section F Changes

**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

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

Property Owner's or Owner's Authorized Representative's Name

Address | City | State | ZIP Code

Signature | Date | Telephone

Comments

☐ Check here if attachments

NO CHANGES!

49

# Section G Changes

**SECTION G - COMMUNITY INFORMATION (OPTIONAL)**

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8 and G9.

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

| G4. Permit Number | G5. Date Permit Issued | G6. Date Certificate Of Compliance/Occupancy Issued |
|---|---|---|
| | | |

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

G8. Elevation of as-built lowest floor (including basement) of the building _____. ____ ☐ feet ☐ meters (PR) Datum_____

G9. BFE or (in Zone AO) depth of flooding at the building site _____. ____ ☐ feet ☐ meters (PR) Datum_____

G10. Community's design flood elevation _____. ____ ☐ feet ☐ meters (PR) Datum_____

Local Official's Name Title

Community Name Telephone

Signature Date

Comments

☐ Check here if attachments

FEMA Form 81-31, Mar 09 Replaces all previous editions

Item G10 was added (Community's Design Flood Elevation)

50

# Building Photographs

**Building Photographs**
See Instructions for Item A6.

For Insurance Company Use:

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

City State ZIP Code Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page on the reverse.

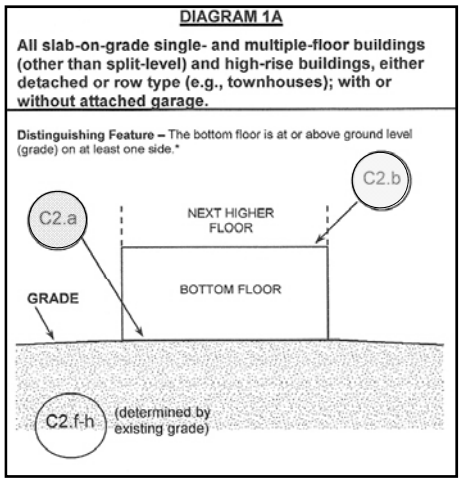
If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page, following.

Picture Requirement has been Mandatory Since 12/31/06

Directions for Completing Listed in Item A6 of the Instructions

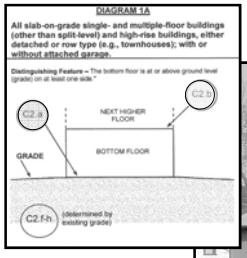
51

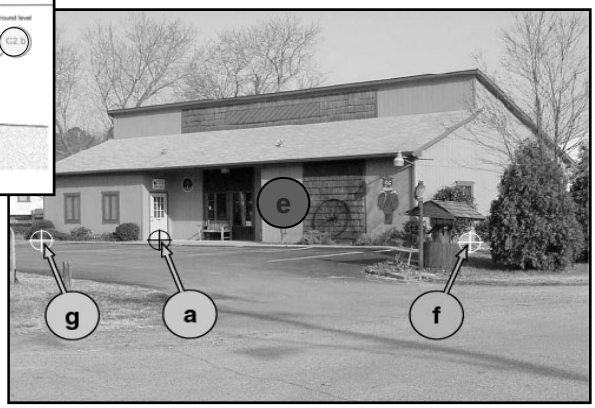
# Building Diagrams




52

# Building Diagrams (cont.)



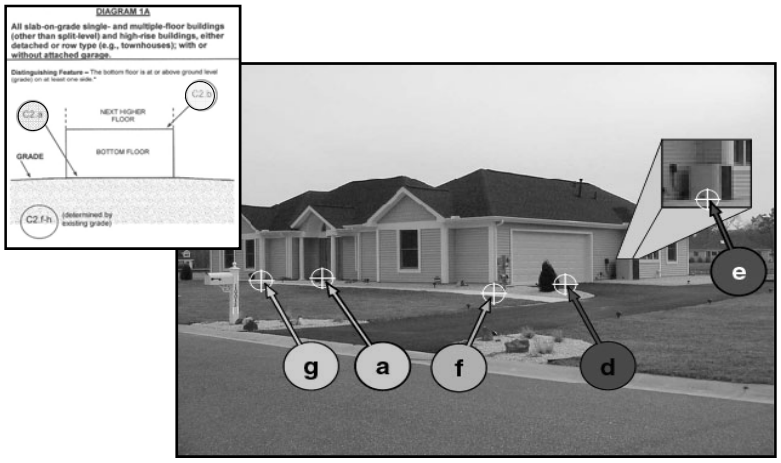




NOTE: Item C2.e (machinery) – Even Though it is not Listed Above Would Need to be Completed

Slab-on-Grade Without Attached Garage

53

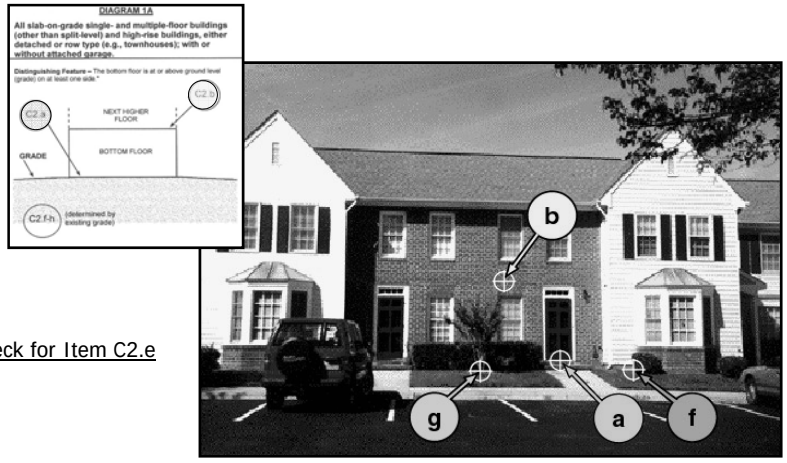
# Building Diagrams (cont.)




Slab-on-Grade With Attached Garage

54

# Building Diagrams (cont.)

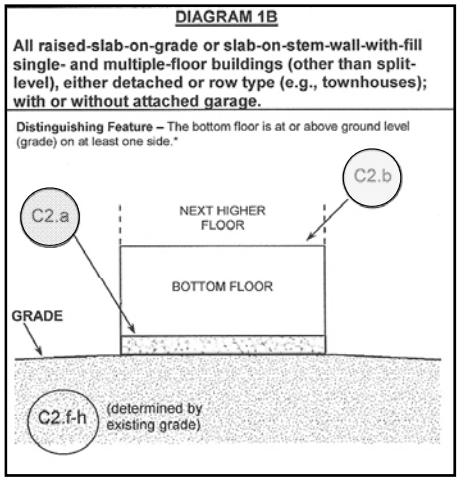



Check for Item C2.e

Slab-on-Grade, Multiple Story Row Type, Without Attached Garage

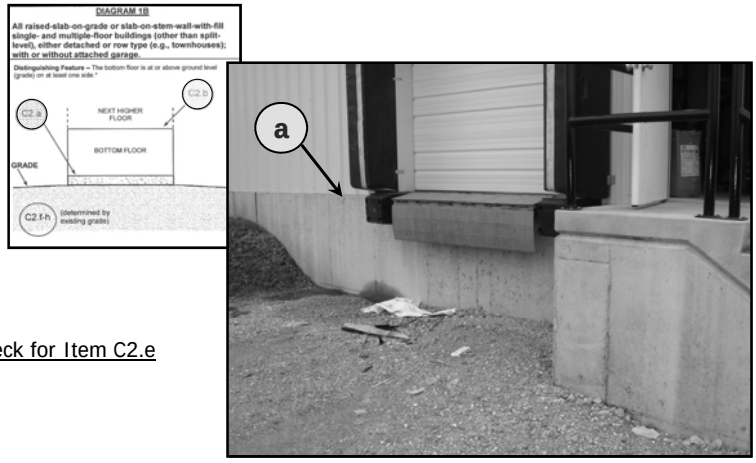
55

# Building Diagrams (cont.)




56

# Building Diagrams (cont.)

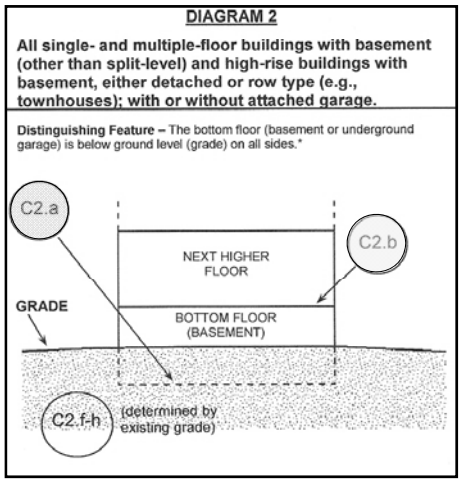



Check for Item C2.e

Slab-on-Stem-Wall-with-Fill, Without Attached Garage

57

# Building Diagrams (cont.)




58

# Building Diagrams (cont.)

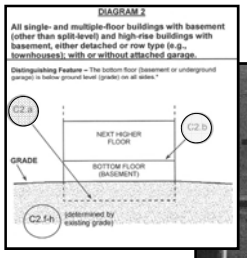
Basement? _____ Basement? _____

Hint: Below Grade on ALL Sides

Basement Review

59

# Building Diagrams (cont.)

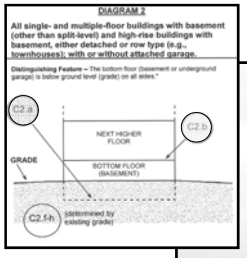



Check for Item C2.e


Basement Foundation, Multiple Story, Without Attached Garage

60

# Building Diagrams (cont.)

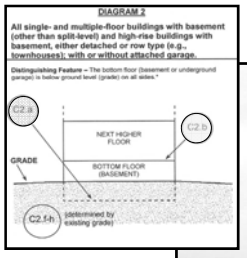



Check for Item C2.e

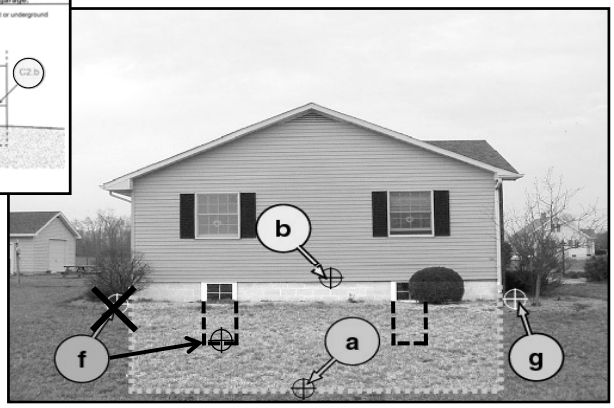

Basement Foundation, Single Story, Without Attached Garage

61

# Building Diagrams (cont.)



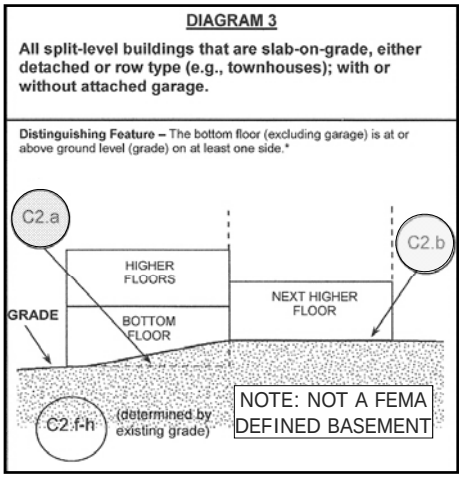

Check for Item C2.e




Basement Foundation, Single Story, Without Attached Garage

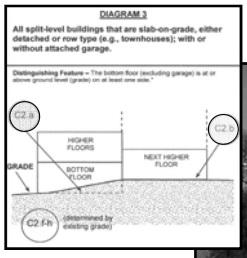
62

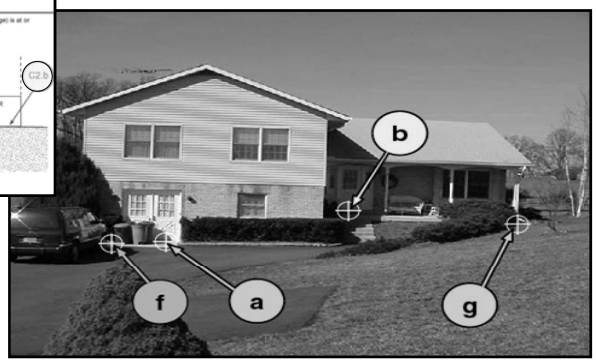
# Building Diagrams (cont.)




63

# Building Diagrams (cont.)



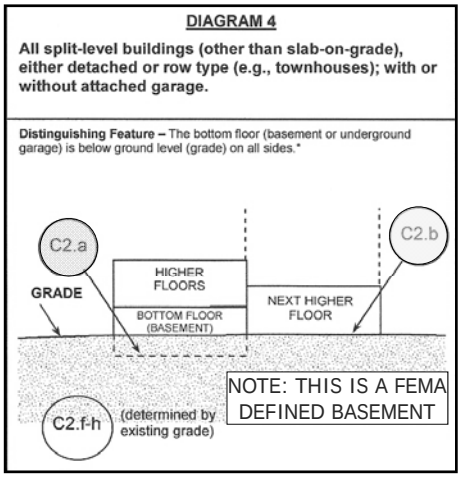




Check for Item C2.e

Slab-on-Grade, Split-Level, Without Attached Garage

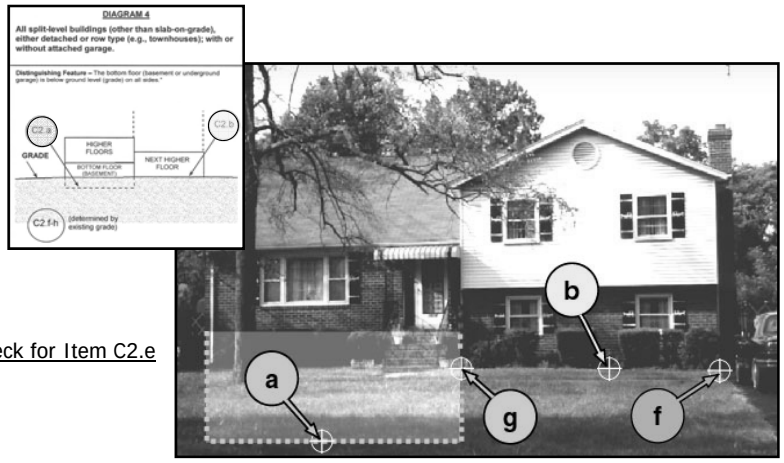
64

# Building Diagrams (cont.)




65

# Building Diagrams (cont.)

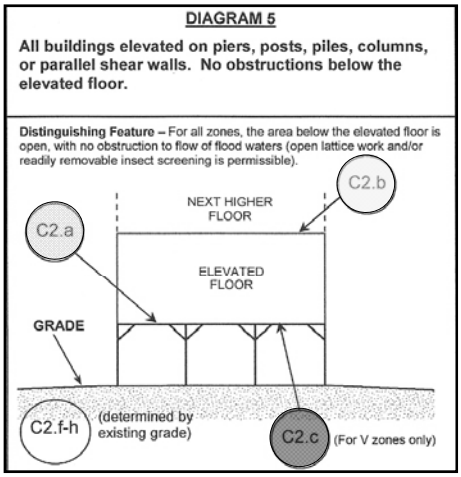



Check for Item C2.e

Basement Foundation, Split-Level, Without Attached Garage

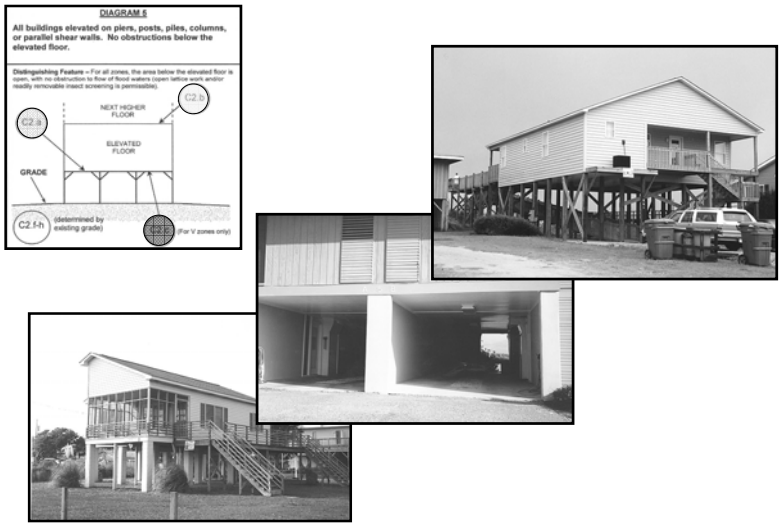
66

# Building Diagrams (cont.)



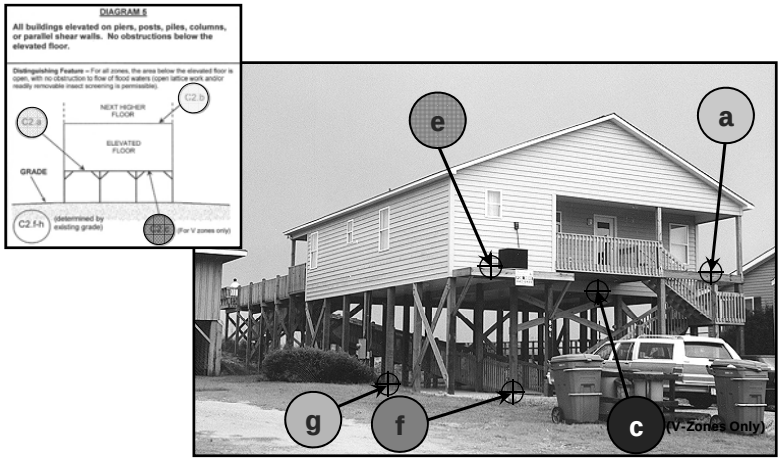

67

# Building Diagrams (cont.)




68

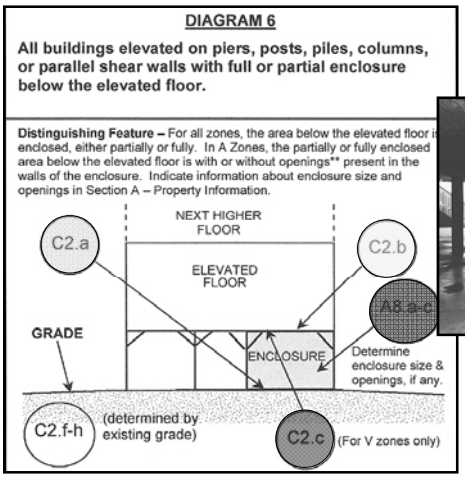
# Building Diagrams (cont.)




Elevated on Piers, Single Level, No Obstructions

69

# Building Diagrams (cont.)




"Permanent" Enclosure With Openings in A-Zones

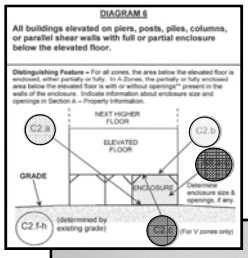
70

# Building Diagrams (cont.)


Elevated on Piers, Attached Garage, Partial Obstruction

71

# Building Diagrams (cont.)




Breakaway Walls for Enclosure in V-Zones

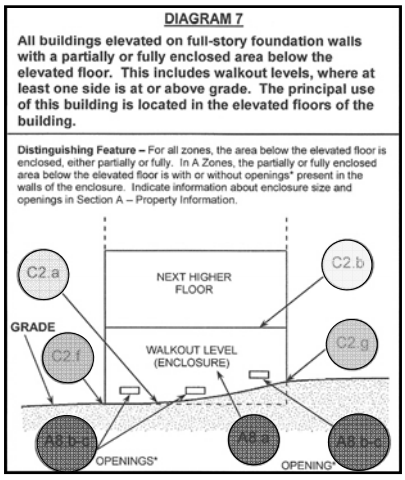
72

# Breakaway Walls

- Collapse Under Wind and Water Loads Without Causing Collapse, Displacement, or Structural Damage to the Elevated Portion of the Structure or Supporting Foundation (i.e. not part of the structural support of the building).
- Design Safe Loading Resistance of not Less Than 10 or More Than 20 Pounds per Square Foot.

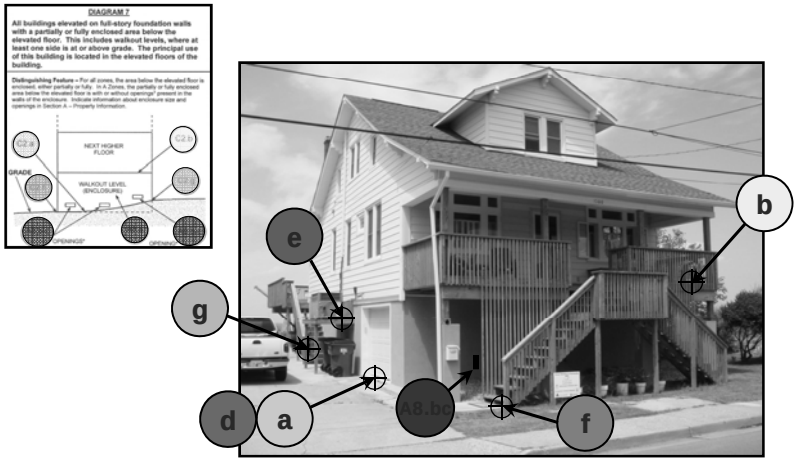
73

# Building Diagrams (cont.)




74

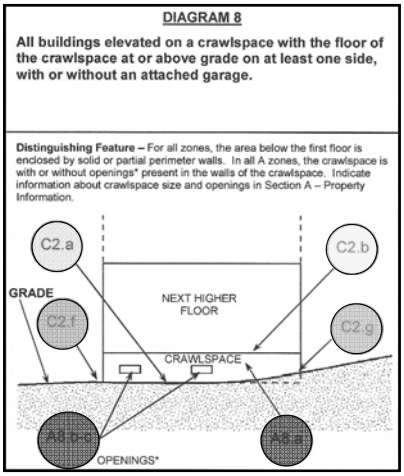
# Building Diagrams (cont.)




Full Story Basement Foundation, Fully Enclosed, Used as the Garage

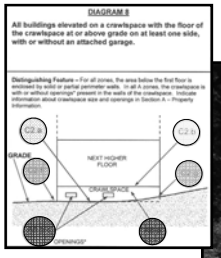
75

# Building Diagrams (cont.)

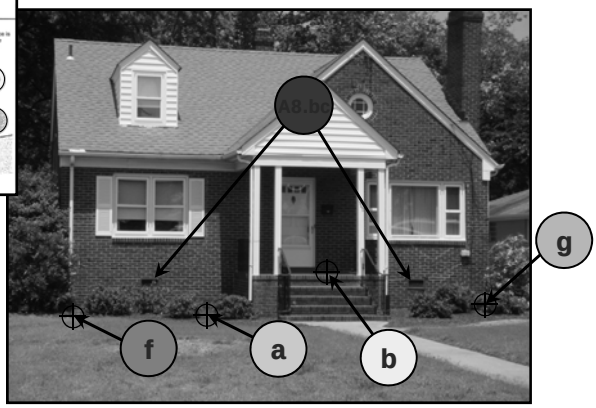



76

# Building Diagrams (cont.)



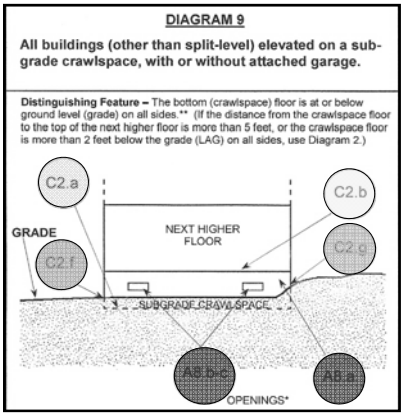
Check for Item C2.e




Crawl Space Foundation, Fully Enclosed, Without Attached Garage

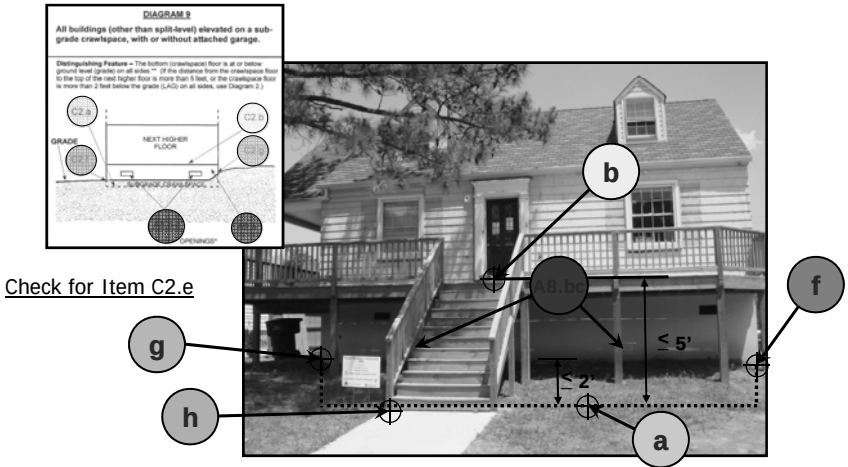
77

# Building Diagrams (cont.)




78

# Building Diagrams (cont.)




Check for Item C2.e

Sub-Grade Crawl Space Foundation, Fully Enclosed

79

## Openings

- Permanent Openings in a Wall that Allows the Free Passage of Water in Both Directions without Human Intervention.
  - Windows, Doors, or Garage Doors are not considered to be an NFIP "Opening"
- Openings Shall be no More than One (1) Foot above the Adjacent Grade to Count as a FEMA Opening.

80

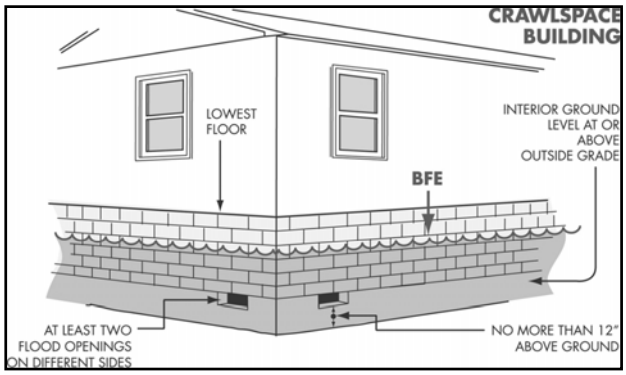
## Openings (cont.)

- For a Structure to be Compliant with Minimum NFIP Regulations, there Shall be a Minimum Number of Two Openings for each Enclosed Area
- The Area of the Opening in Square Inches Equal Shall be Greater Than or Equal to the Square Footage of the Enclosure.

81

# Openings (cont.)

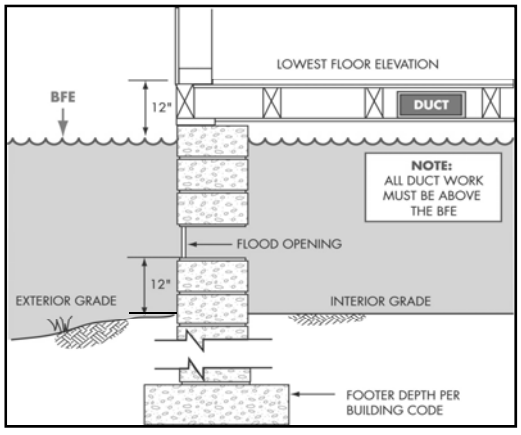
- Slides Taken From Missouri's "Quick Guide".




PLAN VIEW

82

# Openings (cont.)




The Preceding Slides are Based on FEMA Technical Bulletin 1-08

PROFILE VIEW

83

## Openings (cont.)

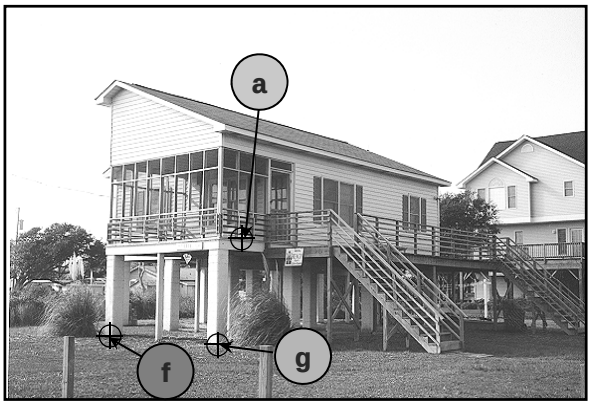
84

## Openings "Quiz"

So Where Are the Openings?

85

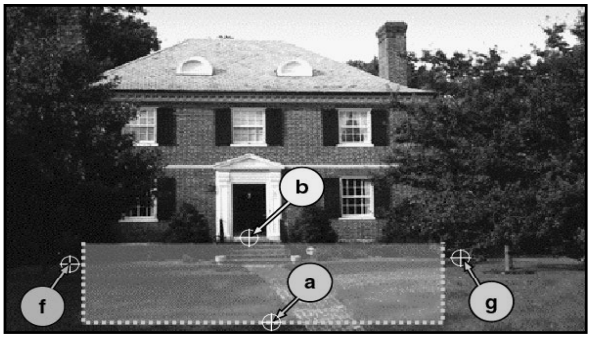
# Building Diagram "Quiz"




Elevated on Columns, Single Level, No Obstructions : Diagram No. _____

86

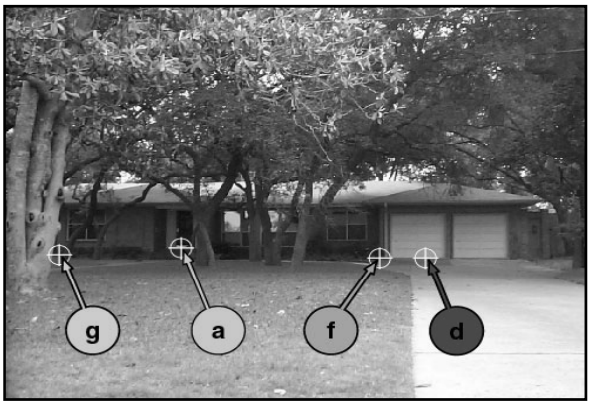
# Building Diagram "Quiz"




Basement Foundation Without Attached Garage: Diagram No. _____

87

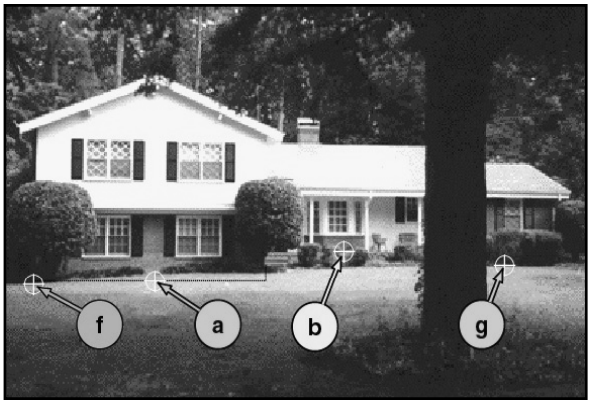
# Building Diagram "Quiz"




Slab-on-Grade With Attached Garage: Diagram No. _____

88

# Building Diagram "Quiz"




Split-Level Walkout Without Attached Garage: Diagram No. _____

89

# Building Diagram "Quiz"

Diagram No. _____

90

# Building Diagram "Quiz"

Diagram No. _____

91

# Building Diagram "Quiz"

Diagram No. _____

92

# Building Diagram "Quiz"

Diagram No. _____

93

# Building Diagram "Quiz"

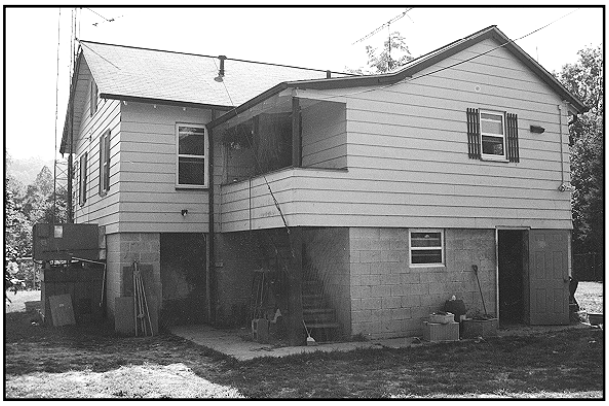


Diagram No. _____

94

# Building Diagram "Quiz"

Diagram No. _____

95

# Building Diagram "Quiz"

Diagram No. _____

96

# The Elevation Certificate

Hands-On Examples

# Warm Up

- Building Diagram 2
- Finished Construction
- Zone AE, BFE = 909.0 ft
- Elevations:
  - C2.a = 903.2 ft
  - C2.b = 909.5 ft
  - C2.e = 903.2 ft
  - C2.f = 903.2 ft
  - C2.g = 906.5 ft

- Is the Lowest Floor Above or Below BFE and by How Much?

98

# Warm Up (cont.)

- Building Diagram 6
- Finished Construction
- Zone AE, BFE = 712.0 ft
- Elevations:
  - C2.a = 705.5 ft
  - C2.b = 713.0 ft
  - C2.e = 713.0 ft
  - C2.f = 704.9 ft
  - C2.g = 705.2 ft
  - A8.a = 900 sq ft
  - A8.b = 6
  - A8.c = 1296 sq in

- Is this Structure Zone-AE Compliant?

99

# Problems

- Building Diagram 7
- Zone AE, BFE = 500.0 ft
- Elevations:
  - C2.a = _____ ft
  - C2.b = _____ ft
  - C2.e = _____ ft
  - C2.f = _____ ft
  - C2.g = _____ ft
  - A8.a = 700 sq ft
  - A8.b = 4
  - A8.c = 700 sq in


- Is this Structure Zone-AE Compliant?

100

# Problems (cont.)

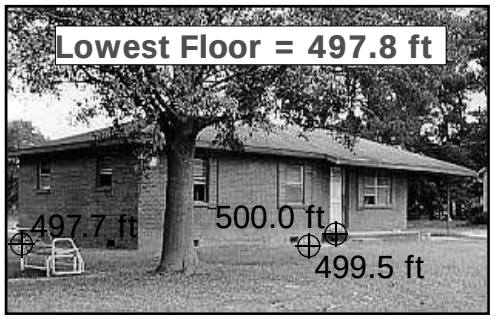
- Building Diagram 1A
- Zone AE, BFE = 500.0 ft
- Elevations:
  - C2.a = _____ ft
  - C2.b = _____ ft
  - C2.e = _____ ft
  - C2.f = _____ ft
  - C2.g = _____ ft
  - Openings = None


- Is this Structure Zone-AE Compliant?

101

# Problems (cont.)

- Building Diagram 8
- Zone AE, BFE = 499.0 ft
- Elevations:
  - C2.a = _____ ft
  - C2.b = _____ ft
  - C2.e = _____ ft
  - C2.f = _____ ft
  - C2.g = _____ ft
  - A8.a = 720 sq ft
  - A8.b = 8
  - A8.c = 776 sq in

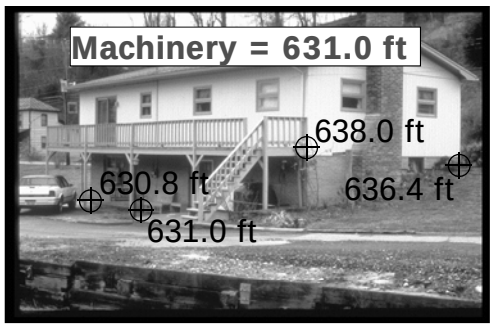



- Is this Structure Zone-AE Compliant?

102

# Problems (cont.)

- Building Diagram 1A
- Zone AE, BFE = 630.0 ft
- Elevations:
  - C2.a = _____ ft
  - C2.b = _____ ft
  - C2.e = _____ ft
  - C2.f = _____ ft
  - C2.g = _____ ft

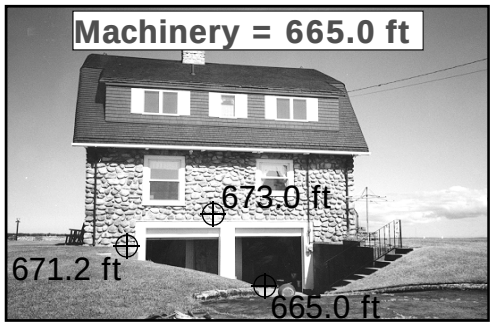



- Is this Structure Zone-AE Compliant?

103

# Problems (cont.)

- Building Diagram 2
- Zone AE, BFE = 668.0 ft
- Elevations:
  - C2.a = _____ ft
  - C2.b = _____ ft
  - C2.d = _____ ft
  - C2.e = _____ ft
  - C2.f = _____ ft
  - C2.g = _____ ft

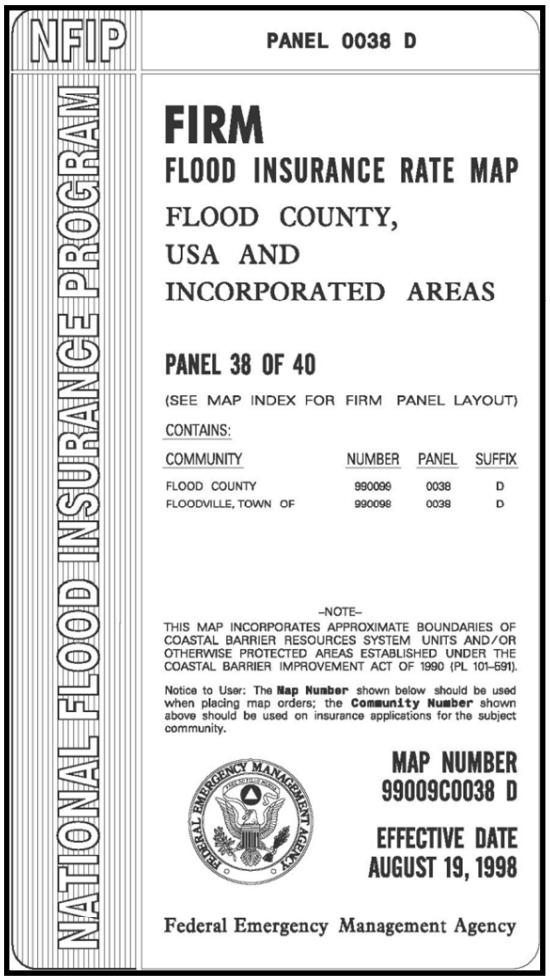



- Is this Structure Zone-AE Compliant?

104

# EXERCISES

# Problem 1



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| FLOOD COUNTY | 990099 | 0038 | D |
| FLOODVILLE, TOWN OF | 990098 | 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).

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**MAP NUMBER**
**99009C0038 D**

**EFFECTIVE DATE**
**AUGUST 19, 1998**

Federal Emergency Management Agency

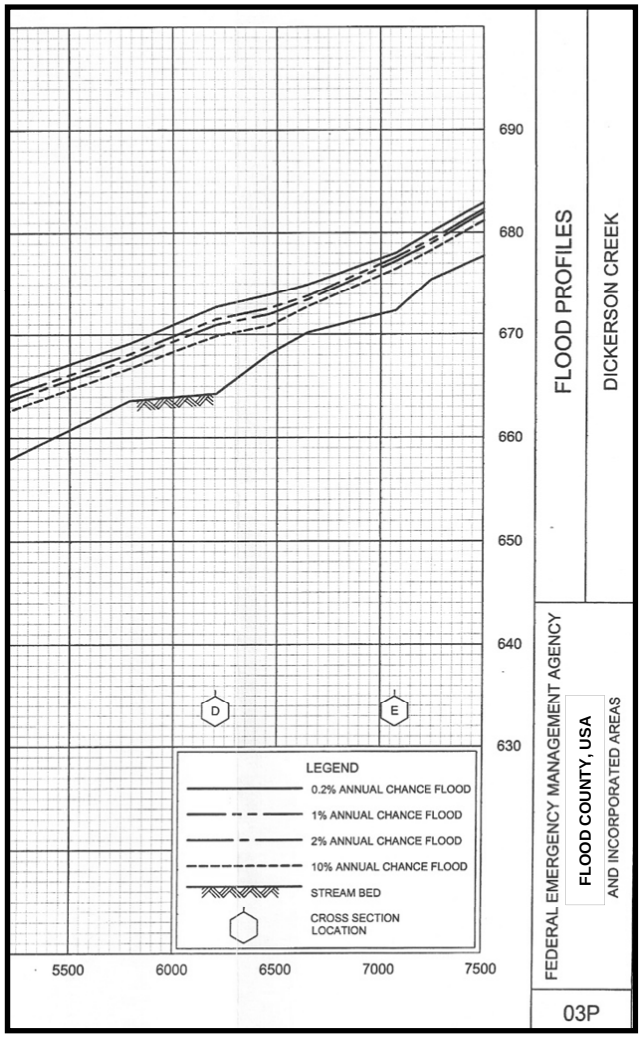

BFE KNOWN

# Problem 1 (cont.)

- Given:
  - FIRM Index Date = FIRM Panel Date
  - Flood County, USA
  - Vertical Datum Used = 1988 (FIRM & BM)
  - BM PID = AB1098
  - Finished Construction
  - Flood Insurance Risk Zone = AE
  - Not Located Within a Protected Area
  - Structure is Located at X-Section “E”
  - No External Servicing Machinery

# Problem 1 (cont.)

- Stream Profile
  - Horizontal Minor Grid Square = 50 ft
  - Vertical Minor Grid Square = 1 ft



# Problem 1 (cont.)

- Floodway Data Table

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE-FLOOD WSEL | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| DICKERSON CREEK | | | | | | | | |
| A | 1,655 | 176 | 913 | 2.7 | 646.6 | 646.6 | 647.3 | 0.7 |
| B | 3,088 | 24 | 150 | 7.8 | 651.0 | 651.0 | 651.4 | 0.4 |
| C | 4,610 | 36 | 206 | 5.6 | 659.6 | 659.6 | 660.2 | 0.6 |
| D | 6,206 | 27 | 165 | 7.0 | 671.5 | 671.5 | 671.8 | 0.3 |
| E | 7,073 | 30 | 144 | 8.1 | 677.6 | 677.6 | 678.1 | 0.5 |
| F | 7,941 | 45 | 185 | 6.3 | 685.4 | 685.4 | 685.5 | 0.1 |
| G | 8,920 | 46 | 159 | 7.3 | 690.9 | 690.9 | 691.0 | 0.1 |
| H | 10,794 | 39 | 126 | 5.7 | 712.8 | 712.8 | 712.8 | 0.0 |
| I | 11,652 | 34 | 74 | 8.4 | 723.4 | 723.4 | 723.4 | 0.0 |

[1]Feet above Binder Lake Dam

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

**FLOOD COUNTY, USA**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**DICKERSON CREEK**

# Problem 1 (cont.)

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) No. 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) No. 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 (Describe) _____

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

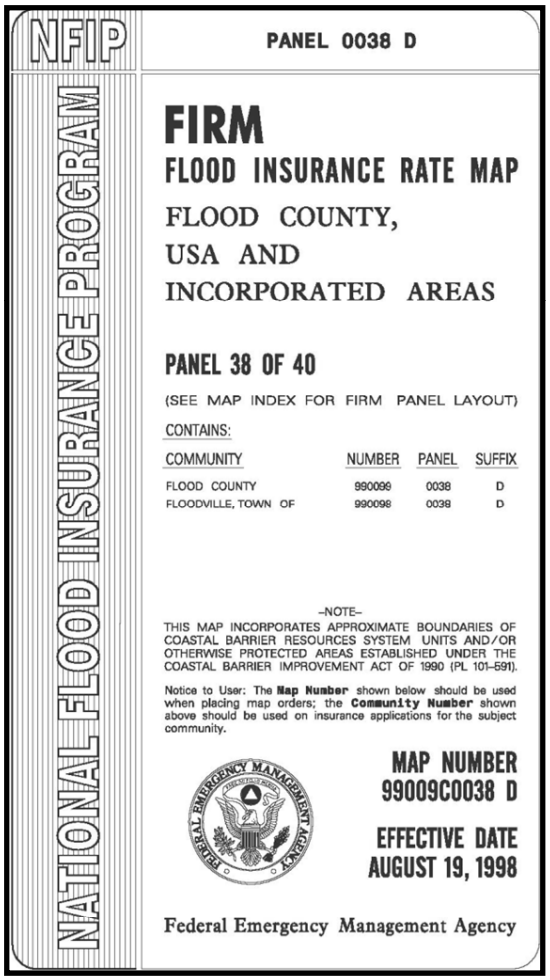
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized _____ Vertical Datum _____

Conversion/Comments _____

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

# Problem 2



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
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| FLOODVILLE, TOWN OF | 990098 | 0038 | D |

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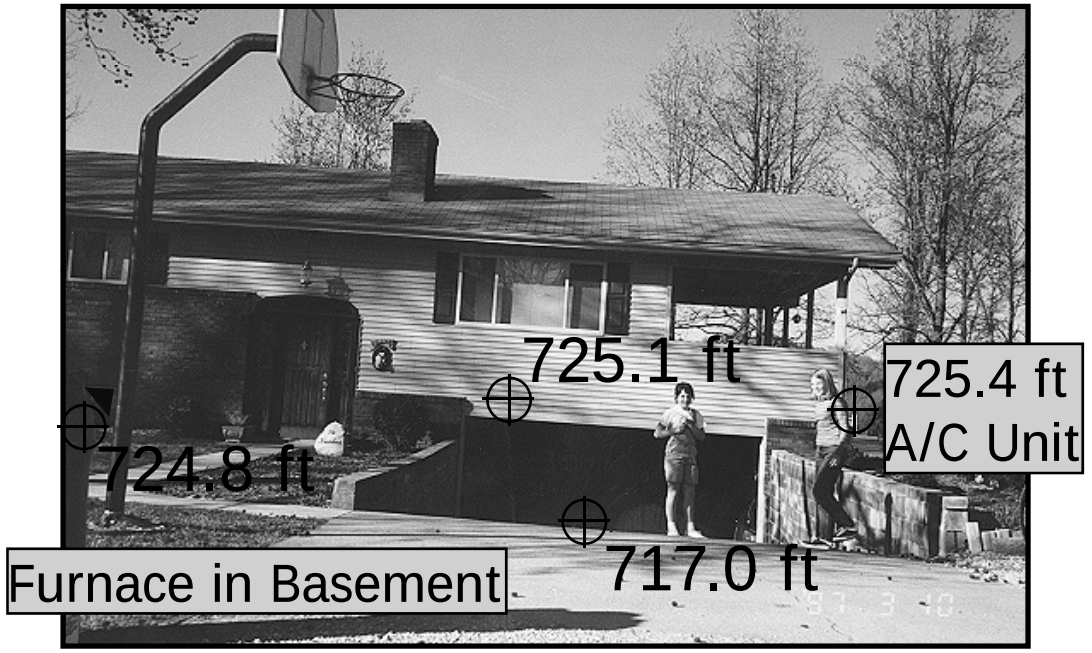
**99009C0038 D**

**EFFECTIVE DATE**
**AUGUST 19, 1998**

Federal Emergency Management Agency



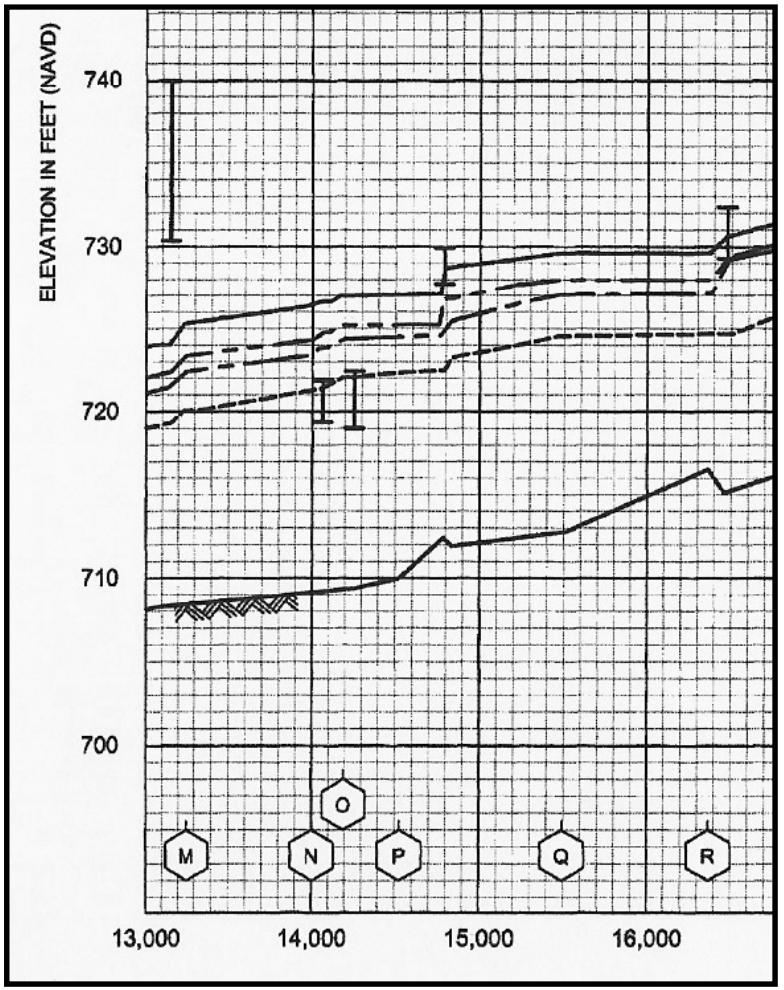

BFE KNOWN

# Problem 2 (cont.)

- Given:
  - FIRM Index Date = FIRM Panel Date
  - Town of Floodville
  - Vertical Datum Used = 1988 (FIRM & BM)
  - BM PID = SC2234
  - Finished Construction
  - Garage is 20’ by 24’
  - Flood Insurance Risk Zone = AE
  - Not Located Within a Protected Area
  - Structure is Located 150 feet Upstream of Cross-Section “M”

# Problem 2 (cont.)

- Stream Profile
  - Horizontal Minor Grid Square = 100 ft
  - Vertical Minor Grid Square = 1 ft



# Problem 2 (cont.)

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) No. 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) No. 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 (Describe) _____

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

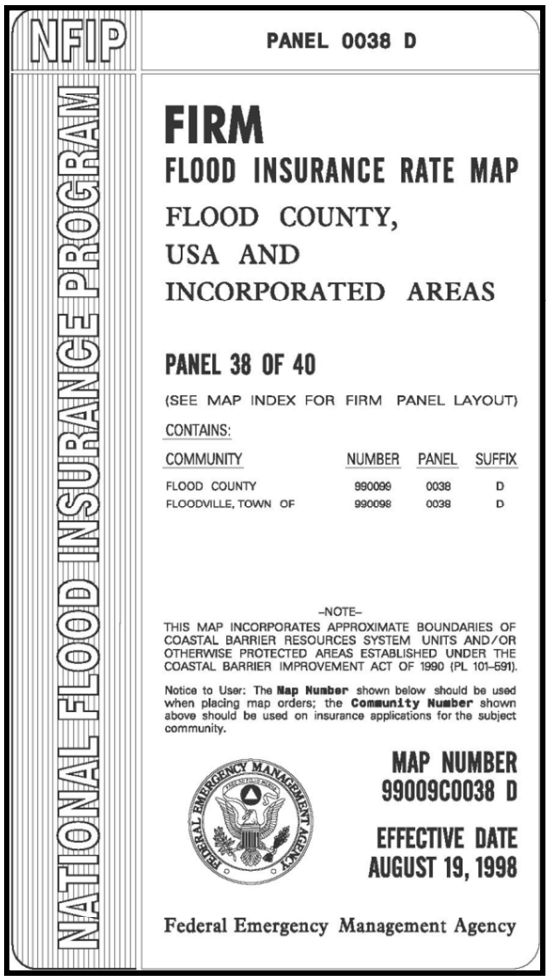
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized _____ Vertical Datum _____

Conversion/Comments _____

| | | Check the measurement used. | |
|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |

# Problem 3



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
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| FLOODVILLE, TOWN OF | 990098 | 0038 | D |

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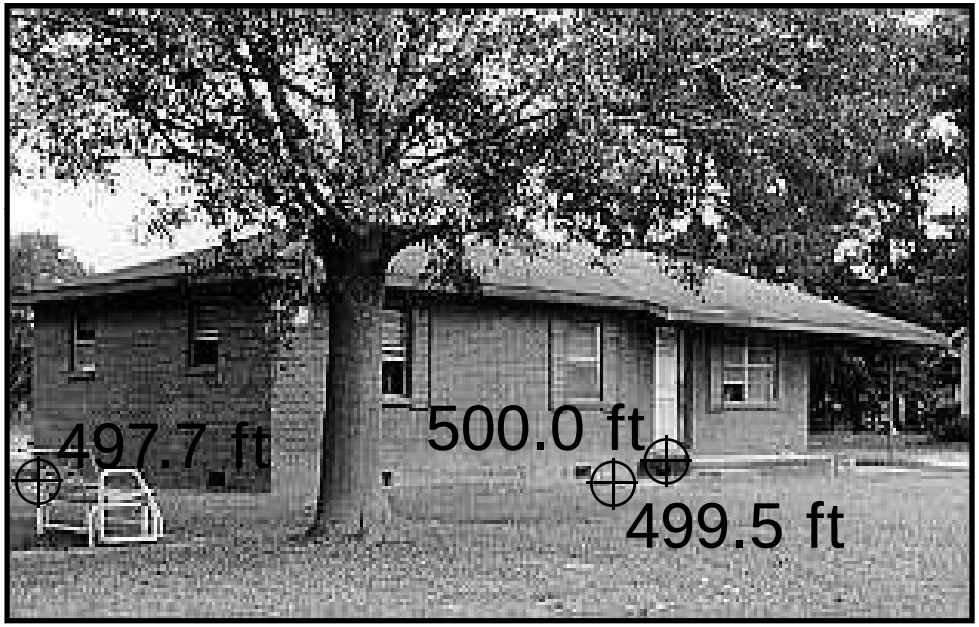
Federal Emergency Management Agency




BFE DETERMINED BY COMMUNITY

# Problem 3 (cont.)

- Given:
  - Community Determined BFE = 499.7 ft
  - FIRM Index Date = FIRM Panel Date
  - Flood County, Finished Construction
  - BM PID = DD4533, NAVD88
  - Flood Insurance Risk Zone = A
  - Not Located Within a Protected Area
  - Crawl Space Elev. = 497.8 ft
  - Enclosure is 20’ by 40’
  - 4 - (20” by 10”) Openings

# Problem 3 (cont.)

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) No. 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) No. 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 (Describe) _____

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

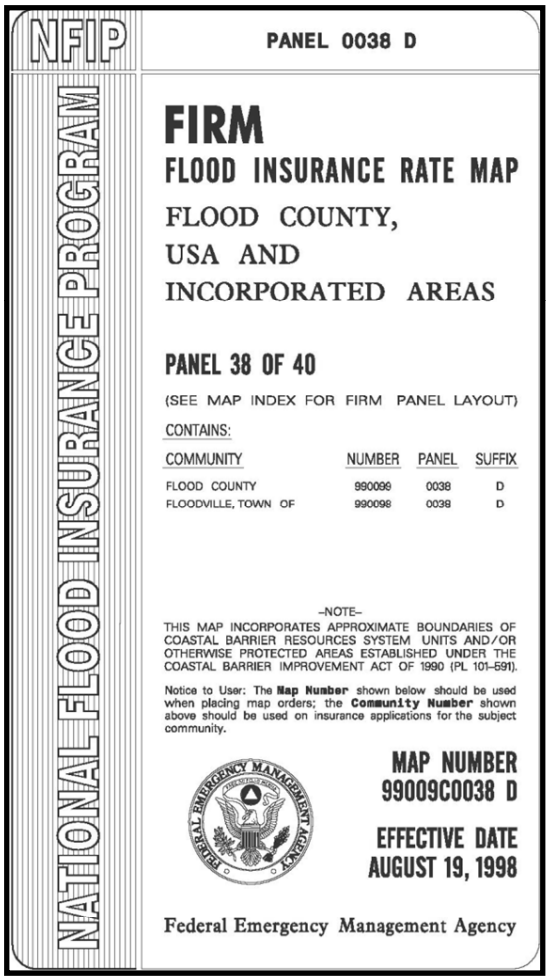
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized _____ Vertical Datum _____

Conversion/Comments _____

| | | Check the measurement used. | |
|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support _____.____ | ☐ feet | ☐ meters (Puerto Rico only) |

# Problem 4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PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
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**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

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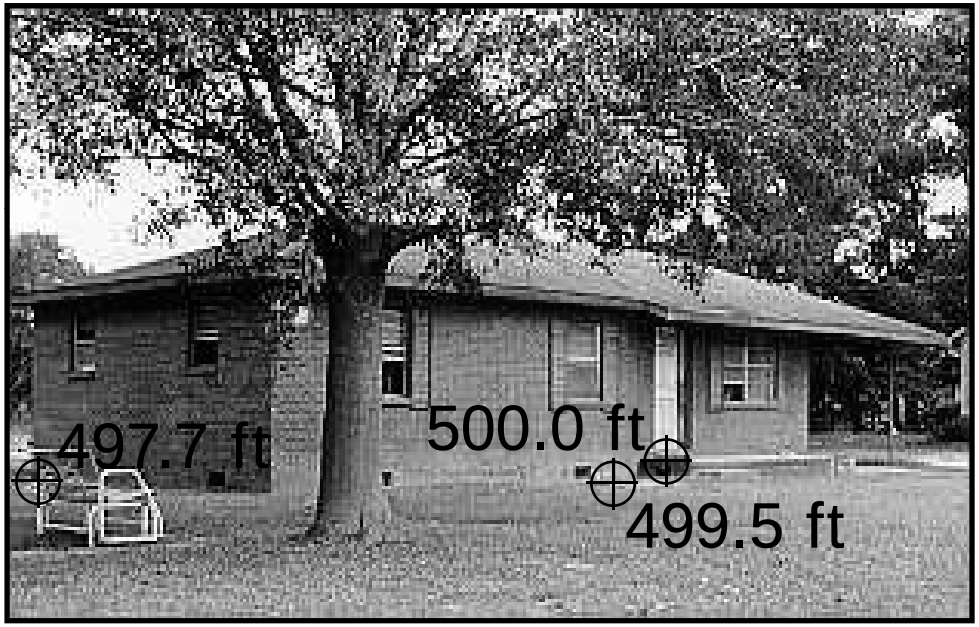
Federal Emergency Management Agency




Given: No BFE
*Determined*

# Problem 4 (cont.)

- Given:
  - No BFE

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) No. 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) No. 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 (Describe) _____

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

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

# Problem 4 (cont.)

- Crawl Space = 497.8 ft, HAG = 499.5 ft

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

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

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6-9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 8-9 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ . ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is _____. _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

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

Property Owner's or Owner's Authorized Representative's Name

Address | City | State | ZIP Code

Signature | Date | Telephone

Comments

☐ Check here if attachments

## Rating Comparison

- For Problem #3 (Determined BFE):
  - Rating Would be Based on C2.b (+0.3')
  - Approx. Insurance Cost $1.05 per $100
- For Problem #4 (Existing Grades):
  - Rating Would be Based on E2 (+0.5')
  - Approx. Insurance Cost $2.07 per $100

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## Additional Information

## Additional Information

- Tutorials can be accessed at FEMA's homepage, www.fema.gov, and then typing in "tutorials" in the search engine.
  - FEMA's search engine is very good, and if any of the links provided in this workshop are not available, just type in the key words for that topic, and a majority of the time it will find the link
- A Web Based Elev. Certificate Tutorial can be Accessed at: http://training.nfipstat.com/ecsurveyor

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## Additional Information (cont.)

- To Obtain Current NFIP Documents, Contact the Map Service Center through the Internet at: http://msc.fema.gov
- Telephone Assistance in Completing Letter of Map Amendments (LOMA) and Letter of Map Revisions – Based on Fill (LOMR-F) can be obtained by calling 877-FEMA-MAP (877-336-2627).

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# Additional Information (cont.)

- Other useful websites:
  - Mapping Information Platform (MIP): https://hazards.fema.gov/femaportal/wps/portal
  - Letter of Map Change Status: www.fema.gov/plan/prevent/fhm/st_main.shtm
  - Engineers and Surveyors: www.fema.gov/plan/prevent/fhm/en_main.shtm
  - All NFIP Forms "Homepage" (Elev. Cert., Floodproofing Cert., MT forms, etc.) www.fema.gov/plan/prevent/fhm/frm_form.shtm

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# Questions & Answers

**Thank You Very Much!!!**

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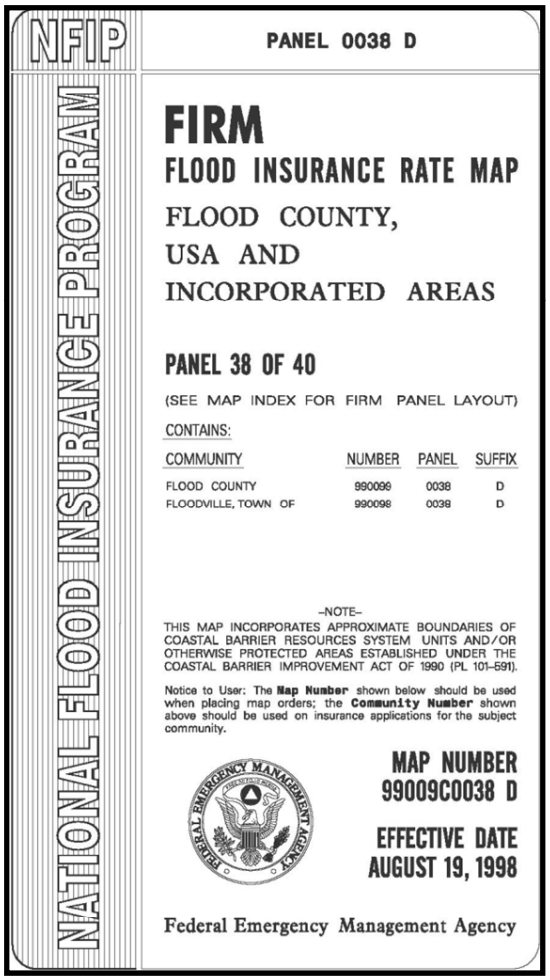
# Problem 1 - Solution



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| FLOOD COUNTY | 990099 | 0038 | D |
| FLOODVILLE, TOWN OF | 990098 | 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

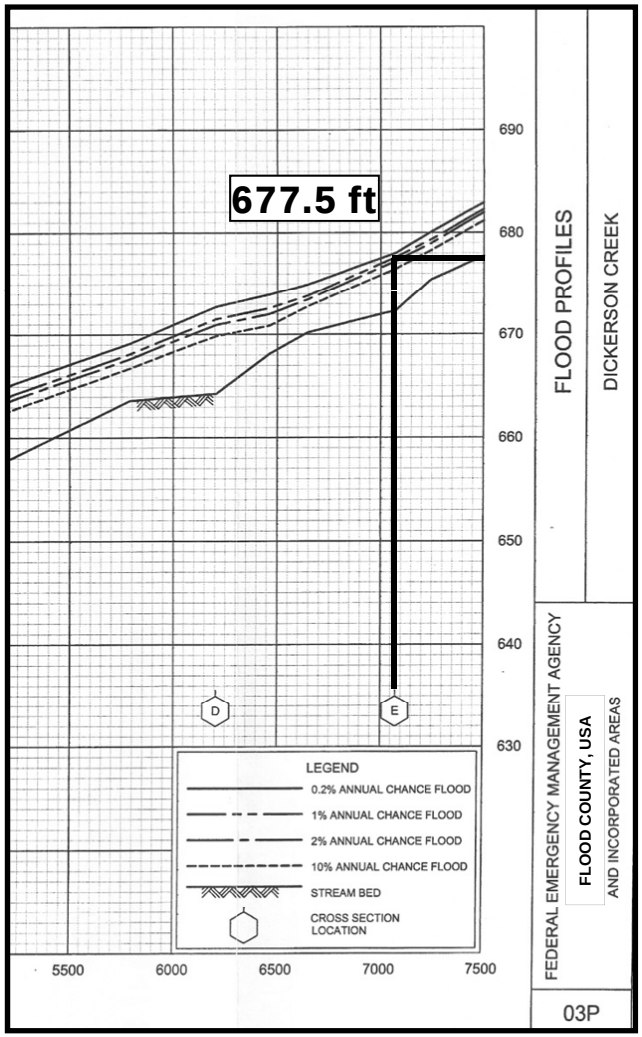

BFE KNOWN

# Problem 1 – Solution (cont.)

- Given:
  - FIRM Index Date = FIRM Panel Date
  - Flood County, USA
  - Vertical Datum Used = 1988 (FIRM & BM)
  - BM PID = AB1098
  - Finished Construction
  - Flood Insurance Risk Zone = AE
  - Not Located Within a Protected Area
  - Structure is Located at X-Section “E”
  - No External Servicing Machinery

# Problem 1 - Solution (cont.)

- Stream Profile
  - Horizontal Minor Grid Square = 50 ft
  - Vertical Minor Grid Square = 1 ft



# Problem 1 - Solution (cont.)

- Floodway Data Table

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE-FLOOD WSEL | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| DICKERSON CREEK | | | | | | | | |
| A | 1,655 | 176 | 913 | 2.7 | 646.6 | 646.6 | 647.3 | 0.7 |
| B | 3,088 | 24 | 150 | 7.8 | 651.0 | 651.0 | 651.4 | 0.4 |
| C | 4,610 | 36 | 206 | 5.6 | 659.6 | 659.6 | 660.2 | 0.6 |
| D | 6,206 | 27 | 165 | 7.0 | 671.5 | 671.5 | 671.8 | 0.3 |
| E | 7,073 | 30 | 144 | 8.1 | 677.6 | 677.6 | 678.1 | 0.5 |
| F | 7,941 | 45 | 185 | 6.3 | 685.4 | 685.4 | 685.5 | 0.1 |
| G | 8,920 | 46 | 159 | 7.3 | 690.9 | 690.9 | 691.0 | 0.1 |
| H | 10,794 | 39 | 126 | 5.7 | 712.8 | 712.8 | 712.8 | 0.0 |
| I | 11,652 | 34 | 74 | 8.4 | 723.4 | 723.4 | 723.4 | 0.0 |

**BFE = 677.6 ft**

[1]Feet above Binder Lake Dam

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

**FLOOD COUNTY, USA**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**DICKERSON CREEK**

# Problem 1 - Solution (cont.)

A7. Building Diagram Number **1A – (Slab-on-Grade without Attached Garage)**

A8. For a building with a crawlspace or enclosure(s):
- a) Square footage of crawlspace or enclosure(s) **-NA-** sq ft
- b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade **-NA-**
- c) Total net area of flood openings in A8.b **-NA-** sq in
- d) Engineered flood openings? ☐ Yes ☒ No

A9. For a building with an attached garage:
- a) Square footage of attached garage **-NA-** sq ft
- b) No. of permanent flood openings in the attached garage within 1.0 foot above adjacent grade **-NA-**
- c) Total net area of flood openings in A9.b **-NA-** 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 |
|---|---|---|
| **Flood County, CID# 990099** | **Flood** | **USA** |

| 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) |
|---|---|---|---|---|---|
| **99009C0038** | **D** | **08/19/98** | **08/19/98** | **AE** | **677.6 Ft** |

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.
☐ FIS Profile ☐ FIRM ☐ Community Determined ☒ Other (Describe) **FIS Floodway Data Table**

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

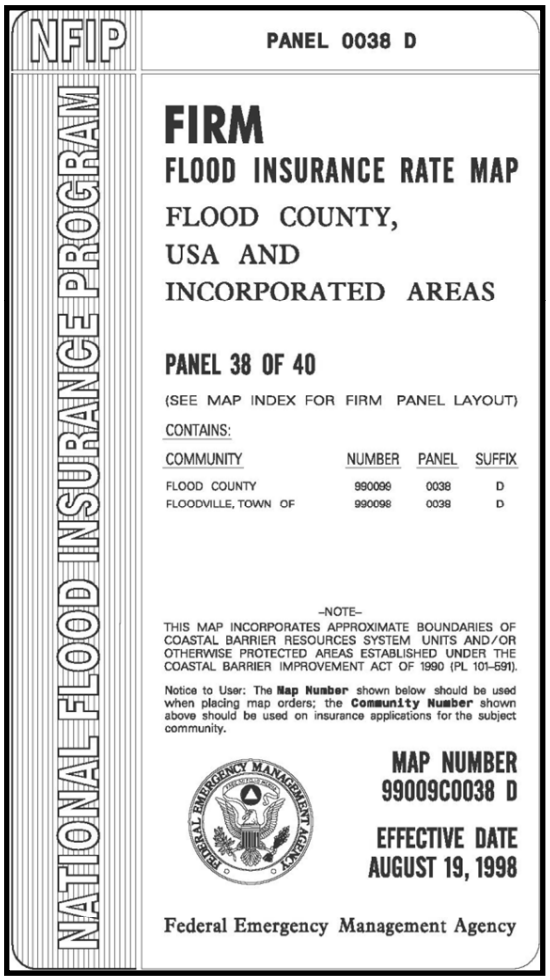
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized **AB1098** Vertical Datum **NAVD88**

Conversion/Comments **-NA-**

| | | | Check the measurement used. | |
|---|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) | **678.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | **678.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) | **677.4** | ☒ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) | **677.8** | ☒ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |

# Problem 2 - Solution


NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| FLOOD COUNTY | 990099 | 0038 | D |
| FLOODVILLE, TOWN OF | 990098 | 0038 | D |

–NOTE–

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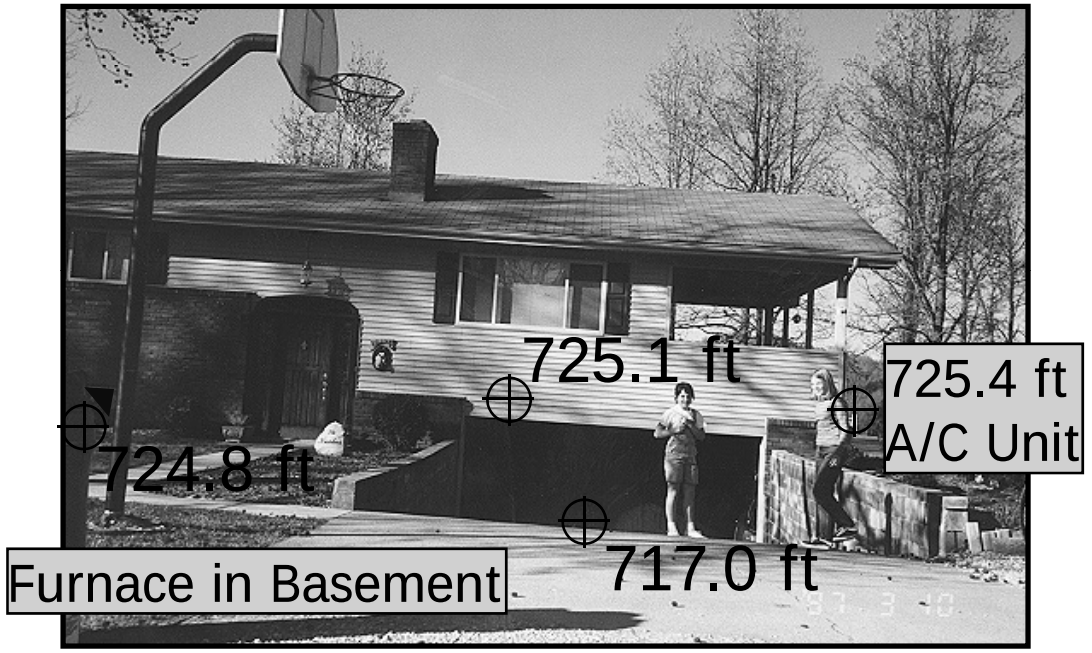
**MAP NUMBER**
**99009C0038 D**

**EFFECTIVE DATE**
**AUGUST 19, 1998**

Federal Emergency Management Agency



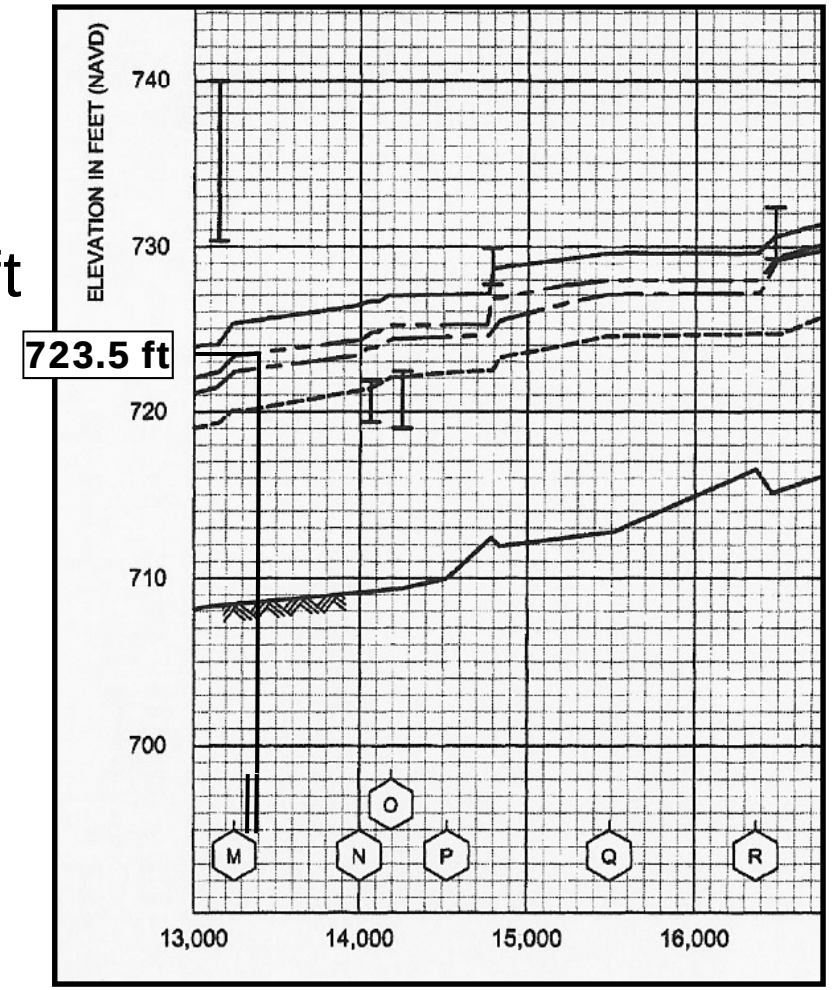

BFE KNOWN

# Problem 2 - Solution (cont.)

- Given:
  - FIRM Index Date = FIRM Panel Date
  - Town of Floodville
  - Vertical Datum Used = 1988 (FIRM & BM)
  - BM PID = SC2234
  - Finished Construction
  - Garage is 20’ by 24’
  - Flood Insurance Risk Zone = AE
  - Not Located Within a Protected Area
  - Structure is Located 150 feet Upstream of Cross-Section “M”

# Problem 2 - Solution (cont.)

- Stream Profile
  - Horizontal Minor Grid Square = 100 ft
  - Vertical Minor Grid Square = 1 ft



# Problem 2 - Solution (cont.)

A7. Building Diagram Number **2 - (Basement Foundation with Attached Garage)**

A8. For a building with a crawlspace or enclosure(s):
- a) Square footage of crawlspace or enclosure(s): **-NA-** sq ft
- b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade: **-NA-**
- c) Total net area of flood openings in A8.b: **-NA-** sq in
- d) Engineered flood openings? ☐ Yes ☒ No

A9. For a building with an attached garage:
- a) Square footage of attached garage: **480** sq ft
- b) No. of permanent flood openings in the attached garage within 1.0 foot above adjacent grade: **0**
- c) Total net area of flood openings in A9.b: **0** 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 |
|---|---|---|
| **Town of Floodville, CID# 990098** | **Flood** | **USA** |

| 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) |
|---|---|---|---|---|---|
| **99009C0038** | **D** | **08/19/98** | **08/19/98** | **AE** | **723.5 ft** |

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.
☒ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other (Describe) _____

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

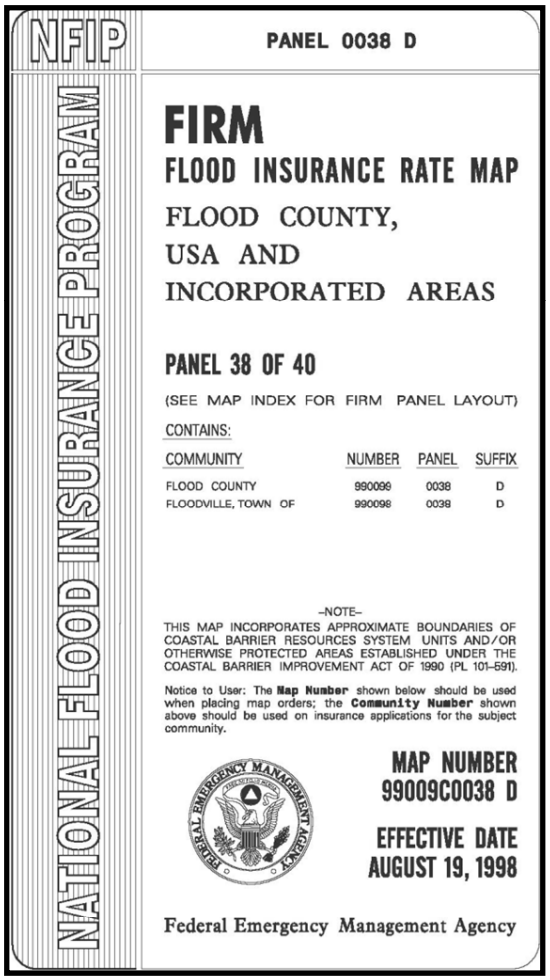
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized **SC2234** Vertical Datum **NAVD88**

Conversion/Comments **-NA-**

| | | | Check the measurement used. | |
|---|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) | **717.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor | **725.1** | ☒ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) | **717.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | **717.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) | **717.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) | **724.8** | ☒ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |

# Problem 3 - Solution



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| FLOOD COUNTY | 990099 | 0038 | D |
| FLOODVILLE, TOWN OF | 990098 | 0038 | D |

–NOTE–

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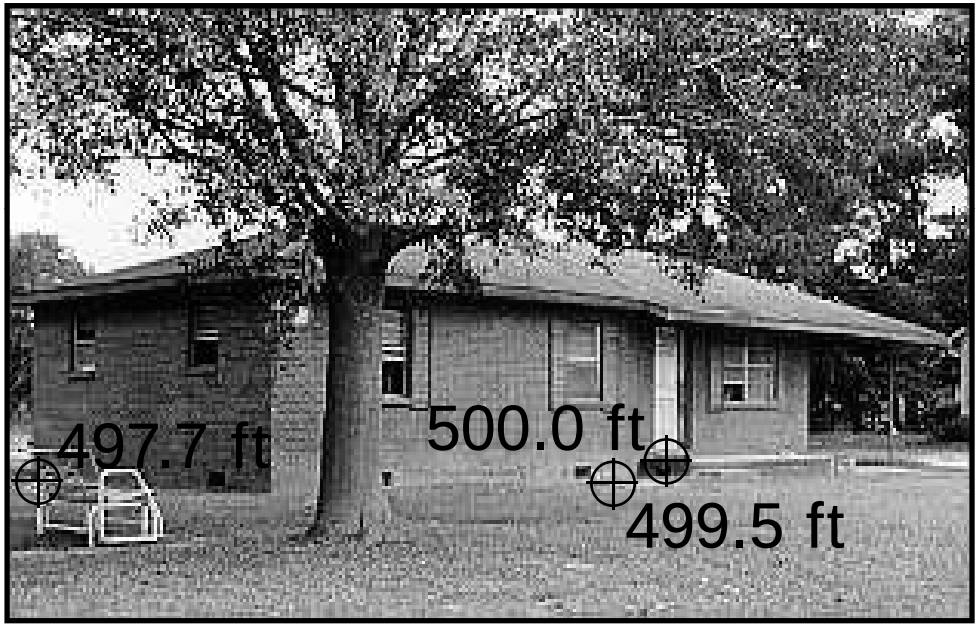
**99009C0038 D**

**EFFECTIVE DATE**
**AUGUST 19, 1998**

Federal Emergency Management Agency




BFE DETERMINED BY COMMUNITY

# Problem 3 - Solution (cont.)

- Given:
  - Community Determined BFE = 499.7 ft
  - FIRM Index Date = FIRM Panel Date
  - Flood County, Finished Construction
  - BM PID = DD4533, NAVD88
  - Flood Insurance Risk Zone = A
  - Not Located Within a Protected Area
  - Crawl Space Elev. = 497.8 ft
  - Enclosure is 20’ by 40’
  - 4 - (20” by 10”) Openings

# Problem 3 - Solution (cont.)

A7. Building Diagram Number **8 – (Crawl Space without Attached Garage)**

A8. For a building with a crawlspace or enclosure(s):
- a) Square footage of crawlspace or enclosure(s): **800** sq ft
- b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade: **4**
- c) Total net area of flood openings in A8.b: **800** sq in
- d) Engineered flood openings? ☐ Yes ☒ No

A9. For a building with an attached garage:
- a) Square footage of attached garage: **-NA-** sq ft
- b) No. of permanent flood openings in the attached garage within 1.0 foot above adjacent grade: **-NA-**
- c) Total net area of flood openings in A9.b: **-NA-** 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 |
|---|---|---|
| **Flood County, CID# 990099** | **Flood** | **USA** |

| 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) |
|---|---|---|---|---|---|
| **99009C0038** | **D** | **08/19/98** | **08/19/98** | **A** | **499.7 ft** |

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe) _____

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

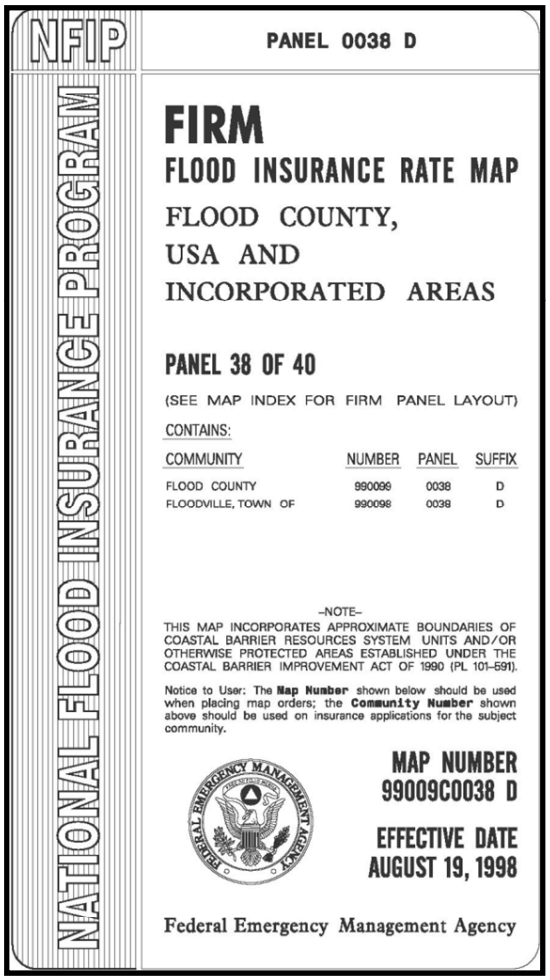
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. Use the same datum as the BFE.

Benchmark Utilized **DD4533** Vertical Datum **NAVD88**

Conversion/Comments **-NA-**

| | | | Check the measurement used. | |
|---|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) | **497.8** | ☒ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor | **500.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) | **500.0** | ☒ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) | **497.7** | ☒ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) | **499.5** | ☒ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | **-NA-** | ☐ feet | ☐ meters (Puerto Rico only) |

# Problem 4 - Solution



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038 D

**FIRM**

**FLOOD INSURANCE RATE MAP**

FLOOD COUNTY,
USA AND
INCORPORATED AREAS

**PANEL 38 OF 40**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| FLOOD COUNTY | 990099 | 0038 | D |
| FLOODVILLE, TOWN OF | 990098 | 0038 | D |

–NOTE–

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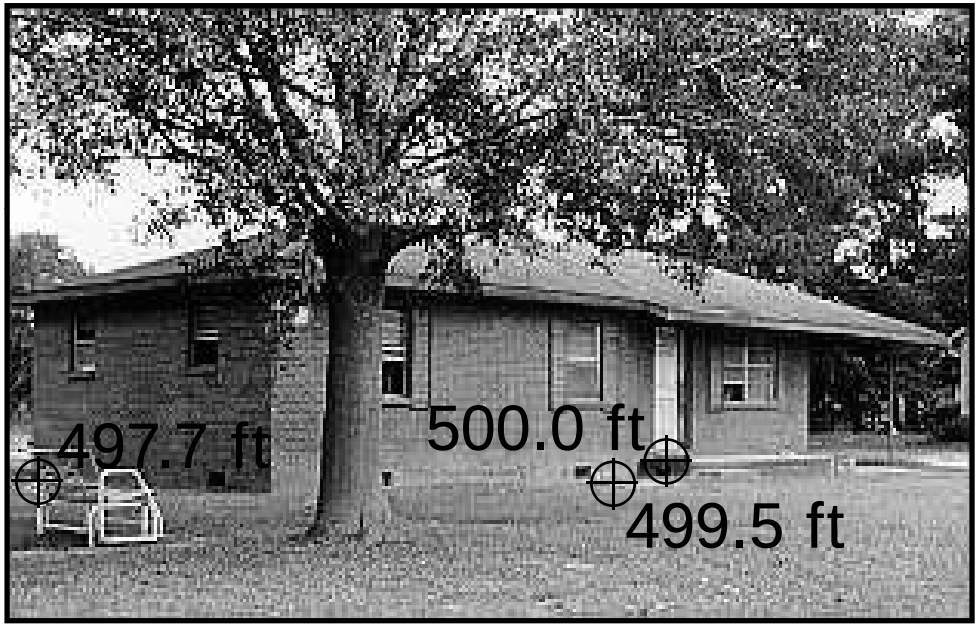
**AUGUST 19, 1998**

Federal Emergency Management Agency




Given: No BFE
*Determined*

# Problem 4 - Solution (cont.)

- Given:
  - No BFE

A7. Building Diagram Number **8 – (Crawl Space without Attached Garage)**

A8. For a building with a crawlspace or enclosure(s):
- a) Square footage of crawlspace or enclosure(s) **800** sq ft
- b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade **4**
- c) Total net area of flood openings in A8.b **800** sq in
- d) Engineered flood openings? ☐ Yes ☒ No

A9. For a building with an attached garage:
- a) Square footage of attached garage **-NA-** sq ft
- b) No. of permanent flood openings in the attached garage within 1.0 foot above adjacent grade **-NA-**
- c) Total net area of flood openings in A9.b **-NA-** 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 |
|---|---|---|
| **Flood County, CID# 990099** | **Flood** | **USA** |

| 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) |
|---|---|---|---|---|---|
| **99009C0038** | **D** | **08/19/98** | **08/19/98** | **A** | **Unavailable** |

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.
☐ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other (Describe) _____

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

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

# Problem 4 - Solution (cont.)

- Crawl Space = 497.8 ft, HAG = 499.5 ft

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

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

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
a) Top of bottom floor (including basement, crawlspace, or enclosure) is **1.7** ☒ feet ☐ meters ☐ above or ☒ below the HAG.
b) Top of bottom floor (including basement, crawlspace, or enclosure) is **0.1** ☒ 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 8-9 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is **0.5** ☒ feet ☐ meters ☒ above or ☐ below the HAG.

E3. Attached garage (top of slab) is **-NA-** ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is **0.5** ☒ feet ☐ meters ☒ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

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

Property Owner's or Owner's Authorized Representative's Name

Address | City | State | ZIP Code

Signature | Date | Telephone

Comments **Measurements in Section E were based upon finished grades.**

☐ Check here if attachments

FEMA

*NATIONAL FLOOD INSURANCE PROGRAM*

# ELEVATION CERTIFICATE

**AND**

**INSTRUCTIONS**

# NATIONAL FLOOD INSURANCE PROGRAM
# ELEVATION CERTIFICATE

## 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 20472, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

## PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate Post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for Pre-FIRM buildings unless the building is being rated under the optional Post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance that specifies minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in FEMA Publication 467-1, Floodplain Management Bulletin: Elevation Certificate, available on FEMA's website at http://www.fema.gov/library/viewRecord.do?id=1727.

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

# ELEVATION CERTIFICATE

OMB No. 1660-0008
Expires March 31, 2012

Important: Read the instructions on pages 1-9.

## 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) No. 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) No. 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 (Describe) _____

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

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

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

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

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

Benchmark Utilized _____ Vertical Datum_____

Conversion/Comments _____

| | | Check the measurement used. | |
|---|---|---|---|
| a) | Top of bottom floor (including basement, crawlspace, or enclosure floor) _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| b) | Top of the next higher floor _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| c) | Bottom of the lowest horizontal structural member (V Zones only) _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| d) | Attached garage (top of slab) _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| e) | Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments) _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| f) | Lowest adjacent (finished) grade next to building (LAG) _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| g) | Highest adjacent (finished) grade next to building (HAG) _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |
| h) | Lowest adjacent grade at lowest elevation of deck or stairs, including structural support _____.___ | ☐ feet | ☐ meters (Puerto Rico only) |

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

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

☐ Check here if comments are provided on back of form. Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No

PLACE SEAL HERE

Certifier's Name — License Number

Title — Company Name

Address — City — State — ZIP Code

Signature — Date — Telephone

| IMPORTANT: In these spaces, copy the corresponding information from Section A. | | | For Insurance Company Use: |
|---|---|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | | Policy Number |
| City | State | ZIP Code | Company NAIC Number |

## SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

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

Comments

Signature Date

☐ Check here if attachments

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

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

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6-9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 8-9 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ . ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

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

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

Property Owner's or Owner's Authorized Representative's Name

Address City State ZIP Code

Signature Date Telephone

Comments

☐ Check here if attachments

## SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8 and G9.

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

| G4. Permit Number | G5. Date Permit Issued | G6. Date Certificate Of Compliance/Occupancy Issued |
|---|---|---|
| | | |

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

G8. Elevation of as-built lowest floor (including basement) of the building _____. ____ ☐ feet ☐ meters (PR) Datum_____

G9. BFE or (in Zone AO) depth of flooding at the building site _____. ____ ☐ feet ☐ meters (PR) Datum_____

G10. Community's design flood elevation _____. ____ ☐ feet ☐ meters (PR) Datum_____

Local Official's Name Title

Community Name Telephone

Signature Date

Comments

☐ Check here if attachments

# Building Photographs

See Instructions for Item A6.

| | For Insurance Company Use: |
|---|---|
| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | Policy Number |
| City State ZIP Code | Company NAIC Number |

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page on the reverse.

# Building Photographs

Continuation Page

| Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | | | For Insurance Company Use: Policy Number |
|---|---|---|---|
| City | State | ZIP Code | Company NAIC Number |

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."

# INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

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

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

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

## 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, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

**Item A5.** Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. When the latitude and longitude are provided by a surveyor, check the "Yes" box in Section D and indicate the method used to determine the latitude and longitude in the Comments area of Section D. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

**Item A6.** If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least two photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. To the extent possible, these photographs should show the entire building including foundation. If the building has split-level or multi-level areas, provide at least two additional photographs showing side views of the building. In addition, when applicable, provide a photograph of the foundation showing a representative example of the flood openings or vents. All photographs must be in color and measure at least 3"x3". Digital photographs are acceptable.

**Item A7.** Select the diagram on pages 7-9 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a-h. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

**Item A8.a** Provide the square footage of the crawlspace or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawlspace or enclosure(s). Examples of elevated buildings constructed with crawlspace and enclosure(s) are shown in Diagrams 6-9 on pages 8-9. Diagram 2, 4, or 9 should be used for a building constructed with a crawlspace floor that is below the exterior grade on all sides.

**Items A8.b-d** Enter in Item A8.b the number of permanent flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. Indicate in Item A8.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the crawlspace or enclosure(s) have no permanent openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

**Item A9.a** Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

**Items A9.b-d** Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover than exists in the flood openings. Indicate in Item A9.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the garage has no permanent flood openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A9.b-c.

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

Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building's location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community's FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the new county in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

If the map in effect at the time of the building's construction was other than the current FIRM, and you have the past map information pertaining to the building, provide the information in the Comments area of Section D.

**Item B1.** NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA's web site at http://www.fema.gov/fema/csb.shtm, or call 1-800-358-9616.

**Item B2.** County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter "unincorporated area." For an independent city, enter "independent city."

**Item B3**. State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

**Items B4-B5.** Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a 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 map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

**Item B8.** Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1-A30, V, VE, V1-V30, AH, AO, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

**Item B9.** Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1-A30, AE, AH, V1-V30, VE, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Item B10.** Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

**Item B11.** Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

**Item B12.** Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. Information about CBRS areas and OPAs may be obtained on the FEMA web site at http://www.fema.gov/business/nfip/cbrs/cbrs.shtm.

## 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 AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawlspaces to shoot the elevation of the crawlspace floor. If access to the crawlspace is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawlspace to the "next higher floor," and then subtract the crawlspace height from the elevation of the "next higher floor." If there is no access to the crawlspace, use the exterior grade next to the structure to measure the height of the crawlspace to the "next higher floor."
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawlspace floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawlspace floor to the next higher floor, try to verify this by looking inside the crawlspace through any openings or vents.

In all three cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

**Item C1.** Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be

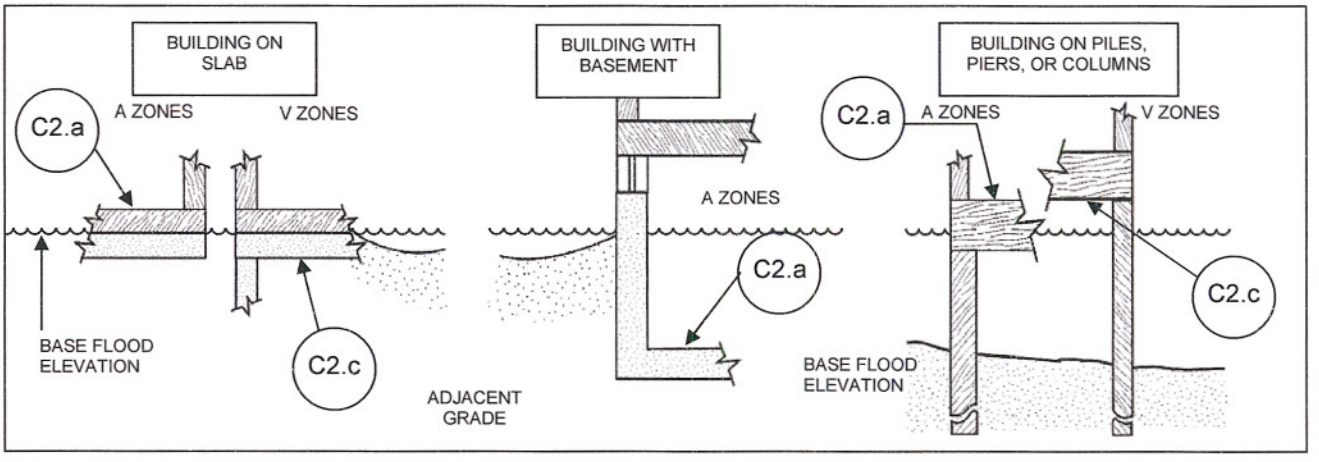
required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a-h. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

**Item C2.** A field survey is required for Items C2.a-h. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other unique identifier assigned by the maintainer of the benchmark. For GPS survey, indicate the benchmark used for the base station, the Continuously Operating Reference Stations (CORS) sites used for an On-line Positioning User Service (OPUS) solution (also attach the OPUS report), or the name of the Real Time Network used.

Also provide the vertical datum for the benchmark elevation. All elevations for the certificate, including the elevations for Items C2.a-h, must use the same datum on which the BFE is based. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. Show the datum conversion, if applicable, in this section or in the Comments area of Section D.

For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a-h to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Items C2.a-d** Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7) in Items C2.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a-h. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawlspace, Diagrams 8 and 9, enter the elevation of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents). *If any item does not apply to the building, enter "N/A" for not applicable.*




**Item C2.e** Enter the lowest platform elevation of at least one of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type and its general location, e.g., on floor inside garage or on platform affixed to exterior wall, in the Comments area of Section D or Section G, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

**Items C2.f-g** Enter the elevation of the ground, sidewalk, or patio slab immediately next to the building. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

**Item C2.h** Enter the lowest grade elevation at the deck support or stairs. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

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

Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, openings, or other relevant information not specified on the front.

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

Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1- E4 is based on the "natural grade."

**Items E1.a and b** Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

**Item E2.** For Building Diagrams 6-9 with permanent flood openings (see pages 8-9), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

**Item E3.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

**Item E4.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter "N/A" for not applicable.*

**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 REPRESENTATIVE) CERTIFICATION

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

## SECTION G - COMMUNITY INFORMATION (OPTIONAL)

Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be

filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/A1-A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3** if the information in Items G4-G10 has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4-G10 provide a way to document these determinations.

**Item G4.** Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

**Item G5.** Date Permit Issued. Enter the date the permit was issued for the building.

**Item G6.** Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

**Item G7.** New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

**Item G8.** As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

**Item G9.** BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

**Item G10.** Community's design flood elevation. Enter the elevation (including freeboard above the BFE) to which the community requires the lowest floor to be elevated. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

## BUILDING DIAGRAMS

The following diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7, the square footage of crawlspace or enclosure(s) and the area of flood openings in square inches in Items A8.a-c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a-c, and the elevations in Items C2.a-h.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).

**DIAGRAM 1A**

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

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

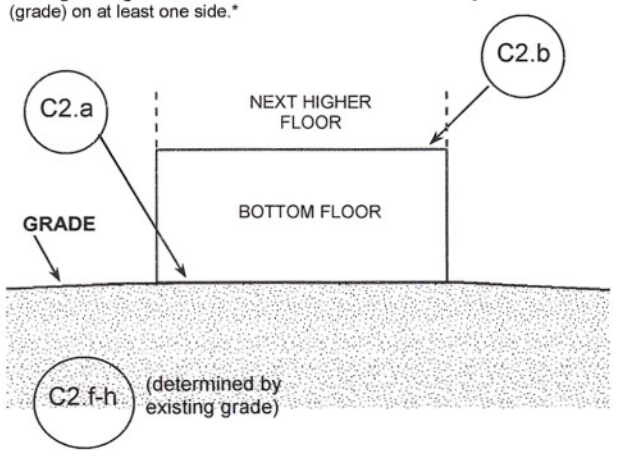



**DIAGRAM 1B**

**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.*

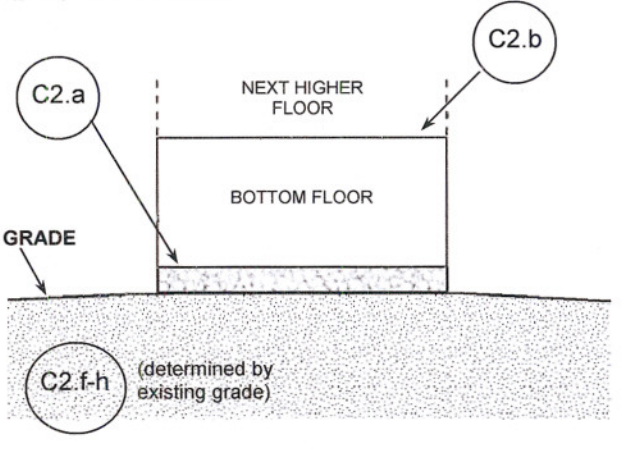
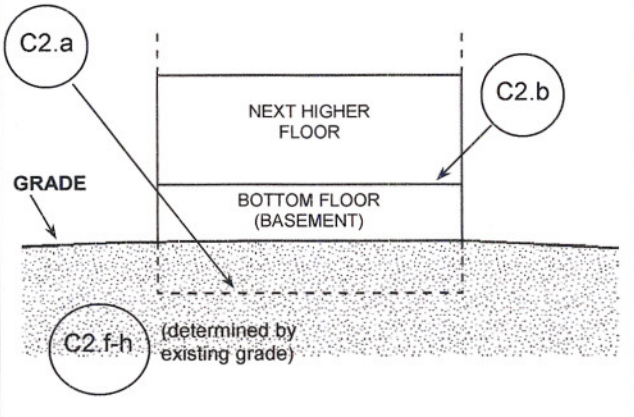



**DIAGRAM 2**

**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.*

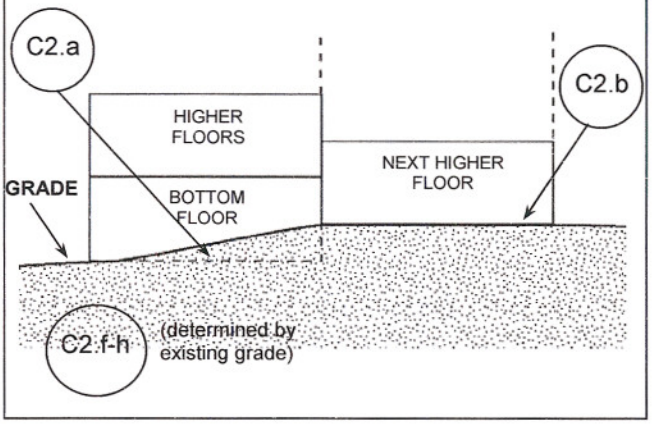



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc

## DIAGRAM 3

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

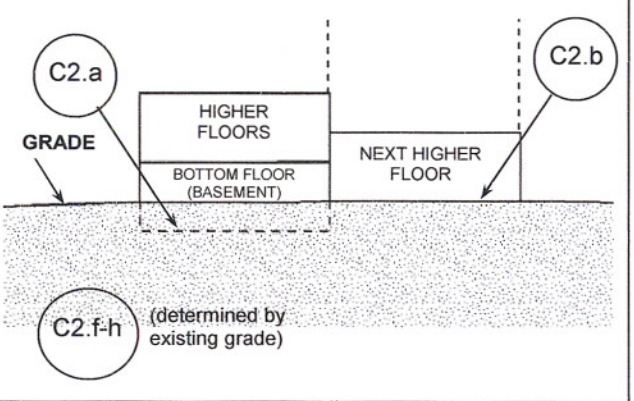
**Distinguishing Feature –** The bottom floor (excluding garage) is at or above ground level (grade) on at least one side.*




## DIAGRAM 4

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

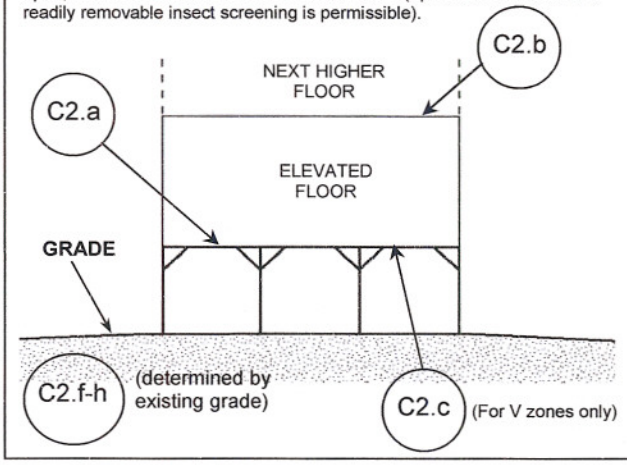
**Distinguishing Feature –** The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*




## DIAGRAM 5

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

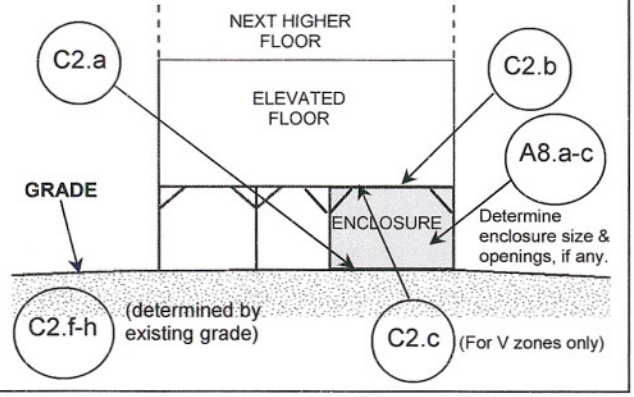
**Distinguishing Feature –** For all zones, the area below the elevated floor is open, with no obstruction to flow of flood waters (open lattice work and/or readily removable insect screening is permissible).




## 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.



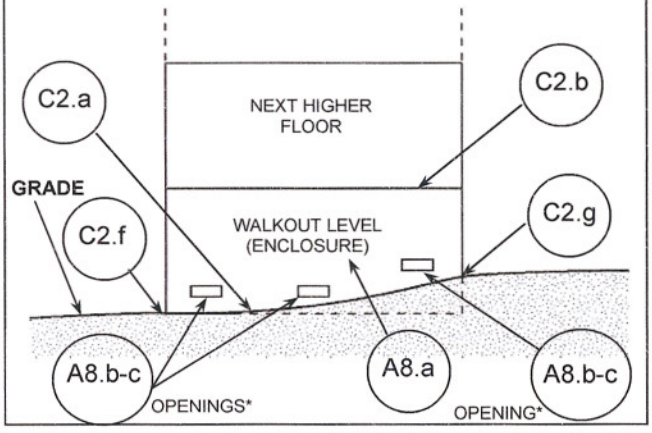

* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

** 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 International Code Council Evaluation Service (ICC ES) must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least 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 one 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.

## 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.**

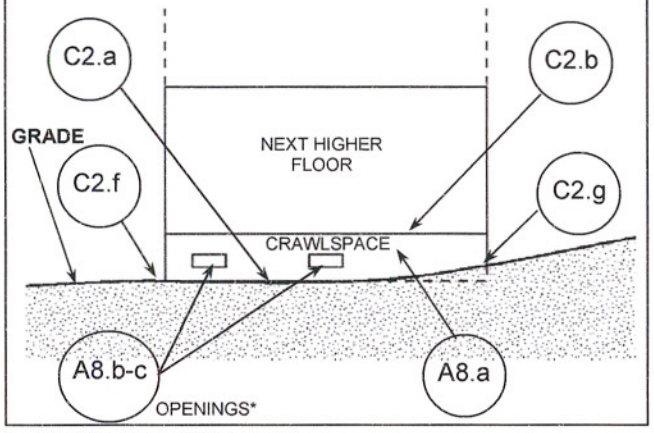
**Distinguishing Feature –** For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings* present in the walls of the enclosure. Indicate information about enclosure size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

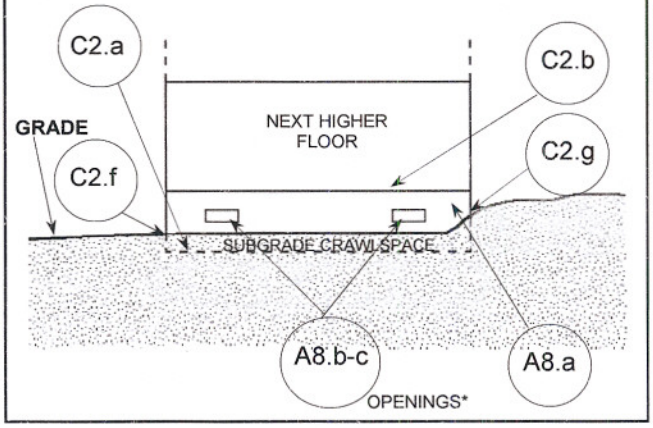
**Distinguishing Feature –** For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings* present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property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




## DIAGRAM 9

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

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




* 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 International Code Council Evaluation Service (ICC ES) must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least 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 one 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.

** 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.