2025
SURVEYORS'
Conference

404 - FEMA Elevation Certificates

Thomas F. Smith, PE, PLS

tfsmith2@gmail.com

JANUARY 12-15, 2025 | HERSHEY, PA

National Flood Insurance Program

FEMA ELEVATION CERTIFICATES

PA Surveyor Training – Presented by Thomas F. Smith, PE, PLS

January 14, 2025

FEMA Region III Mitigation Division

Floodplain Management & Insurance Branch

Developed with support from:
Risk Analysis Branch
Hazard Mitigation Assistance Branch

2023 Forms courtesy of
Pennsylvania Emergency Management Agency

Edited by Thomas F. Smith, PE, PLS
For 2025 Surveyors' Conference

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NATIONAL FLOOD INSURANCE PROGRAM

Objectives

Provide Land Surveyors with high-level information about the National Flood Insurance Program (NFIP), and job-specific details including:

- a broad overview of the components of the NFIP
- mapping tools and resources
- The 2023 Elevation Certificate Update

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NATIONAL FLOOD INSURANCE PROGRAM

Today's Agenda

- **Introduction**
- **FEMA Flood Maps and Insurance Studies**
- **The 2023 Elevation Certificate**
- **Questions**

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NATIONAL FLOOD INSURANCE PROGRAM

Background in the National Flood Insurance Program (NFIP)

INTRODUCTION

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National Flood Insurance Program

- Created by the National Flood Insurance Act of 1968
- Participation is **voluntary**
  - Adopt and enforce regulations
  - Eligible for flood insurance
- **Benefits** of participation:
  - Flood insurance
  - Grants and loans
  - Disaster assistance
  - Federally-backed mortgages

NATIONAL FLOOD INSURANCE PROGRAM

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Legal Basis of the NFIP

- National Flood Insurance Act of 1968 as amended (42 U.S.C 4001-4129)
- NFIP regulations are found at 44 Code of Federal Regulations (CFR) Parts 59-78
- **Goals of the NFIP include:**
  - Save lives and protect property
  - Offer low cost flood insurance
  - Encourage a comprehensive approach to floodplain management

NATIONAL FLOOD INSURANCE PROGRAM

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FLOOD INSURANCE PURCHASE REQUIREMENTS

THE MANDATORY PURCHASE REQUIREMENT

The Flood Disaster Protection Act of 1973 added a key requirement to the NFIP: if a community participates in the program, flood insurance is a prerequisite for receiving money from a federal agency or a federally-supported financial program.

The requirement applies to secured mortgage loans from financial institutions, such as commercial lenders, savings and loan associations, savings banks, and credit unions that are regulated, supervised or insured by Federal agencies such as the Federal Deposit Insurance Corporation and the Office of Thrift Supervision.

The requirement comes into play if a loan is made, increased, renewed or extended – at any of those steps, the lender must check to see if the building is in an SFHA at that time. For example, a building in an X Zone when the original mortgage was taken out, would be affected if the area is remapped in the SFHA and the loan is later refinanced.

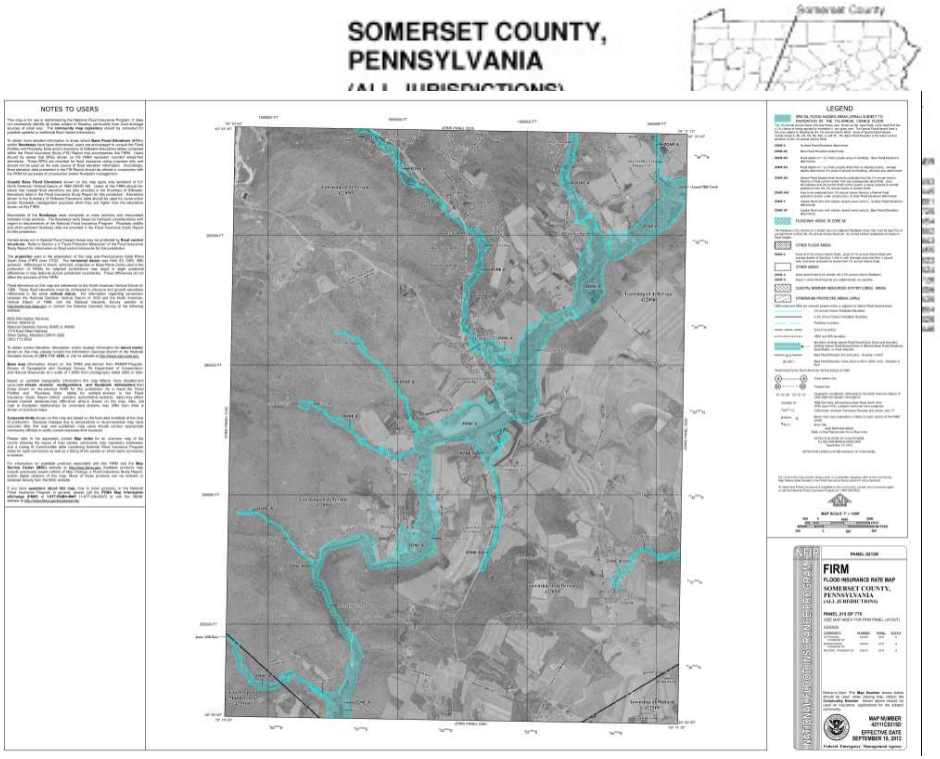
The requirement also applies to all mortgage loans purchased by Fannie Mae or Freddie Mac in the secondary mortgage market.

FEMA FLOOD MAPS & STUDIES

FEMA

Maps and Data

- Flood Insurance Rate Map (FIRM)
- Flood Insurance Study (FIS)
- Community Identified Risk
  - Historic high water marks



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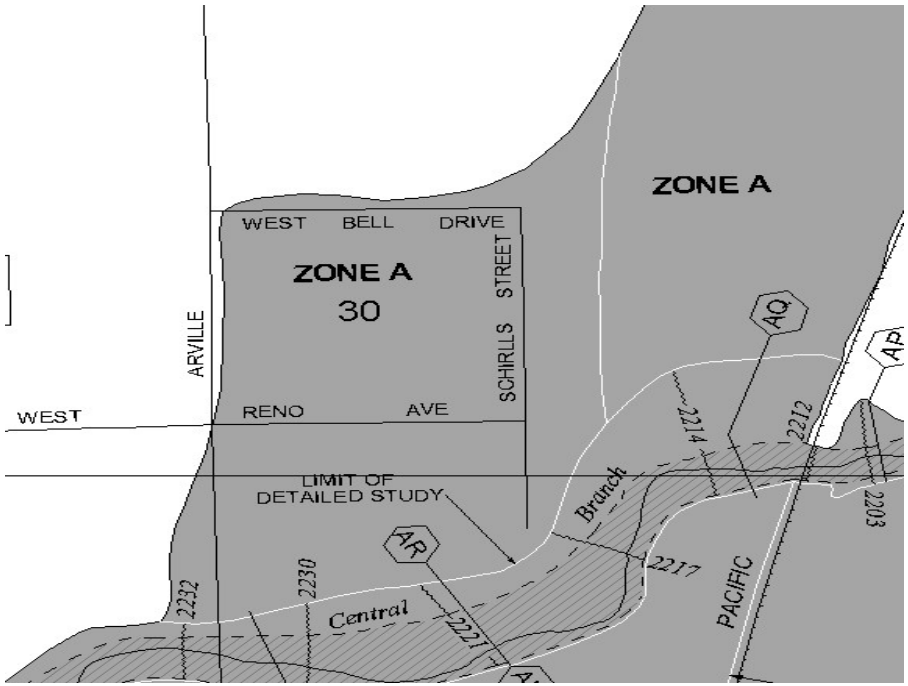
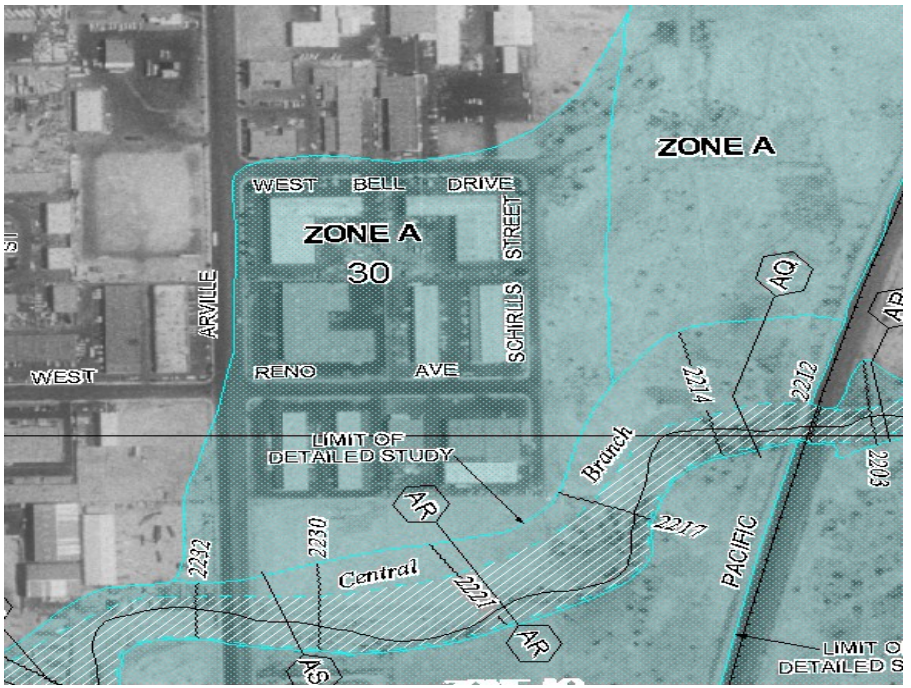
DFIRM Examples

- Region III moving to all digital data

Paper FIRM	Digital FIRM





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Key Definitions

- *Special Flood Hazard Area* – The area on a Flood Insurance Rate Map (FIRM) which is subject to the Base Flood. Also known as the A Zone or V Zone or the Regulatory Floodplain.
- *Base Flood* – The flood having a 1% chance of being equaled or exceeded in any given year.
- *Base Flood Elevation (BFE)* - Height of the 1% annual chance (100 year) flood measured in feet above sea level

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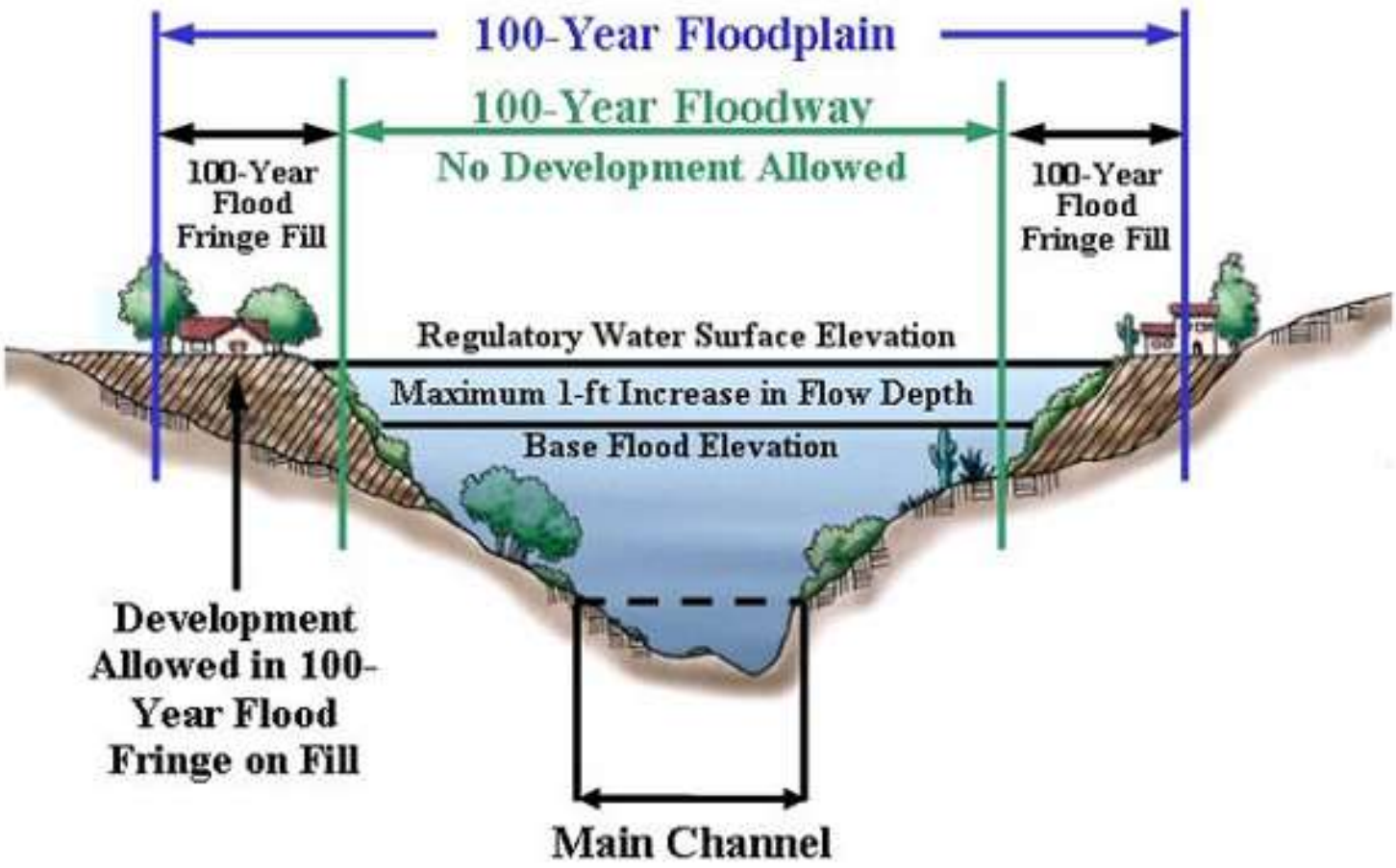
FEMA DEFINITIONS AND LINKS

- FEMA – The Federal Emergency Management Agency
  - The agency part of Homeland Security that is responsible for the Flood Insurance Program. Website: www.fema.gov;
  - FEMA Maps: msc.fema.gov
  - Home study (527 pages) : http://www.fema.gov/pdf/floodplain/is_9_complete.pdf
- Base Flood Elevation (BFE)
  - The computed elevation to which floodwater is anticipated to rise during the base flood. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. Commonly the "One hundred year flood elevation"
- Flood Zones
  - Zone A – Areas subject to inundation by the 1-percent-annual-chance flood ("100-year flood") event generally determined using approximate methodologies. Detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
  - Zone AE - Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
  - Zone X - Moderate risk areas within the 0.2-percent-annual-chance floodplain (500-year), areas of 1-percent-annual-chance (100-year) flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

SFHA Boundaries and Elevations

- BFE - Height of the 1% annual chance (100 year) flood measured in feet above sea level
- Flood profiles in Flood Insurance Studies typically represent BFE for 10, 50, 100, and 500 year floods.



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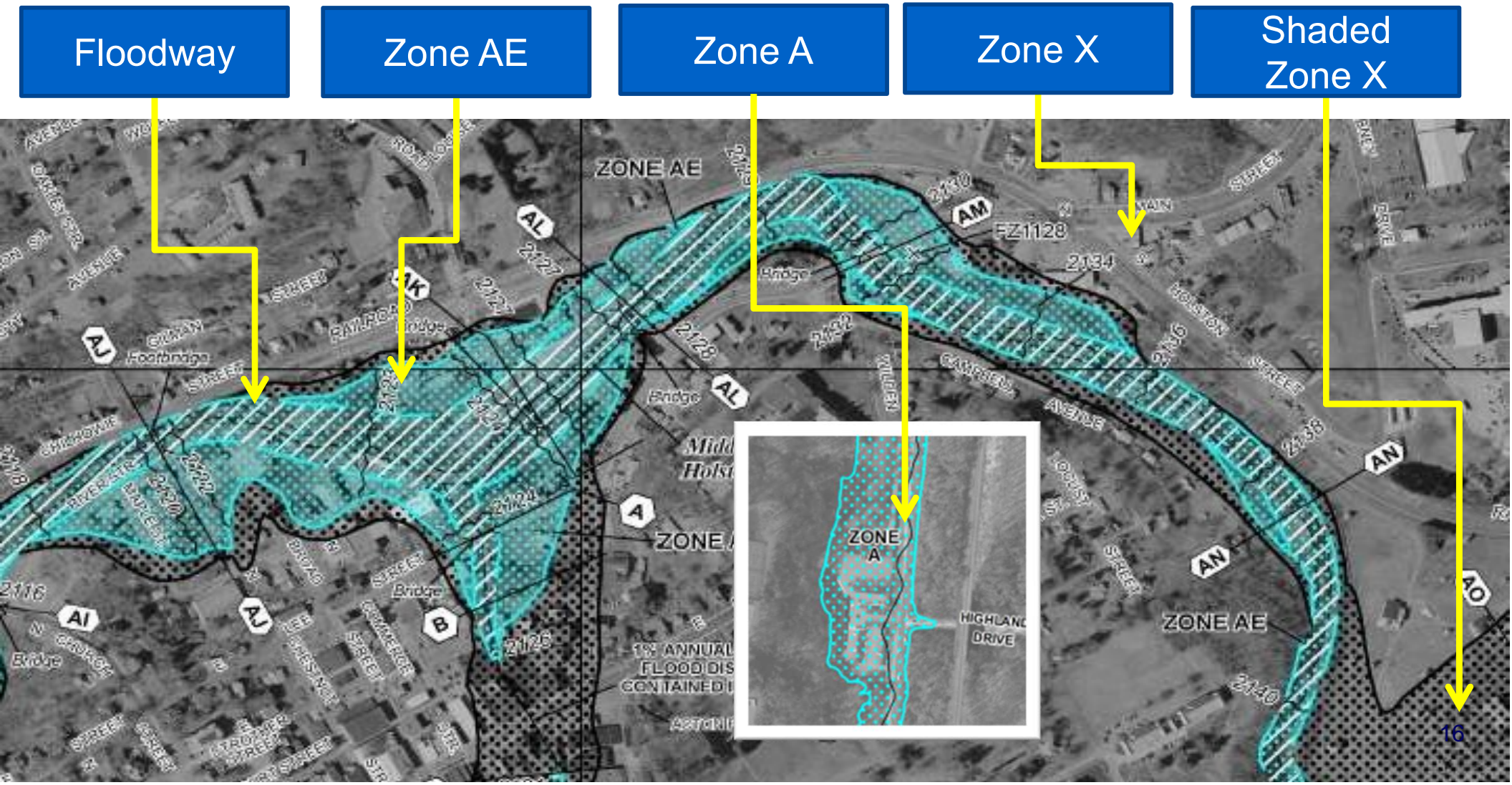
Understanding the FIRM - Riverine

- Insurance implications and regulatory requirements

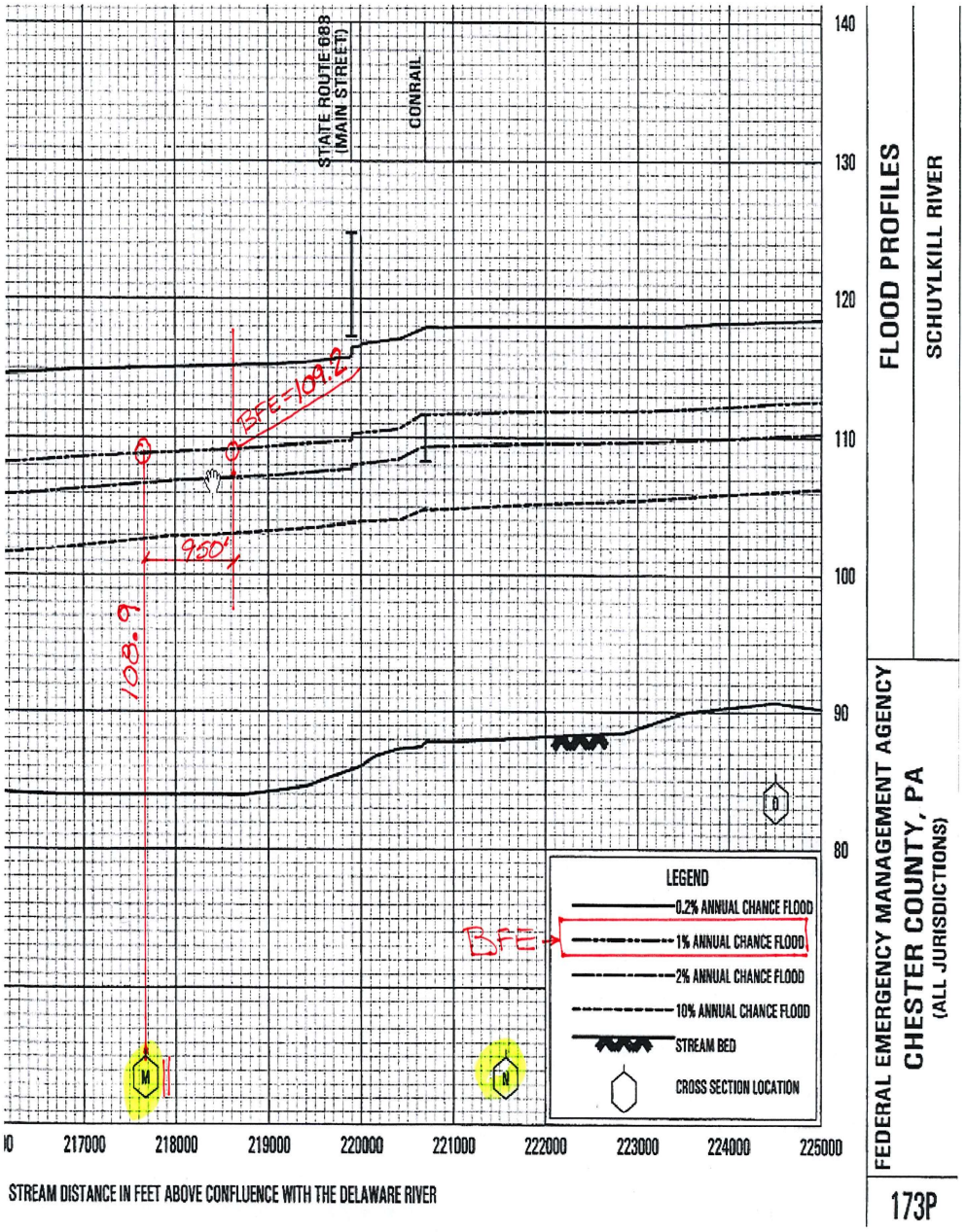


CHANCES OF FLOODING OVER PERIOD OF YEARS

Chance of Flooding over a Period of Years

Time Period	Flood Size 10-year	25-year	50-year	100-year
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%

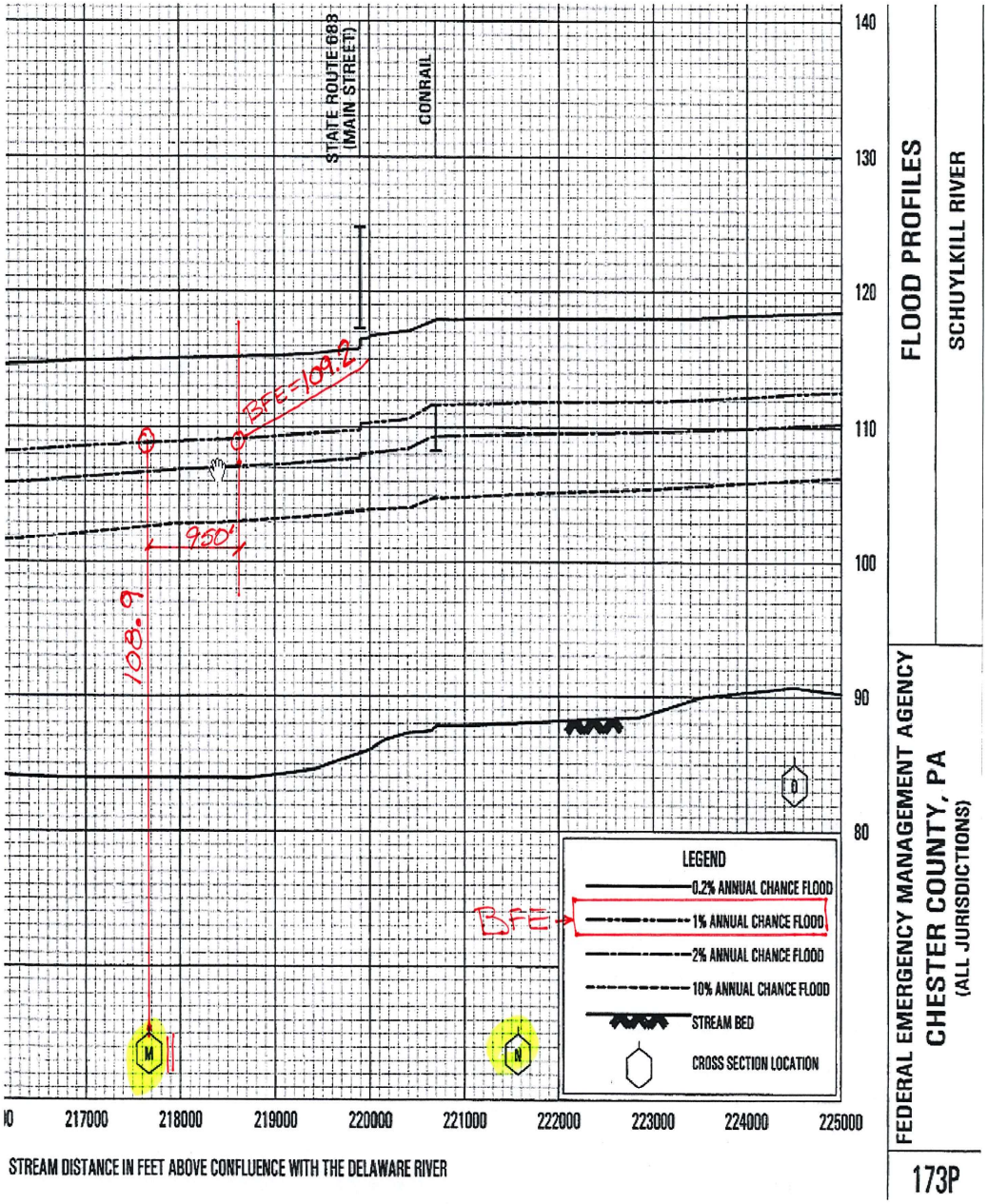
Exceedance probability (1 Year)
Pe = 1/Return period
100-year flood = 1/100 or 1%/1 year
Pe for more than 1 year time period
$Pe = 1- (1-Pe)^{nyears}$
$Pe = 1-(1-.01)^{30} = .26$
So for 30 year time period (typical mortgage)
a 100-year Flood would have probability
occurring one time = 26%.



DEPTH OF FLOOD FLOW IS NON LINEAR

At the location shown, Stream bottom is 84.0 feet.

Flood (yr)	Flood El. (ft)	Flood Depth (ft)
10	103.1	19.1
50	107.1	23.1
100	109.2	25.2
500	115.1	31.1



Using the Flood Insurance Study

- Use the FIS report for:
  - flood determinations for specific sites
  - finding the **most accurate BFE** data
  - **DO NOT** use the FIRM for elevation determinations
  - Red flag when reviewing elevation data from surveyors – whole number BFEs

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Allegheny River (Continued)								
BE	69,066	828	24,522	7.9	743.1	743.1	743.7	0.6
CA	70,512	823	23,208	7.9	743.1	743.1	743.7	0.6
CB	71,589	1,597	44,248	5.7	743.8	743.8	744.4	0.6
CC	72,686	1,619	43,333	5.8	743.9	743.9	744.5	0.6
CD	73,928	1,473	36,953	6.5	744.0	744.0	744.6	0.6
CE	75,246	695	10,946	7.9	744.1	744.1	744.6	0.5
CF	76,672	1,525	44,642	5.7	744.8	744.8	745.3	0.5
CG	78,077	1,467	32,447	7.8	746.9	746.9	747.9	1.0
CH	77,888	1,683	36,433	6.6	747.8	747.8	748.8	0.9
CI	79,778	1,653	41,501	6.1	747.9	747.9	748.8	0.9
CJ	79,209	1,443	39,935	6.5	747.9	747.9	748.8	0.9
CK	80,629	1,189	31,747	8.0	748.0	748.0	748.9	0.9
CL	81,842	1,061	30,425	8.3	748.0	748.0	749.1	0.9
CM	83,188	998	28,584	8.5	748.4	748.4	749.2	0.8
CN	84,466	852	24,726	10.2	748.7	748.7	749.5	0.8
CO	85,606	760	24,933	10.2	748.2	748.2	748.9	0.7
CP	87,120	1,013	40,934	5.4	750.7	750.7	751.4	0.7
CQ	88,442	1,154	40,159	6.3	750.7	750.7	751.4	0.7
CR	89,766	1,072	44,993	5.6	750.9	750.9	751.5	0.6
CS	91,080	1,109	39,202	6.5	751.1	751.1	751.7	0.6
CT	92,468	1,374	45,261	5.6	751.4	751.4	752.0	0.6

[1] Feet above confluence with Ohio River

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLEGHENY COUNTY, PA
(ALL JURISDICTIONS)

FLOODWAY DATA

ALLEGHENY RIVER

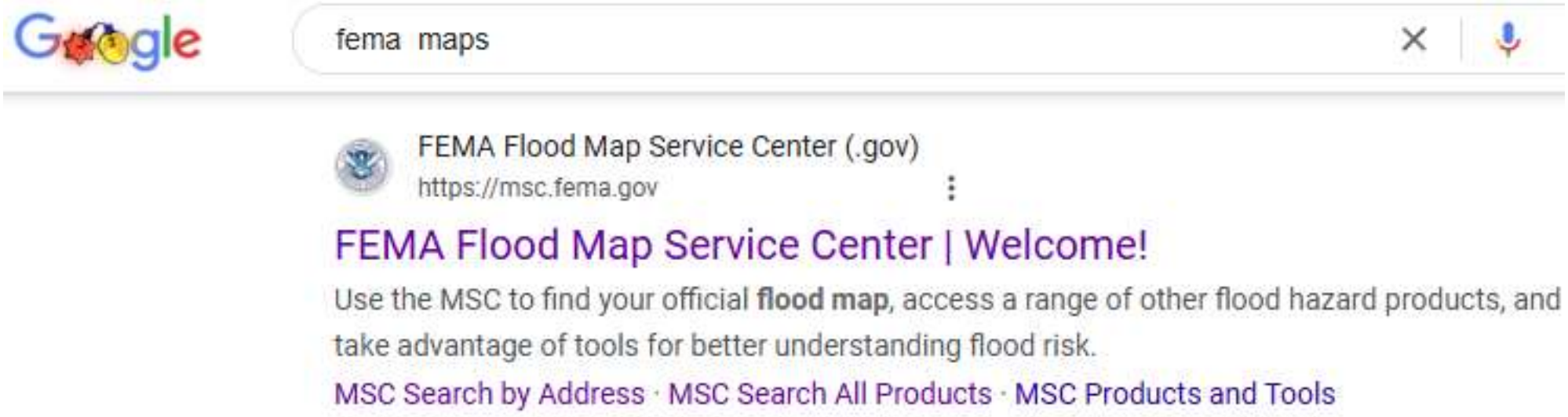
Additional Data Not on FIRMs

- Zone A floodplains present a challenge
  - No BFEs available to inform how high to build
- Automated H&H was run for Zone A
  - Floodplain exists behind the scenes
  - Not detailed enough to be included on the FIRMs but can be used to approximate a 1% flood elevation
- Caveats: bridges and culverts not taken into consideration
  - Requires special skills to interpret data

Zone A cross sections may be available

SEARCHING AND READING FEMA MAPS

1. Google search for FEMA Flood Maps: https://msc.fema.gov



SEARCHING AND READING FEMA MAPS

1. Type in address of property or Click Map Panel ID and type in map panel.
2. Search

Looking for a Flood Map?

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

Enter an address, a place, or longitude/latitude coordinates | Search

Looking for more than just a current flood map?

Visit **Search All Products** to access the full range of flood risk products for your community.

FEMA Flood Map Service Center: Search By Address

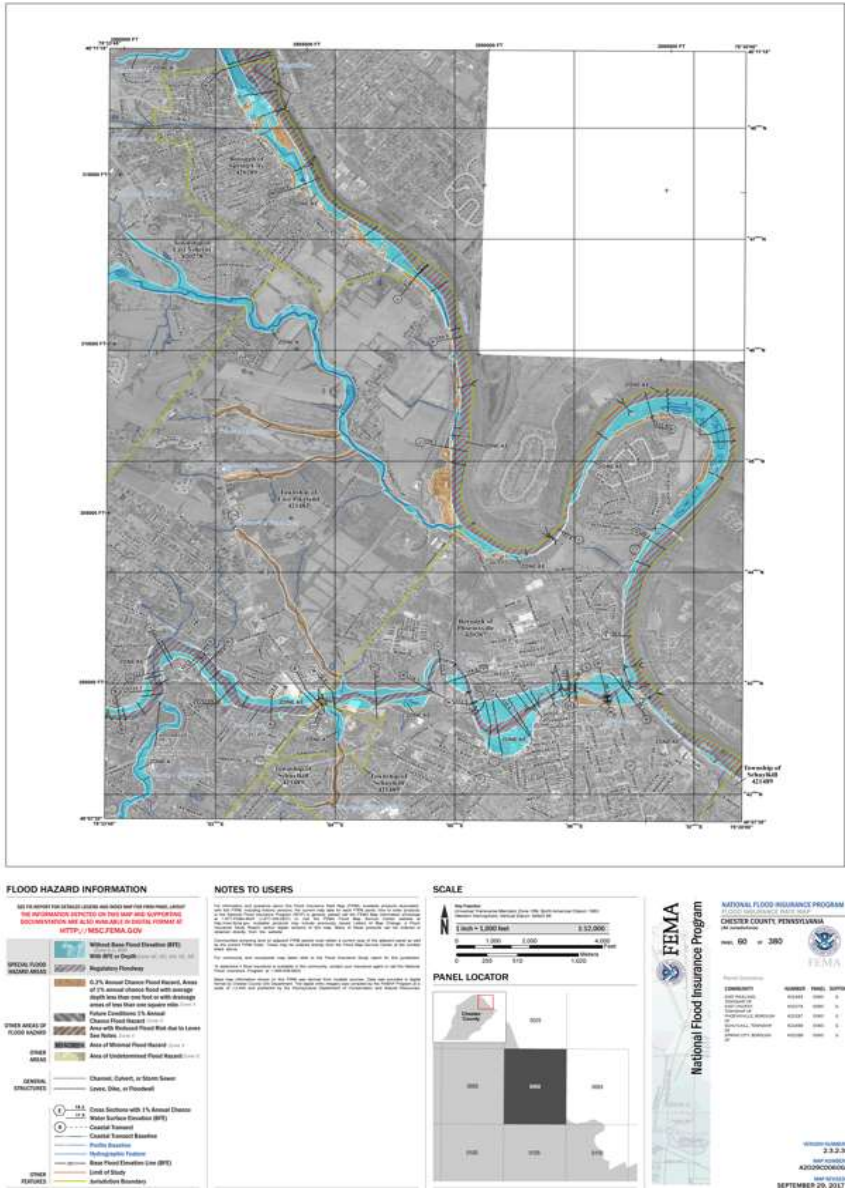
Enter an address, place, or coordinates:

1 S Main Street, spring, city pa | Search

SEARCHING AND READING FEMA MAPS

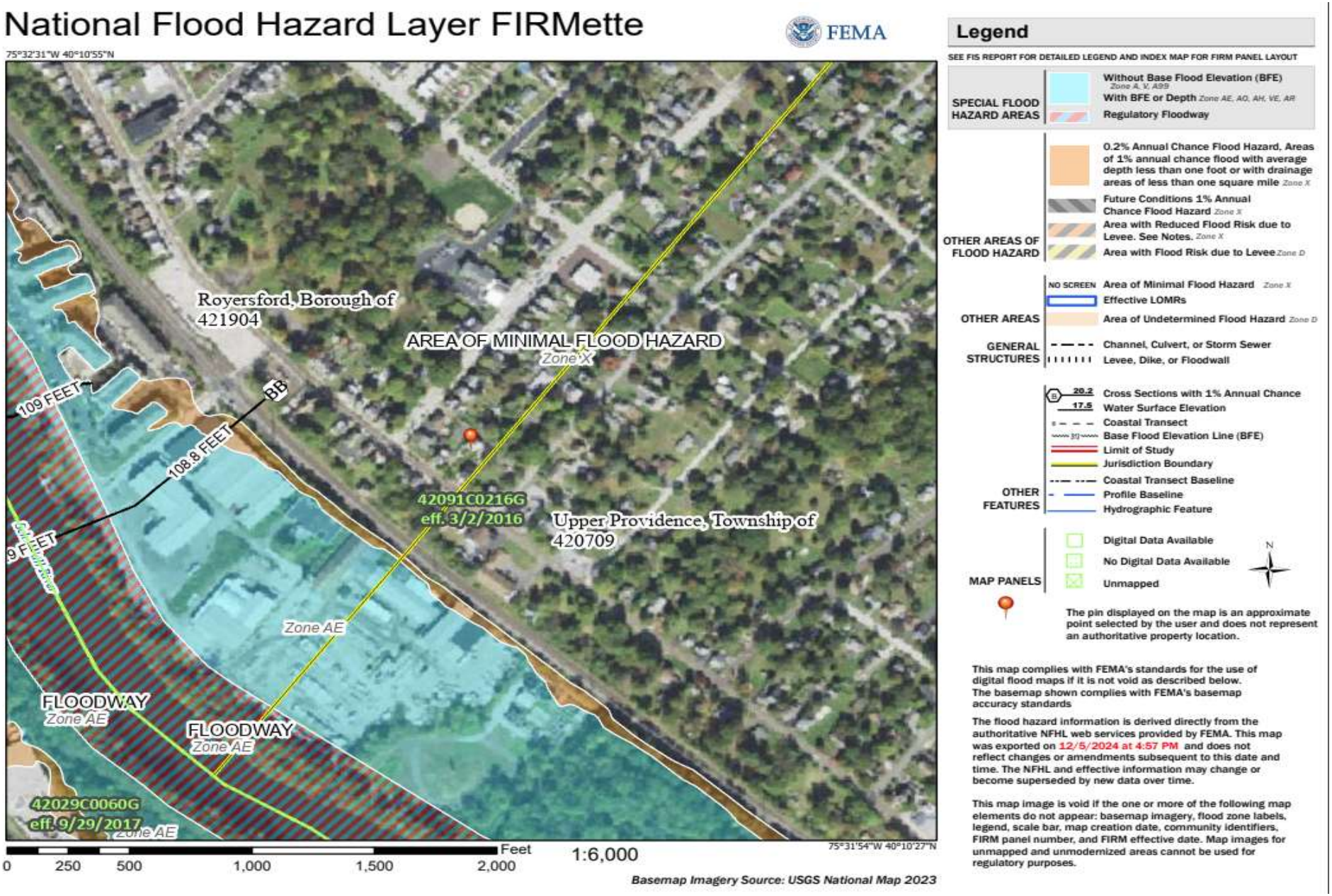
SEARCHING AND READING FEMA MAPS

1. Download of FIRM Panel option - Zoom and pan until you find your site.



SEARCHING AND READING FEMA MAPS

1. Dynamic Map Option – Print Map / Firmette

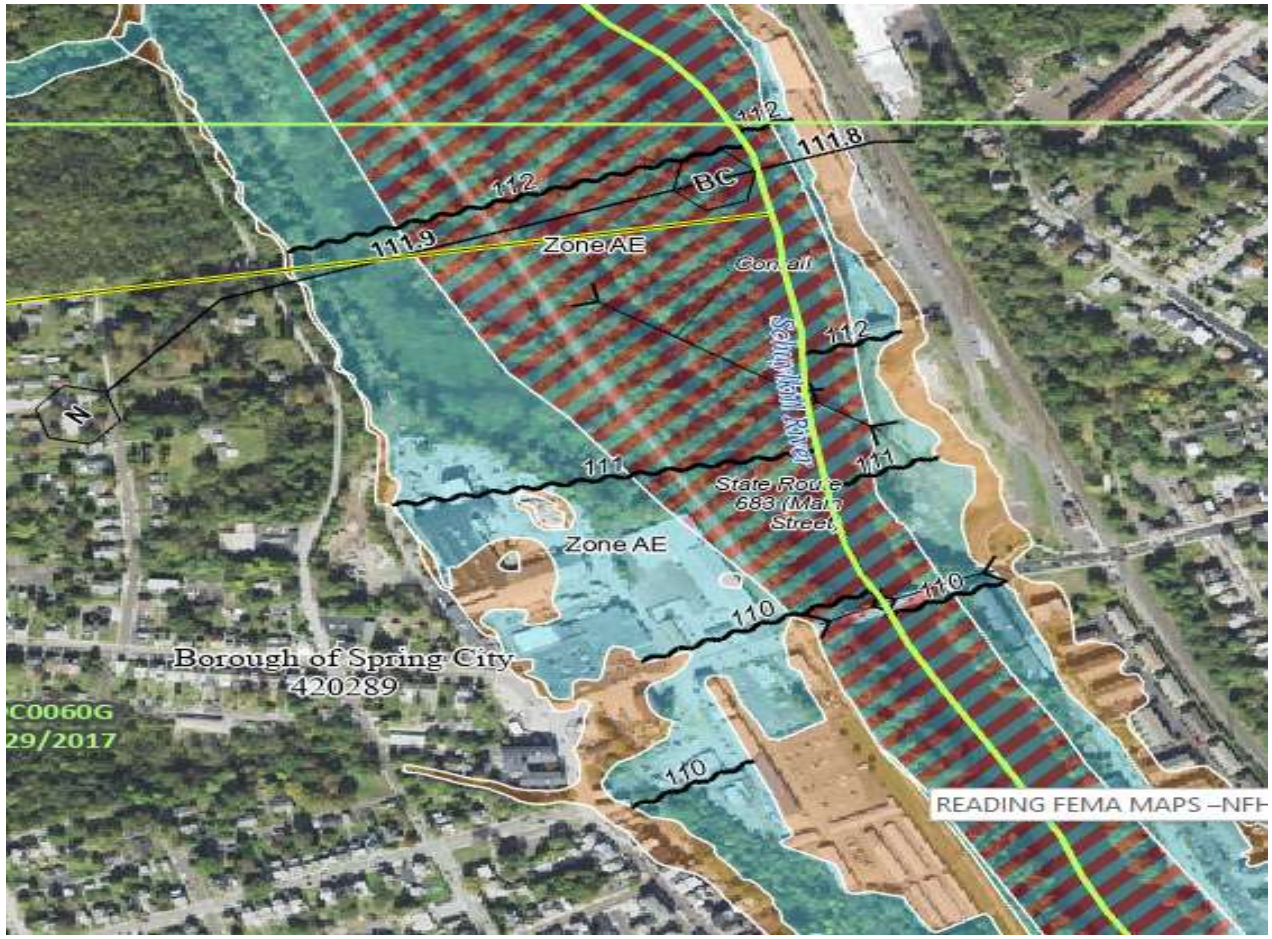


SEARCHING AND READING FEMA MAPS

- Use Mouse to scroll and zoom in until you can read the map properly.

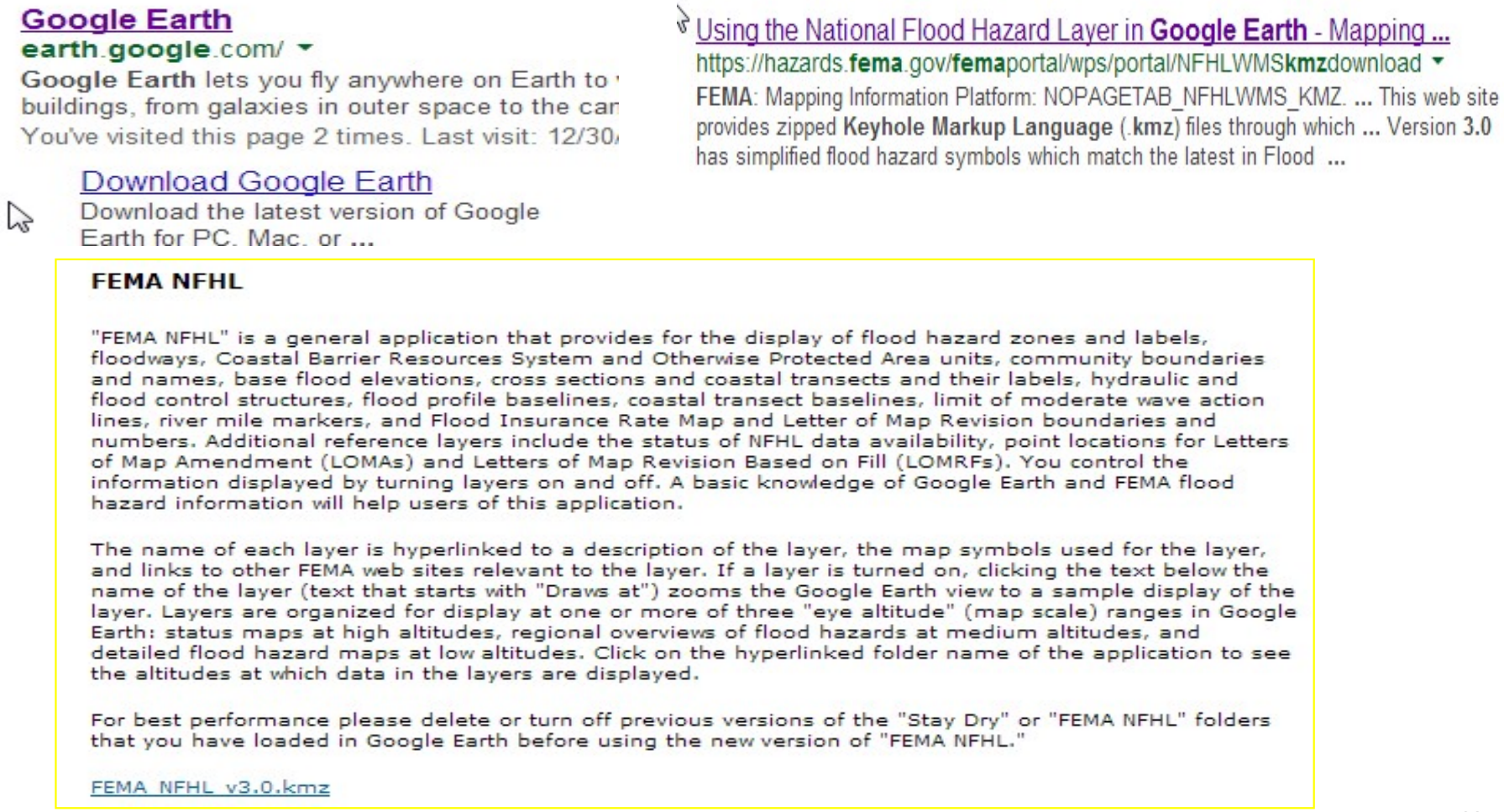
READING FEMA MAPS –NFHL Viewer option

- Schuylkill River is Zone AE, with Floodway
- Tributary No. 2 is a “Zone A” Stream (no BFEs determined)
- Areas outside the flood plain are Zone X
- “111” indicates BFE elevation to nearest foot
- “N” = cross section location used in profile and Floodway table.
- Note that Montgomery County side of river not mapped.



ANOTHER APPROACH USING GOOGLE EARTH

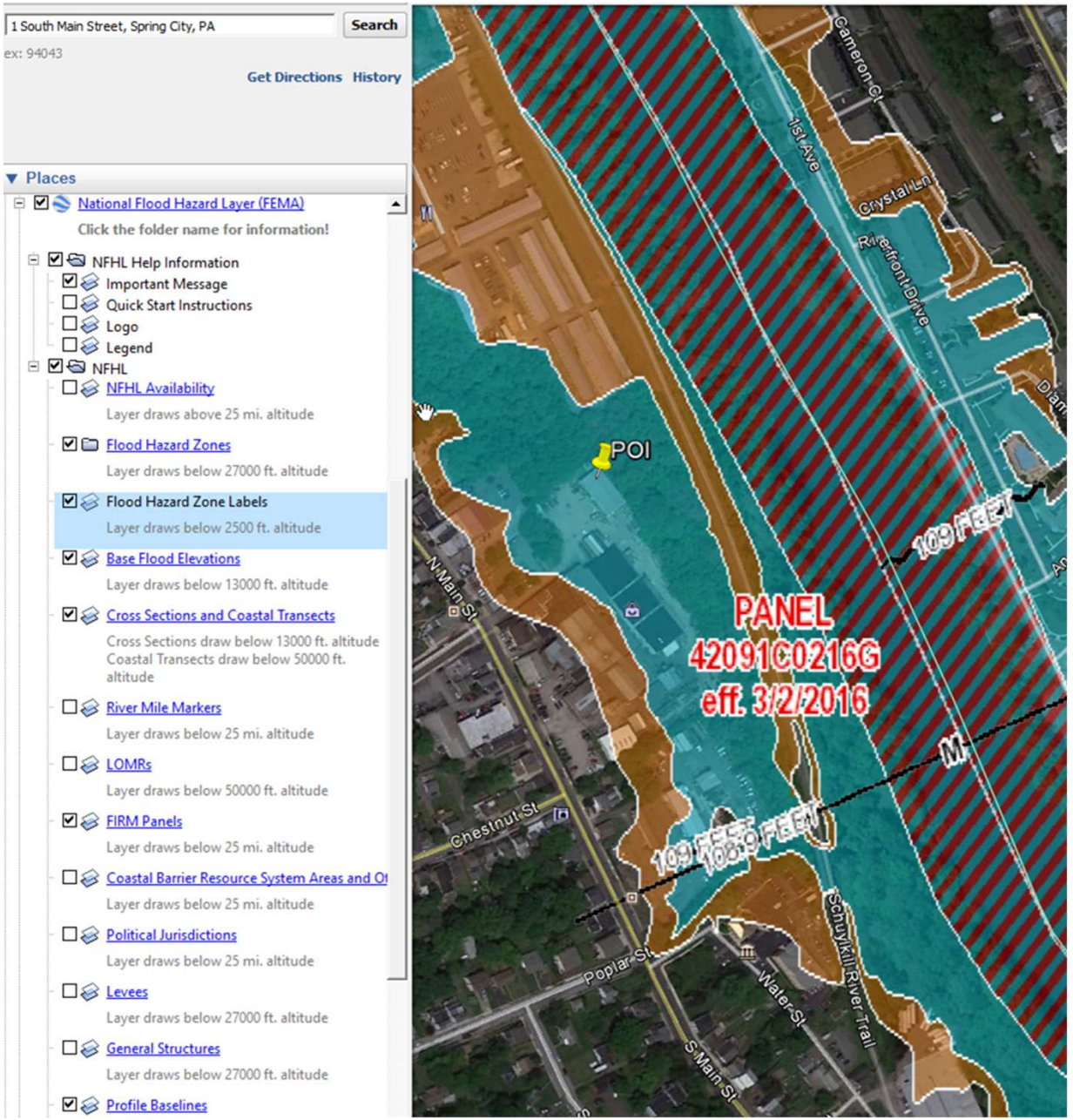
- Download and install Google Earth (earth.google.com)
- Search for FEMA NFHL v3.4 kmz (not the Stay Dry file)
- Save the file to your desktop
- Double click the kmz file to run inside Google Earth



ANOTHER (BETTER) APPROACH USING GOOGLE EARTH

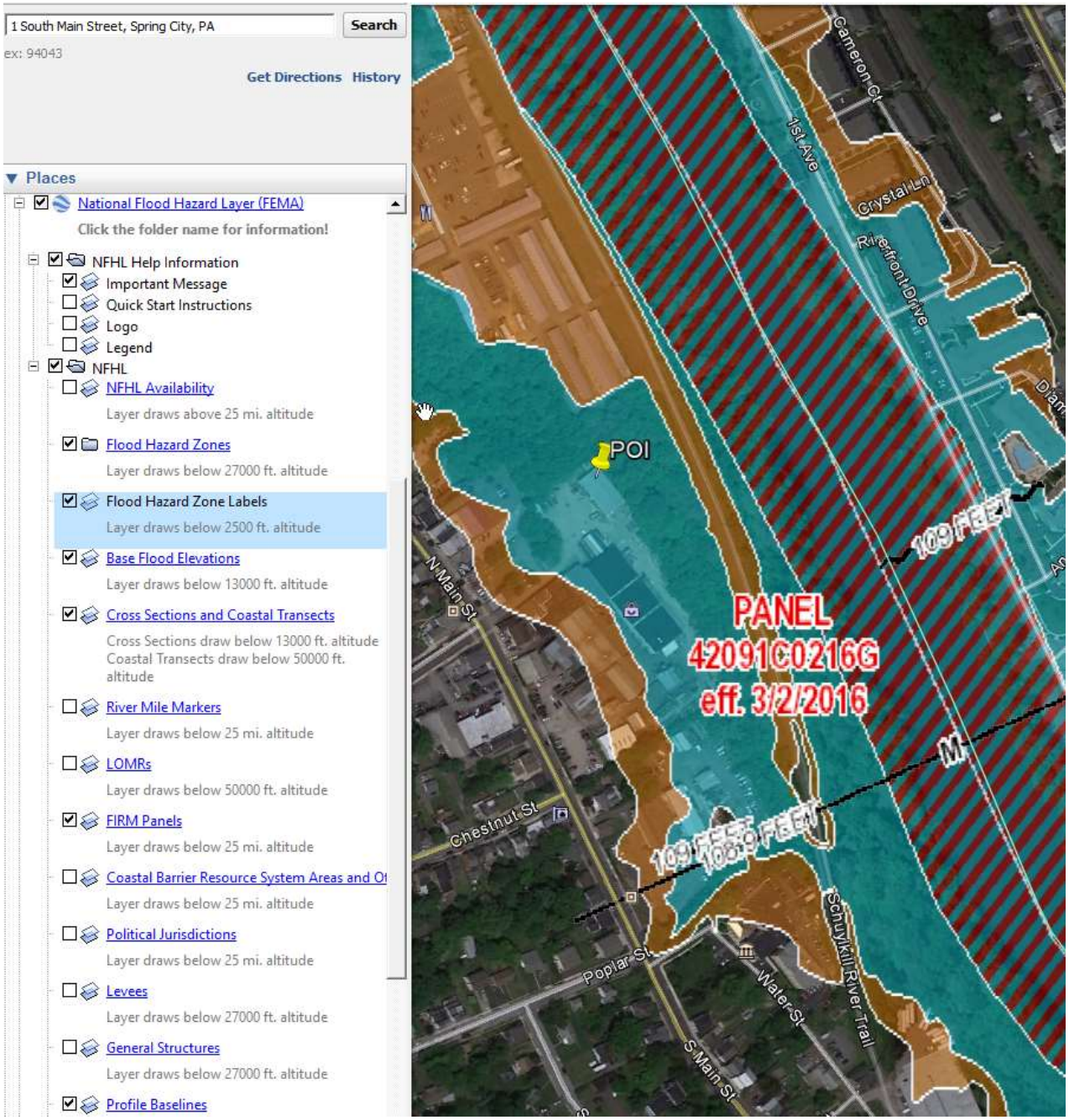
WHY?

- Can see actual structures and landmarks. Published FIRMS make it difficult to see buildings, streets, etc.
- Unlike the FIRMETTE process, you won't need to pan and zoom to find your property.
- Can turn layers on and off.
- BFEs are superimposed on the cross-sections. No need to look up floodway table.
- Measurement tools available to scale distances from cross-sections.
- Latitude and Longitude are available to use on Elevation Certificate.
- Using the cursor, you are also able to obtain some elevations.
- LOMA and LOMR locations show on map.



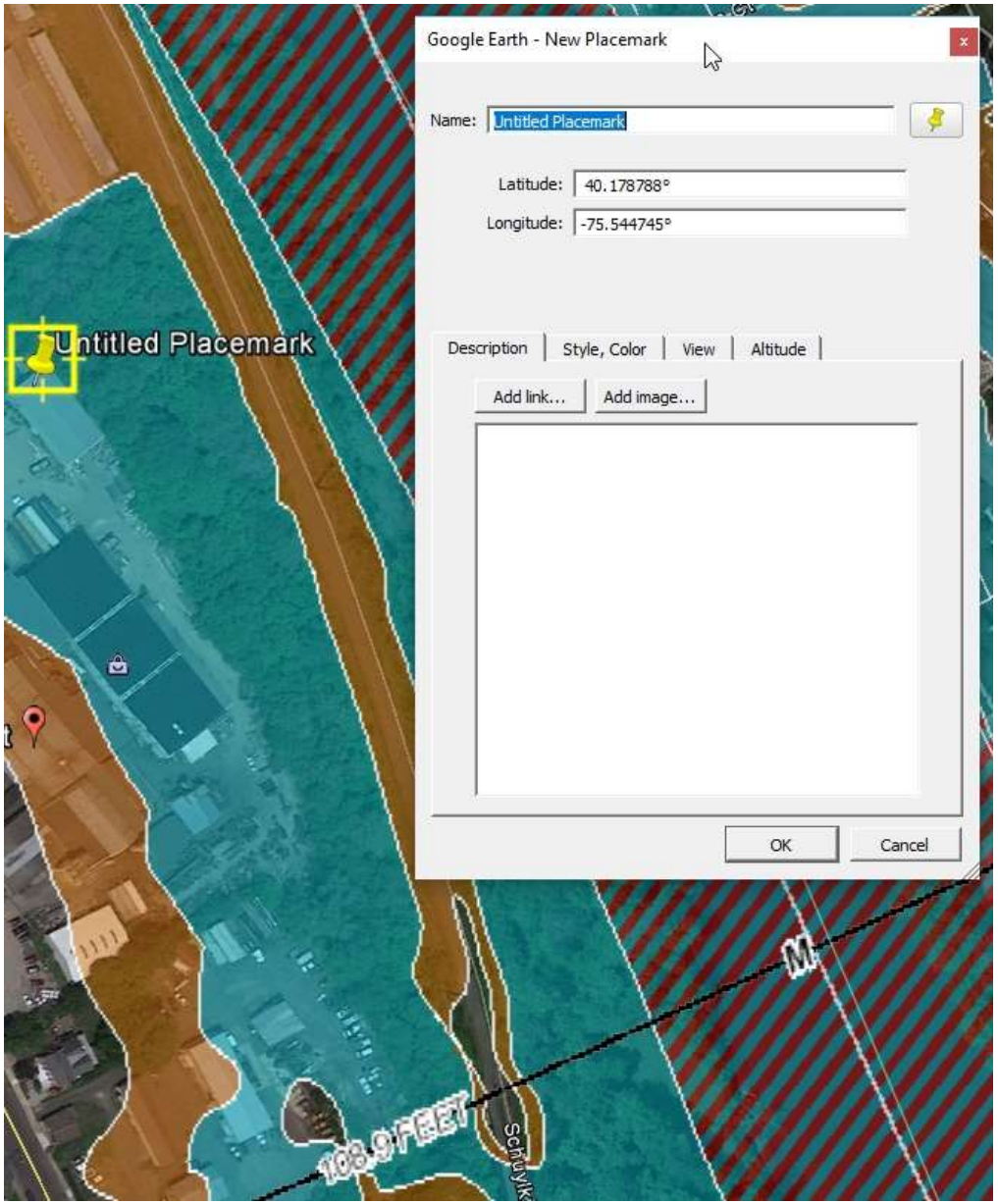
GOOGLE EARTH KMZ SEARCH

- Enter property address or location in search field.
- Under “places”, select the appropriate FEMA check boxes. Use:
  - Legend if needed
  - Flood Hazard Zones
  - Base Flood elevations
  - Cross Sections and Coastal Transects
  - Turn on FIRM Panels as needed.
  - Zoom in or out to pinpoint the location desired.



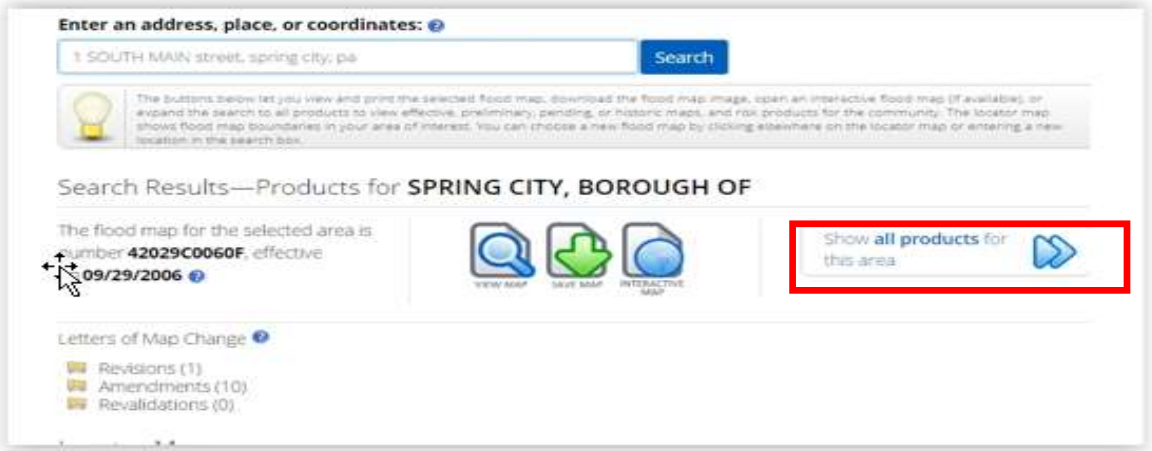
GOOGLE EARTH KMZ SEARCH

- Advantages of Google Earth search:
  - Can see actual aerial views to locate buildings, landmarks not shown on paper maps
  - Use GE to determine Latitude and Longitude of site/structures.
  - Can scale distances from a stream cross-section to a site.
  - Cross-sections (“M-M”) display BFE at that cross-section.
  - Do NOT use the even flood elevations, since they are only accurate to one foot. Need 0.1 foot accuracy.
  - Use flood profiles in the Flood Insurance Study to determine the BFE using the distances measured along the flow line to the POI.



FIS WEBSITE SEARCH FOR FLOODWAY & FLOOD PROFILES

- DETERMINE BFE FROM FIS
  - After site location is shown, click on “Show all products for this area”
  - Look for Effective Products (meaning they are currently in force).
  - Click “DL ALL” for “FIS REPORTS”. This will download the Flood Insurance Study for the County.
  - Unzip the “Zip” file.
  - In this Case there are 3 volumes for Chester County, PA.
  - Volume 1A Contains the table of contents, to enable you to find the Floodway Table and the profile sheets.



Chester County FIS files

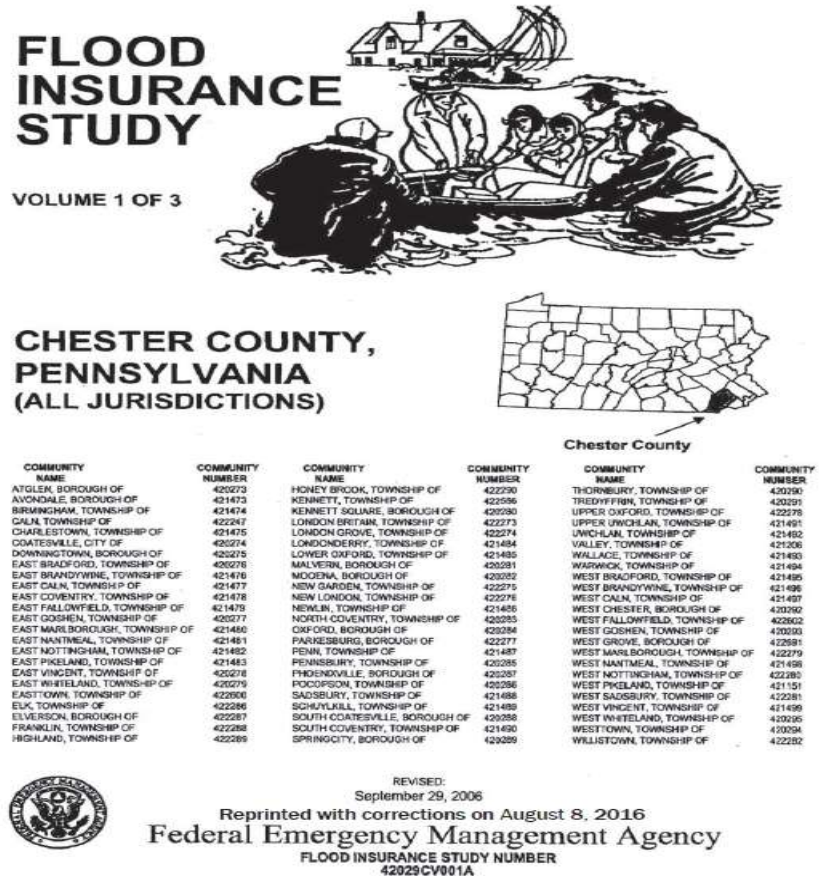
42029CV001A.pdf

42029CV002A.pdf

42029CV003A.pdf

FIS – Floodway tables list BFEs at Cross-Sections

- DETERMINE BFE FROM FIS
  - Open Volume 1 file and search table of contents for “Floodway Data”. These tables contain the BFE at each cross-section.



FLOOD INSURANCE STUDY

VOLUME 1 OF 3

CHESTER COUNTY, PENNSYLVANIA
(ALL JURISDICTIONS)

Chester County

COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
ATGLEN, BOROUGH OF	420273	HONEY BROOK, TOWNSHIP OF	422290	THORNBURY, TOWNSHIP OF	420290
AVONDALE, BOROUGH OF	421473	KENNETT, TOWNSHIP OF	422596	TREDYFFRIN, TOWNSHIP OF	420291
BIRMINGHAM, TOWNSHIP OF	421474	KENNETT SQUARE, BOROUGH OF	420280	UPPER OXFORD, TOWNSHIP OF	422278
CALN, TOWNSHIP OF	422247	LONDON BRITAIN, TOWNSHIP OF	422273	UPPER UWCHLAN, TOWNSHIP OF	421491
CHARLESTOWN, TOWNSHIP OF	421475	LONDON GROVE, TOWNSHIP OF	422274	UWCHLAN, TOWNSHIP OF	421492
COATESVILLE, CITY OF	420274	LONDONDERRY, TOWNSHIP OF	421484	VALLEY, TOWNSHIP OF	421206
DOWNINGTOWN, BOROUGH OF	420275	LOWER OXFORD, TOWNSHIP OF	421485	WALLACE, TOWNSHIP OF	421493
EAST BRADFORD, TOWNSHIP OF	420276	MALVERN, BOROUGH OF	420281	WARWICK, TOWNSHIP OF	421494
EAST BRANDYWINE, TOWNSHIP OF	421476	MODENA, BOROUGH OF	420282	WEST BRADFORD, TOWNSHIP OF	421495
EAST CALN, TOWNSHIP OF	421477	NEW GARDEN, TOWNSHIP OF	422275	WEST BRANDYWINE, TOWNSHIP OF	421496
EAST COVENTRY, TOWNSHIP OF	421478	NEW LONDON, TOWNSHIP OF	422276	WEST CALN, TOWNSHIP OF	421497
EAST FALLOWFIELD, TOWNSHIP OF	421479	NEWLIN, TOWNSHIP OF	421486	WEST CHESTER, BOROUGH OF	420292
EAST GOSHEN, TOWNSHIP OF	420277	NORTH COVENTRY, TOWNSHIP OF	420283	WEST FALLOWFIELD, TOWNSHIP OF	422602
EAST MARLBOROUGH, TOWNSHIP OF	421480	OXFORD, BOROUGH OF	420284	WEST GOSHEN, TOWNSHIP OF	420293
EAST NANTMEAL, TOWNSHIP OF	421481	PARKESBURG, BOROUGH OF	422277	WEST GROVE, BOROUGH OF	422581
EAST NOTTINGHAM, TOWNSHIP OF	421482	PENN, TOWNSHIP OF	421487	WEST MARLBOROUGH, TOWNSHIP OF	422279
EAST PIKELAND, TOWNSHIP OF	421483	PENNSBURY, TOWNSHIP OF	420285	WEST NANTMEAL, TOWNSHIP OF	421498
EAST VINCENT, TOWNSHIP OF	420278	PHOENIXVILLE, BOROUGH OF	420287	WEST NOTTINGHAM, TOWNSHIP OF	422280
EAST WHITELAND, TOWNSHIP OF	420279	POCOPSON, TOWNSHIP OF	420286	WEST PIKELAND, TOWNSHIP OF	421151
EASTTOWN, TOWNSHIP OF	422600	SADSBURY, TOWNSHIP OF	421488	WEST SADSBURY, TOWNSHIP OF	422281
ELK, TOWNSHIP OF	422286	SCHUYLKILL, TOWNSHIP OF	421489	WEST VINCENT, TOWNSHIP OF	421499
ELVERSON, BOROUGH OF	422287	SOUTH COATESVILLE, BOROUGH OF	420288	WEST WHITELAND, TOWNSHIP OF	420295
FRANKLIN, TOWNSHIP OF	422288	SOUTH COVENTRY, TOWNSHIP OF	421490	WESTTOWN, TOWNSHIP OF	420294
HIGHLAND, TOWNSHIP OF	422289	SPRINGCITY, BOROUGH OF	420289	WILLISTOWN, TOWNSHIP OF	422282

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September 29, 2006
Reprinted with corrections on August 8, 2016
Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
42029CV001A

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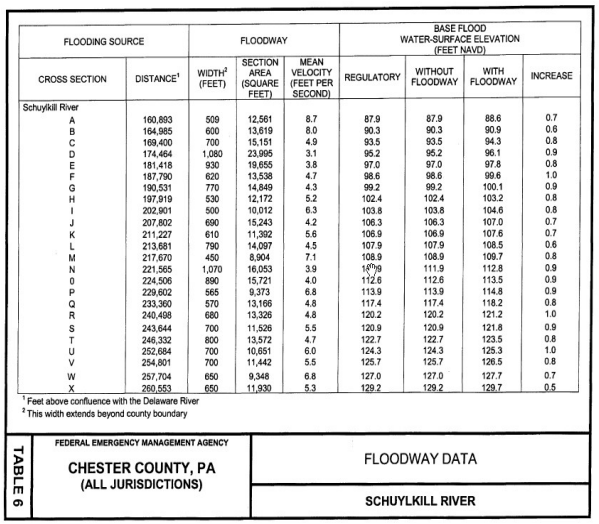
FIGURES

TABLES

FIS – Floodway Tables

- DETERMINE BFE FROM FIS
  - Read Base Flood Elevations for Cross-Section “M” under “Regulatory” column.
  - Elevation is 108.9 feet.
  - Agrees with GE Section M.



FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Schuylkill River								
A	160,893	509	12,561	8.7	87.9	87.9	88.6	0.7
B	164,985	600	13,619	8.0	90.3	90.3	90.9	0.6
C	169,400	700	15,151	4.9	93.5	93.5	94.3	0.8
D	174,464	1,080	23,995	3.1	95.2	95.2	96.1	0.9
E	181,418	930	19,655	3.8	97.0	97.0	97.8	0.8
F	187,790	620	13,538	4.7	98.6	98.6	99.6	1.0
G	190,531	770	14,849	4.3	99.2	99.2	100.1	0.9
H	197,919	530	12,172	5.2	102.4	102.4	103.2	0.8
I	202,901	500	10,012	6.3	103.8	103.8	104.6	0.8
J	207,802	690	15,243	4.2	106.3	106.3	107.0	0.7
K	211,227	610	11,392	5.6	106.9	106.9	107.6	0.7
L	213,681	790	14,097	4.5	107.9	107.9	108.5	0.6
M	217,670	450	8,904	7.1	108.9	108.9	109.7	0.8
N	221,565	1,070	16,053	3.9	110.9	111.9	112.8	0.9
O	224,506	890	15,721	4.0	112.6	112.6	113.5	0.9
P	229,602	565	9,373	6.8	113.9	113.9	114.8	0.9
Q	233,360	570	13,166	4.8	117.4	117.4	118.2	0.8
R	240,498	680	13,326	4.8	120.2	120.2	121.2	1.0
S	243,644	700	11,526	5.5	120.9	120.9	121.8	0.9
T	246,332	800	13,572	4.7	122.7	122.7	123.5	0.8
U	252,684	700	10,651	6.0	124.3	124.3	125.3	1.0
V	254,801	700	11,442	5.5	125.7	125.7	126.5	0.8
W	257,704	650	9,348	6.8	127.0	127.0	127.7	0.7
X	260,553	650	11,930	5.3	129.2	129.2	129.7	0.5

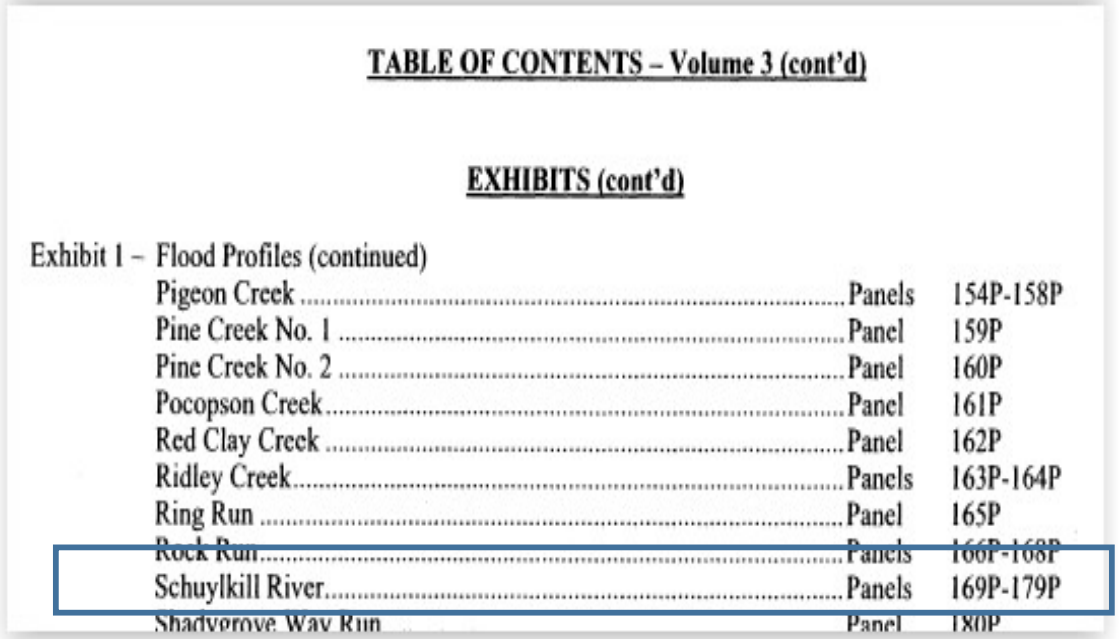
[1] Feet above confluence with the Delaware River
[2] This width extends beyond county boundary

TABLE 6 — FEDERAL EMERGENCY MANAGEMENT AGENCY — CHESTER COUNTY, PA (ALL JURISDICTIONS) — FLOODWAY DATA — SCHUYLKILL RIVER

FLOODING SOURCE		FLOODWAY			W/
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY
Schuylkill River					
A	160,893	509	12,561	8.7	87.9
B	164,985	600	13,619	8.0	90.3
C	169,400	700	15,151	4.9	93.5
D	174,464	1,080	23,995	3.1	95.2
E	181,418	930	19,655	3.8	97.0
F	187,790	620	13,538	4.7	98.6
G	190,531	770	14,849	4.3	99.2
H	197,919	530	12,172	5.2	102.4
I	202,901	500	10,012	6.3	103.8
J	207,802	690	15,243	4.2	106.3
K	211,227	610	11,392	5.6	106.9
L	213,681	790	14,097	4.5	107.9
M	217,670	450	8,904	7.1	108.9
N	221,565	1,070	16,053	3.9	110.9

FIS – Search for Flood Profiles

- DETERMINE BFE FROM FIS
  - Open Volume 1 file and search table of contents for “Flood Profiles”. These sheets contain the profiles for each stream in alphabetical order.
  - Schuylkill River is in **Volume 3, Panels 169P-179P**



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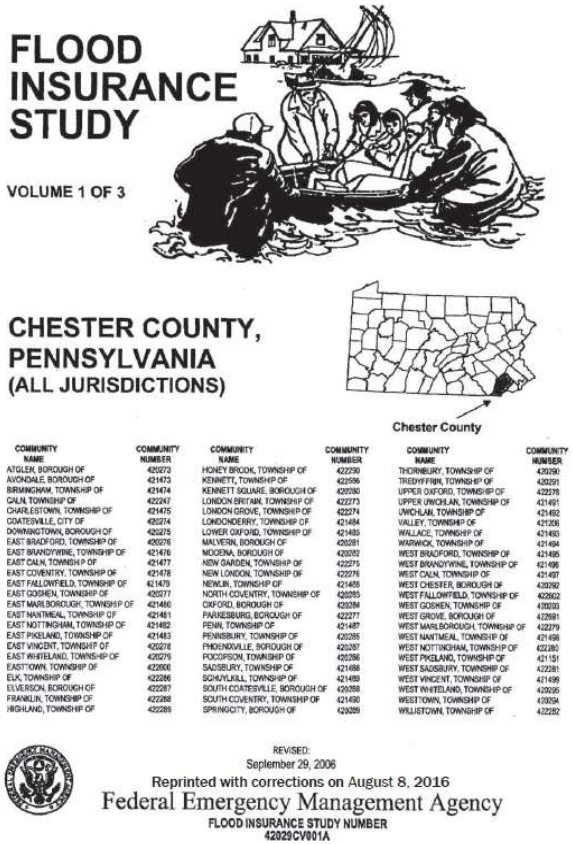
EXHIBITS (cont'd)



FLOOD INSURANCE STUDY

VOLUME 1 OF 3

CHESTER COUNTY, PENNSYLVANIA
(ALL JURISDICTIONS)

Chester County

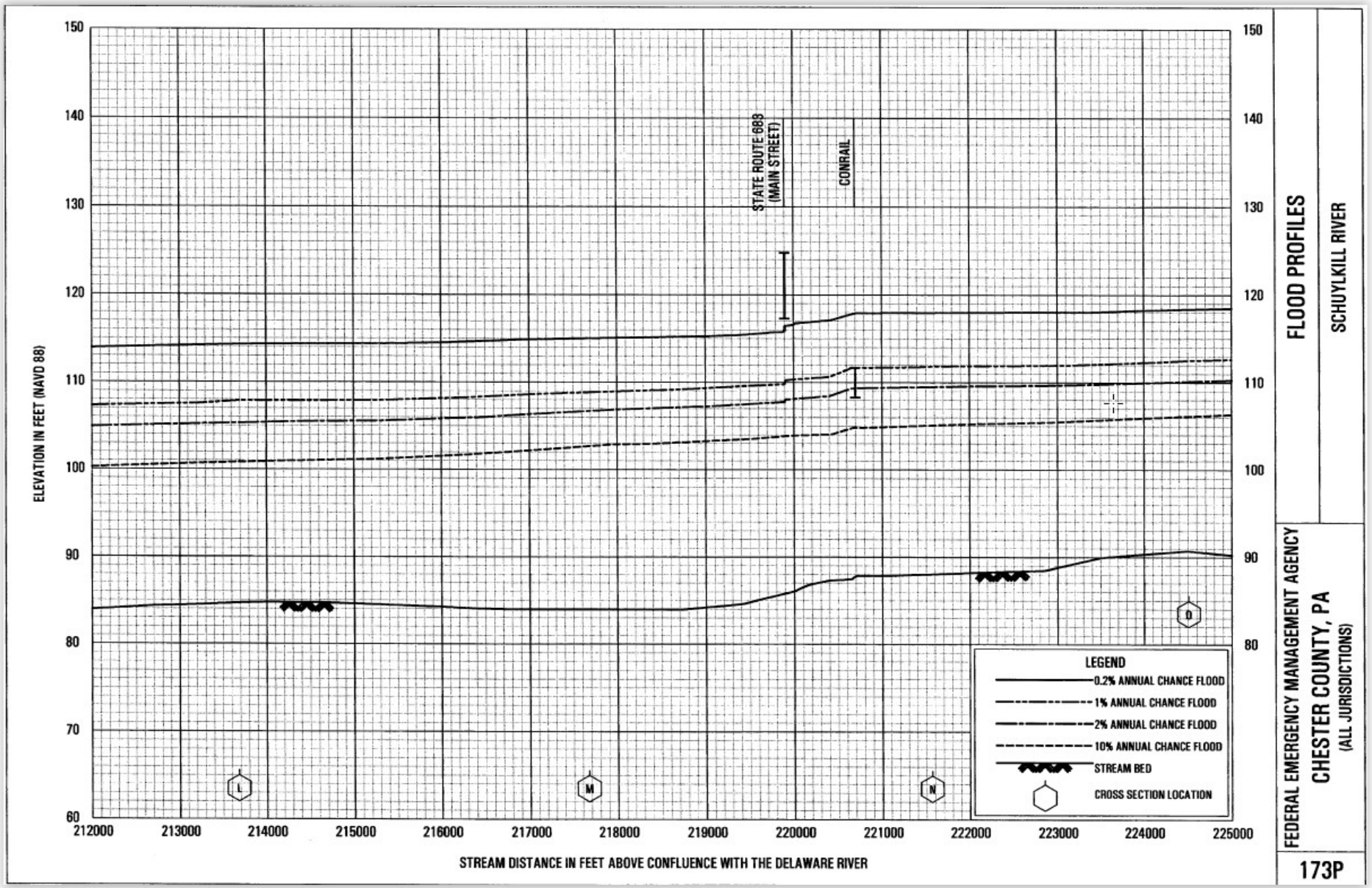
COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
ATGLEN, BOROUGH OF	420273	HONEY BROOK, TOWNSHIP OF	422290	THORNBURY, TOWNSHIP OF	420290
AVONDALE, BOROUGH OF	421473	KENNETT, TOWNSHIP OF	422586	TREDYFFRIN, TOWNSHIP OF	420291
BIRMINGHAM, TOWNSHIP OF	421474	KENNETT SQUARE, BOROUGH OF	420290	UPPER OXFORD, TOWNSHIP OF	422276
CALN, TOWNSHIP OF	422247	LONDON BRITAIN, TOWNSHIP OF	422273	UPPER UWCHLAN, TOWNSHIP OF	421491
CHARLESTOWN, TOWNSHIP OF	421475	LONDON GROVE, TOWNSHIP OF	422274	UWCHLAN, TOWNSHIP OF	421492
COATESVILLE, CITY OF	420274	LONDONDERRY, TOWNSHIP OF	421484	VALLEY, TOWNSHIP OF	421206
DOWNINGTOWN, BOROUGH OF	422275	LOWER OXFORD, TOWNSHIP OF	421485	WALLACE, TOWNSHIP OF	421493
EAST BRADFORD, TOWNSHIP OF	420276	MALVERN, BOROUGH OF	420291	WARWICK, TOWNSHIP OF	421494
EAST BRANDYWINE, TOWNSHIP OF	421476	MODENA, BOROUGH OF	420292	WEST BRADFORD, TOWNSHIP OF	421495
EAST CALN, TOWNSHIP OF	421477	NEW GARDEN, TOWNSHIP OF	422275	WEST BRANDYWINE, TOWNSHIP OF	421496
EAST COVENTRY, TOWNSHIP OF	421478	NEW LONDON, TOWNSHIP OF	422276	WEST CALN, TOWNSHIP OF	421497
EAST FALLOWFIELD, TOWNSHIP OF	421479	NEWLIN, TOWNSHIP OF	421405	WEST CHESTER, BOROUGH OF	420292
EAST GOSHEN, TOWNSHIP OF	420277	NORTH COVENTRY, TOWNSHIP OF	420293	WEST FALLOWFIELD, TOWNSHIP OF	422602
EAST MARLBOROUGH, TOWNSHIP OF	421480	OXFORD, BOROUGH OF	420294	WEST GOSHEN, TOWNSHIP OF	420293
EAST NANTMEAL, TOWNSHIP OF	421481	PARKESBURG, BOROUGH OF	422277	WEST GROVE, BOROUGH OF	422591
EAST NOTTINGHAM, TOWNSHIP OF	421482	PENN, TOWNSHIP OF	421487	WEST MARLBOROUGH, TOWNSHIP OF	422279
EAST PIKELAND, TOWNSHIP OF	421483	PENNSBURY, TOWNSHIP OF	420295	WEST NANTMEAL, TOWNSHIP OF	421498
EAST VINCENT, TOWNSHIP OF	420278	PHOENIXVILLE, BOROUGH OF	420297	WEST NOTTINGHAM, TOWNSHIP OF	422280
EAST WHITELAND, TOWNSHIP OF	420279	POCOPSON, TOWNSHIP OF	420296	WEST PIKELAND, TOWNSHIP OF	421151
EASTTOWN, TOWNSHIP OF	422606	SADSBURY, TOWNSHIP OF	421488	WEST SADSBURY, TOWNSHIP OF	422281
ELK, TOWNSHIP OF	422286	SCHUYLKILL, TOWNSHIP OF	421489	WEST VINCENT, TOWNSHIP OF	421499
ELVERSON, BOROUGH OF	422287	SOUTH COATESVILLE, BOROUGH OF	420298	WEST WHITELAND, TOWNSHIP OF	420295
FRANKLIN, TOWNSHIP OF	422288	SOUTH COVENTRY, TOWNSHIP OF	421490	WESTTOWN, TOWNSHIP OF	420294
HIGHLAND, TOWNSHIP OF	422289	SPRINGCITY, BOROUGH OF	420299	WILLISTOWN, TOWNSHIP OF	422282

REVISED:
September 29, 2006
Reprinted with corrections on August 8, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
42029CV001A

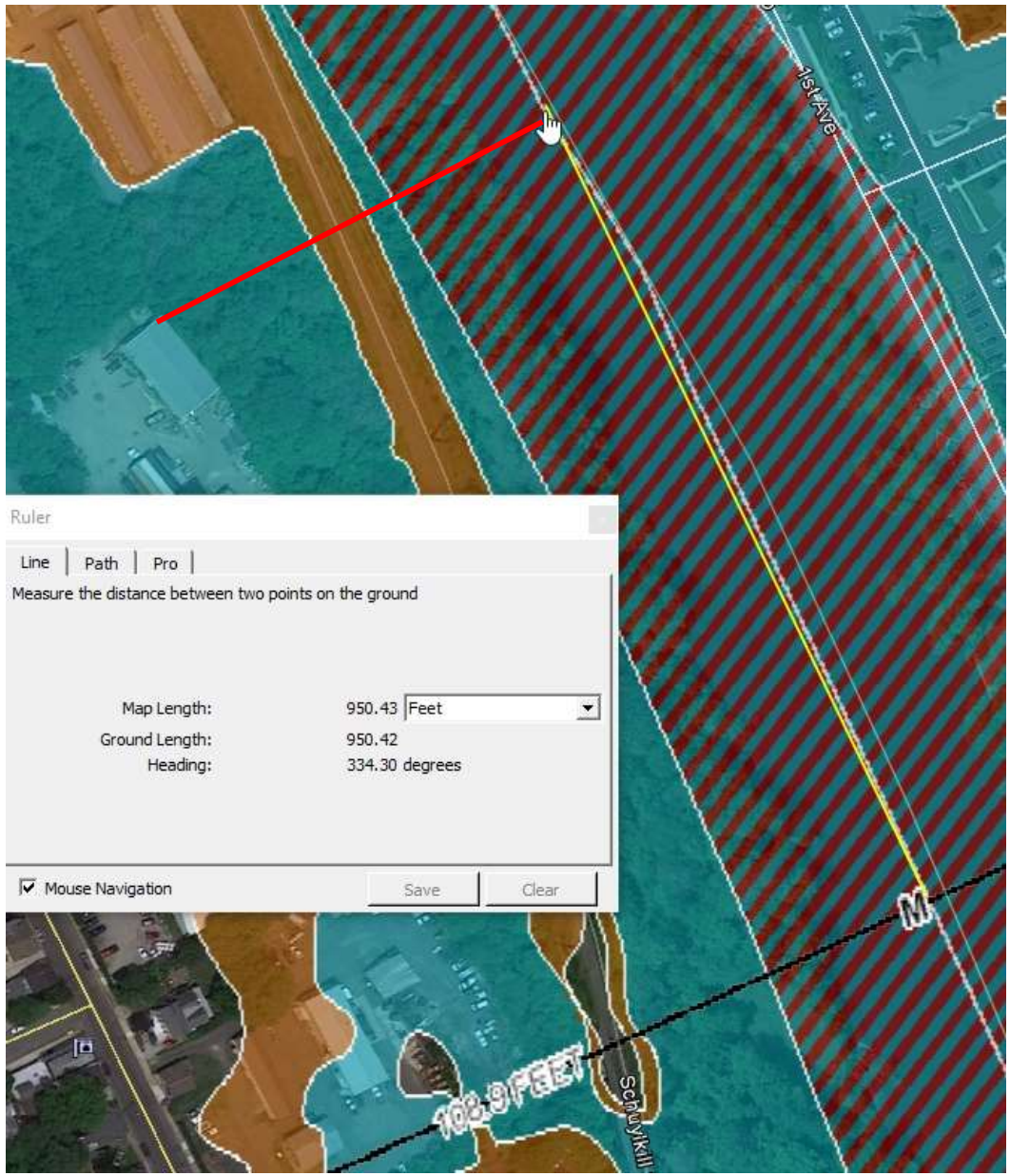
- **DETERMINE BFE FROM FIS PROFILES**
  - Panel 173P contains Schuylkill River cross-sections L, M, N and O.



Flood Profile Provides Accurate BFE

Scale distance from known cross-section to POI
Pick 100-year or 1% chance flood

- DETERMINE BFE FROM FIS
  - POI is 950 feet upstream of Section M (toward N).



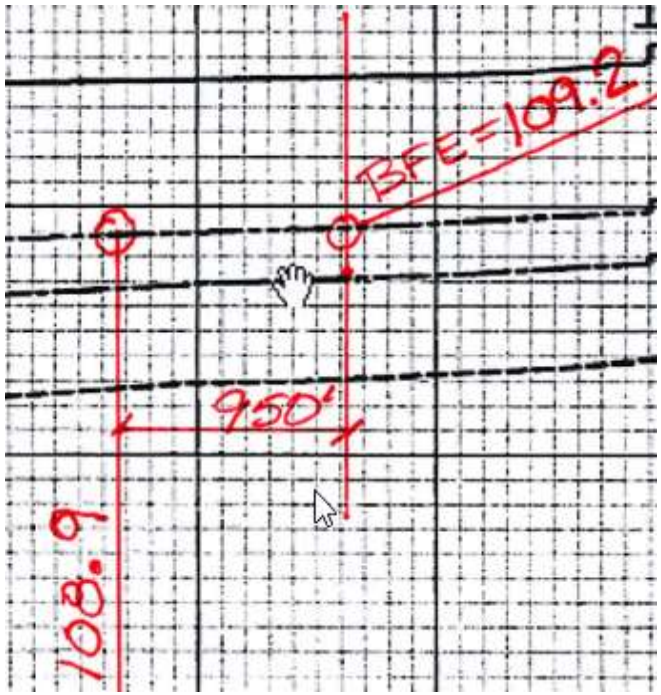
Flood Profile Provides Accurate BFE

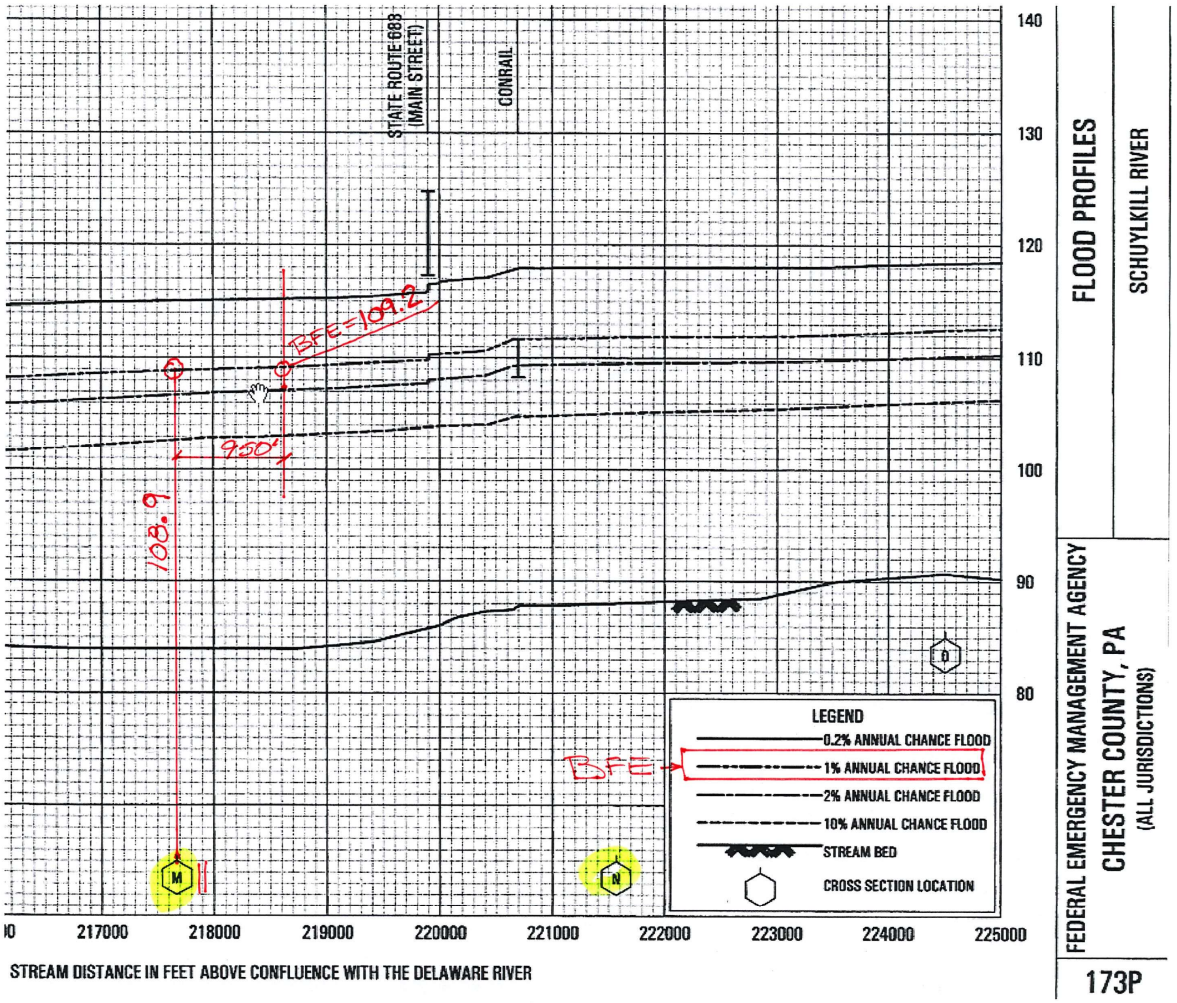
Scale distance from known cross-section to POI.

Pick 100-year or 1% chance flood.

Use nearest 0.1 foot.

(BFE = 109.2)





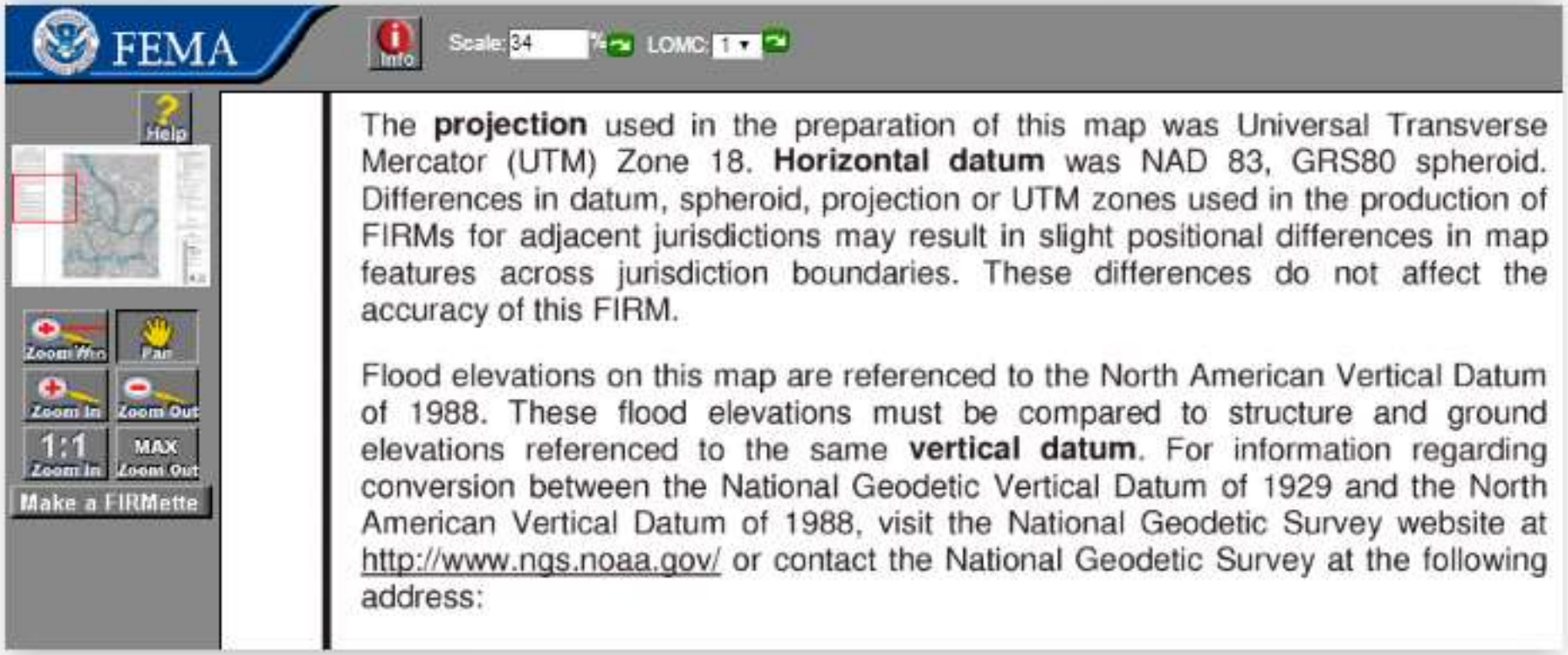
With BFE computed, we can now fill out the Elevation Certificate!, But first……

Elevation Certificate Client questionnaire

1. **Client contact information and location of property.**
2. **How many structures are to be surveyed (1 EC for each).**
3. **Approximate year constructed.**
4. **Does client have flood insurance?**
5. **What is the purpose of the Elevation Certificate? (For insurance rate quote, or to determine if the structure is in the Flood Plain?)**
   a) **If removal desired, LOMA is required. (Only FEMA can remove a structure or property from the flood plain. Most lenders require a LOMA in this case).**
   b) **No guarantee of removal, but Google Earth should be an indicator in AE zone.**
   c) **In Zone A stream, a more accurate survey is needed.**
6. **Look up the property on Google Earth and determine if the stream is Zone AE or Zone A.**
   a) **If in Zone A, no BFE is available. LOMA required.**

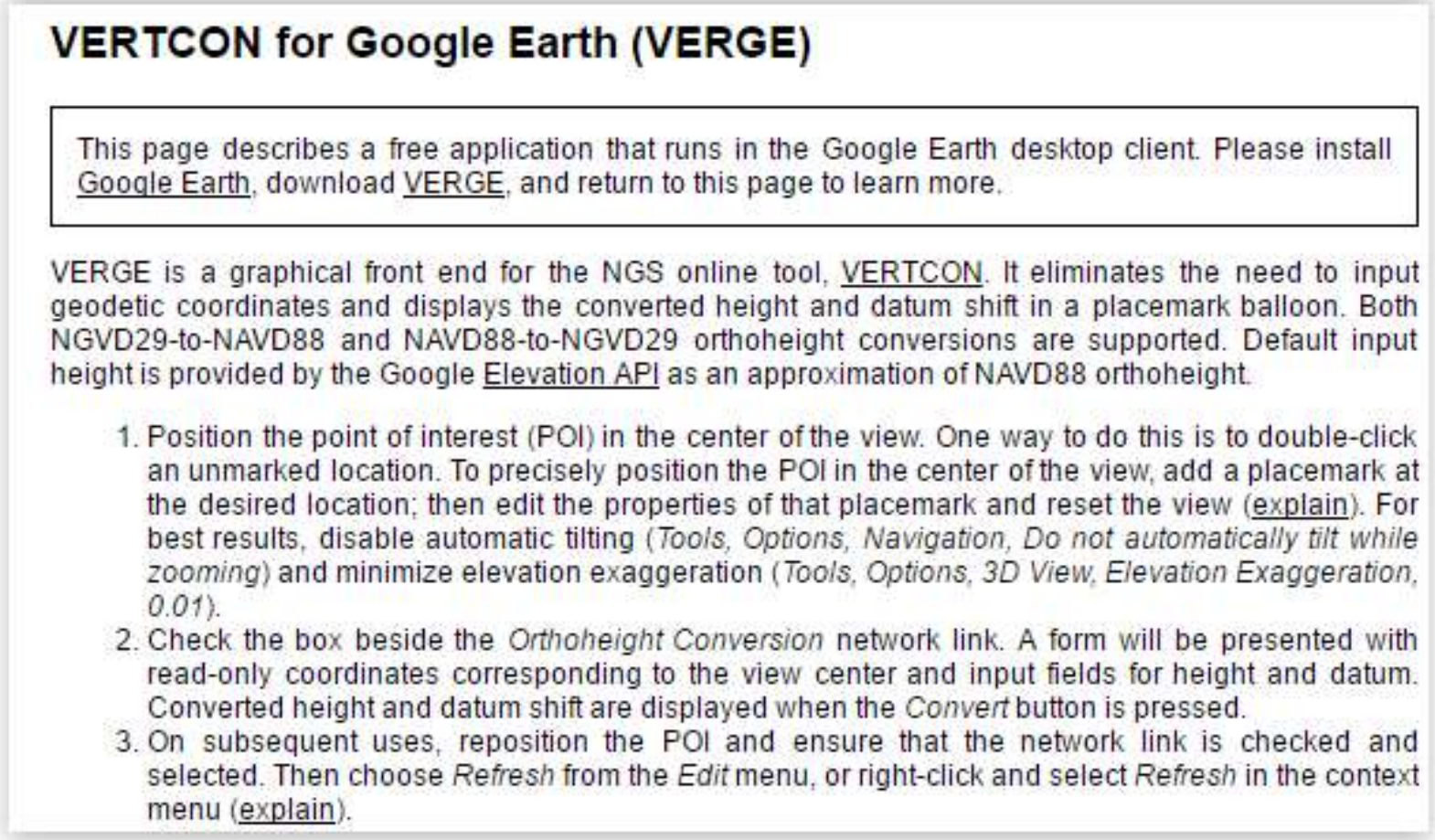
Elevation Certificate Survey requirements

1. **Survey MUST be tied to current FEMA datum. Firmette can be used to view the text at the left side of the FIRM to determine datum. Newer Flood Studies use NAVD 1988 datum. Older use NGVD 1929.**



Elevation Certificate Survey requirements

1. **Can convert one datum to another using VERTCON for Google Earth (VERGE).**



VERTCON for Google Earth (VERGE)

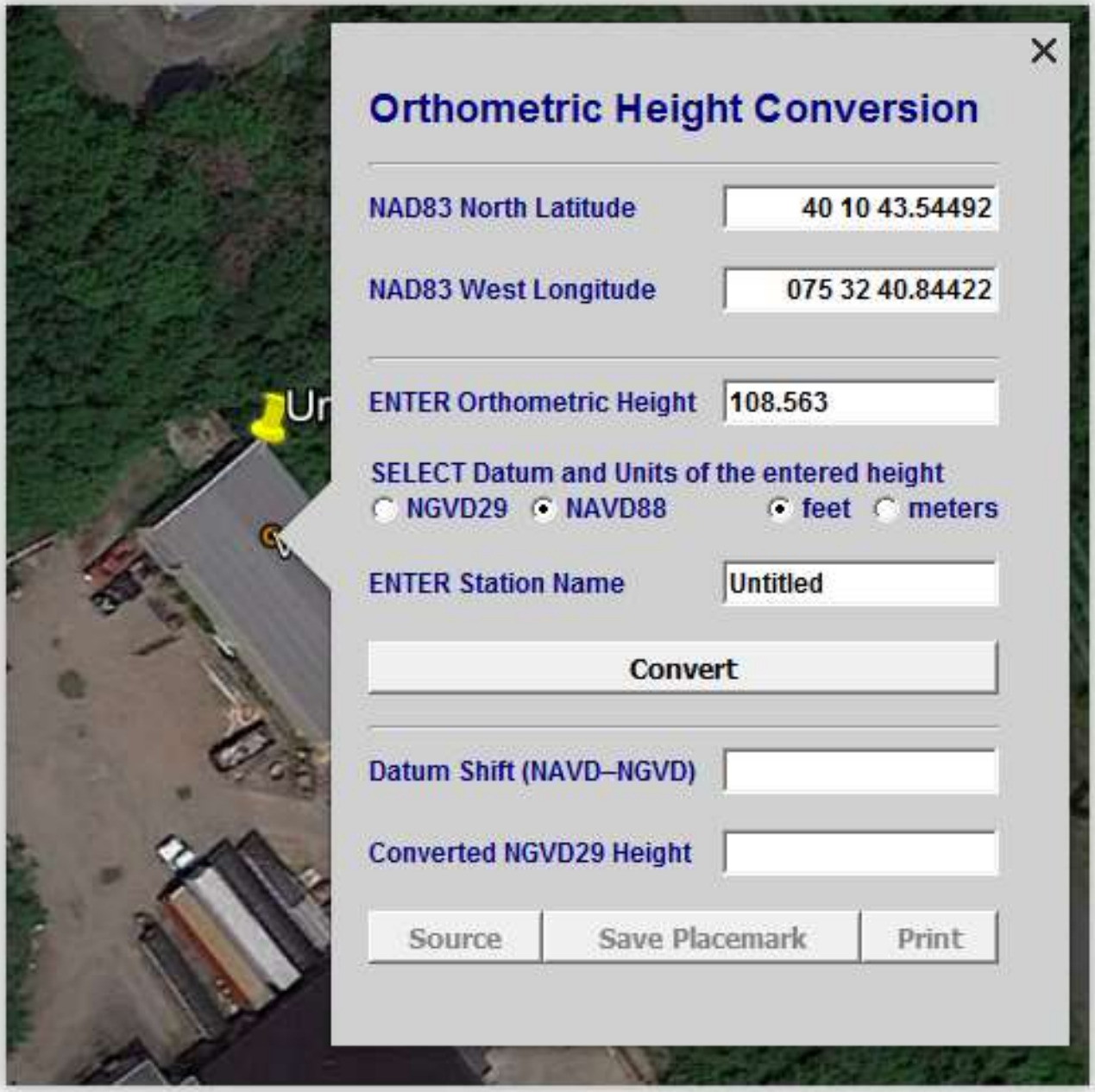
This page describes a free application that runs in the Google Earth desktop client. Please install Google Earth, download VERGE, and return to this page to learn more.

VERGE is a graphical front end for the NGS online tool, VERTCON. It eliminates the need to input geodetic coordinates and displays the converted height and datum shift in a placemark balloon. Both NGVD29-to-NAVD88 and NAVD88-to-NGVD29 orthoheight conversions are supported. Default input height is provided by the Google Elevation API as an approximation of NAVD88 orthoheight.

1. Position the point of interest (POI) in the center of the view. One way to do this is to double-click an unmarked location. To precisely position the POI in the center of the view, add a placemark at the desired location; then edit the properties of that placemark and reset the view (explain). For best results, disable automatic tilting (*Tools, Options, Navigation, Do not automatically tilt while zooming*) and minimize elevation exaggeration (*Tools, Options, 3D View, Elevation Exaggeration, 0.01*).
2. Check the box beside the *Orthoheight Conversion* network link. A form will be presented with read-only coordinates corresponding to the view center and input fields for height and datum. Converted height and datum shift are displayed when the *Convert* button is pressed.
3. On subsequent uses, reposition the POI and ensure that the network link is checked and selected. Then choose *Refresh* from the *Edit* menu, or right-click and select *Refresh* in the context menu (explain).

Datum Conversion with VERGE

Can convert one datum to another using VERTCON for Google Earth (VERGE).



Elevation Certificate Survey requirements – Office data

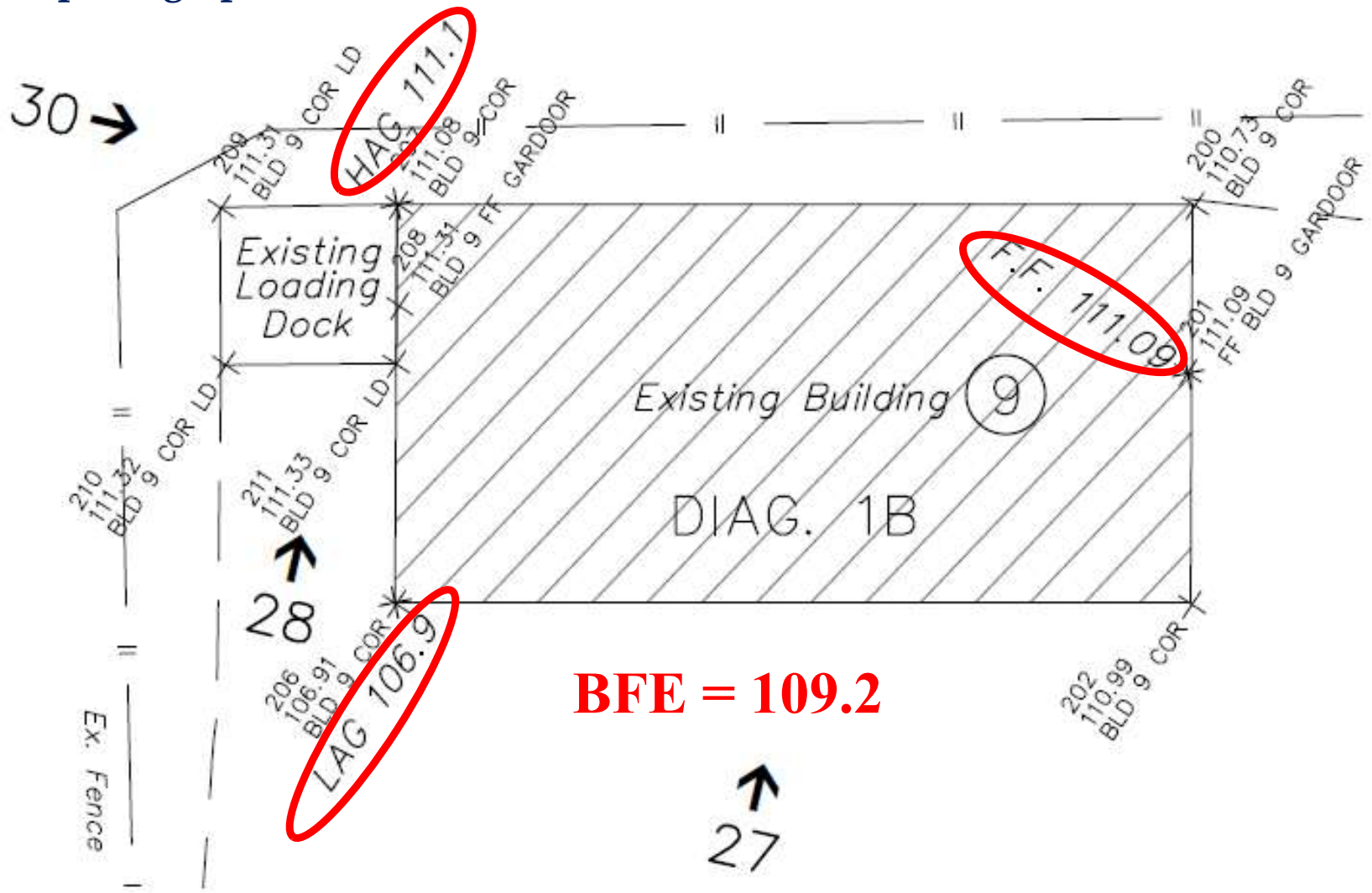
1. **Tax map and deed to describe property.**
2. **Copy of subdivision plan if available (for LOMA).**
3. **Google Earth data:**
   a) **Latitude and Longitude (set with tools, options, 3-D view to Decimal degrees. (Center front of house).**
   b) **Cross-section location and elevation of BFE.**
   c) **Distance from cross-section to POI (either upstream or downstream), using ruler tool.**

Elevation Certificate Survey requirements – Field data

a) **Measure basement or enclosure dimensions (provide sketch).**
b) **If basement is multi-level, measure elevations of each level.**
c) **Locate elevations of equipment in basement (furnace, water heater, etc.). Take photos.**
d) **Locate and measure any permanent flood openings within 1.0 foot above adjacent grade. (Windows don't count). If engineered flood vents are used, note and take photos.**
e) **If attached garage, locate floor elevation.**
f) **For main structure, locate each floor elevation (included sunken living rooms, etc.)**
g) **Locate buildings and grades around buildings, capturing lowest and highest adjacent grades.**
h) **Locate bottom of steps lowest adjacent grade for attached deck including structural support.**
i) **Lots of photos inside and out. Outside need front, rear, left and right. Attached garage, deck or stairs. Flood openings.**

Elevation Certificate Survey Field Data Plot

1. **From survey, plot building, showing spot elevations.**
2. **Calculate Lowest floor Elevation, LAG and HAG.**
3. **Indicate locations of any other elevations reported in Section C2.**
4. **Indicate Building Diagram number.**
5. **Show photograph locations.**



FEMA ELEVATION CERTIFICATE
UPDATED 2023

Released: 9/27/2023
FEMA Form 086-0-33 (12/19)
Expiration - 6/30/2026

Note: Typically FEMA does not always replace the form on the expiration date. It is good practice to check the FEMA website to determine the most current version. Generally, the current version of the EC can be used until replacement is available and for some time after the replacement is published.

FEMA

FEMA ELEVATION CERTIFICATE
UPDATED 2023

Released: 9/27/2023
FEMA Form 086-0-33 (12/19)
Expiration - 6/30/2026

May have download issues with FEMA's copy.
Do Google Search for **PEMA** Elevation Certificate and download the form (PDF)
https://www.pa.gov/content/dam/copapwp-pagov/en/pema/documents/floodplain-management/documents/elevation%20certificate.pdf?appId=aemshell

FEMA

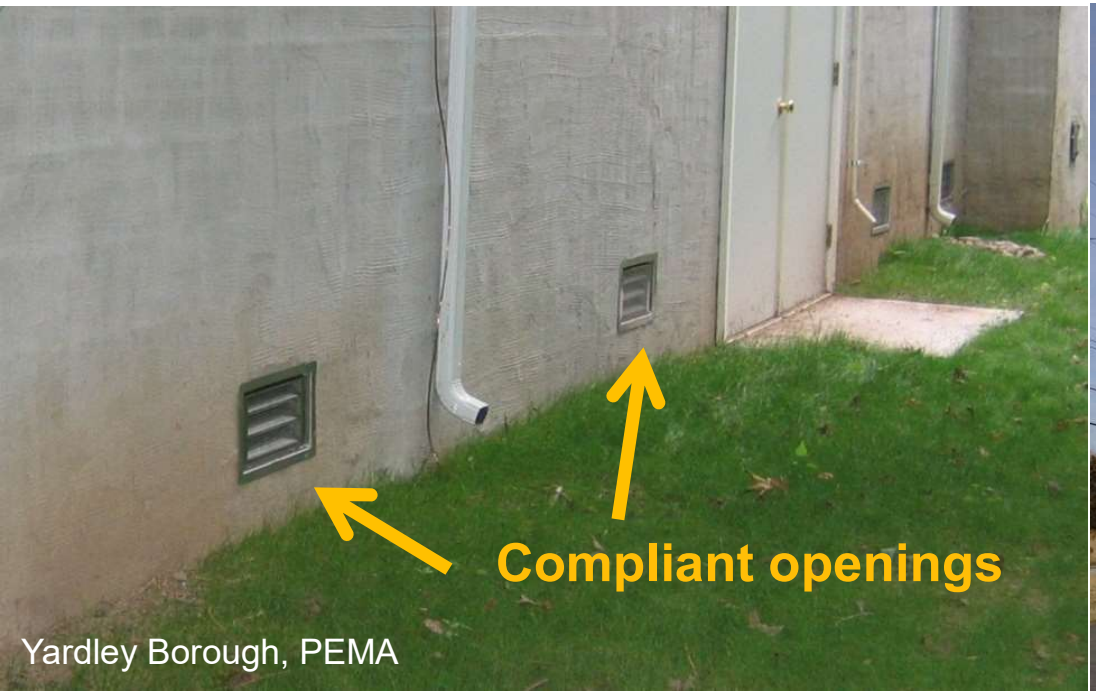
Enclosures Below BFE

A Zones

- Parking, building access, and limited storage
- Openings no more than 1 foot above grade
- One **square inch** of opening for each **square foot** of enclosed space

V Zones

- Parking, building access, and limited storage
- **Free of obstruction**, or use of breakaway walls, open lattice, or louvers



Yardley Borough, PEMA


Town of Bowers, FEMA Region III

The EC As a Compliance Tool - Page 3

- Compliance considerations (LAG, BFE, lowest floor, mechanicals, openings)
- Insurance rating (insurance and floodplain management do not always align)

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. Complete Items C2.a–h below according to the Building Diagram specified in Item A7. In Puerto Rico only, enter meters.
Benchmark Utilized: _____ Vertical Datum: _____

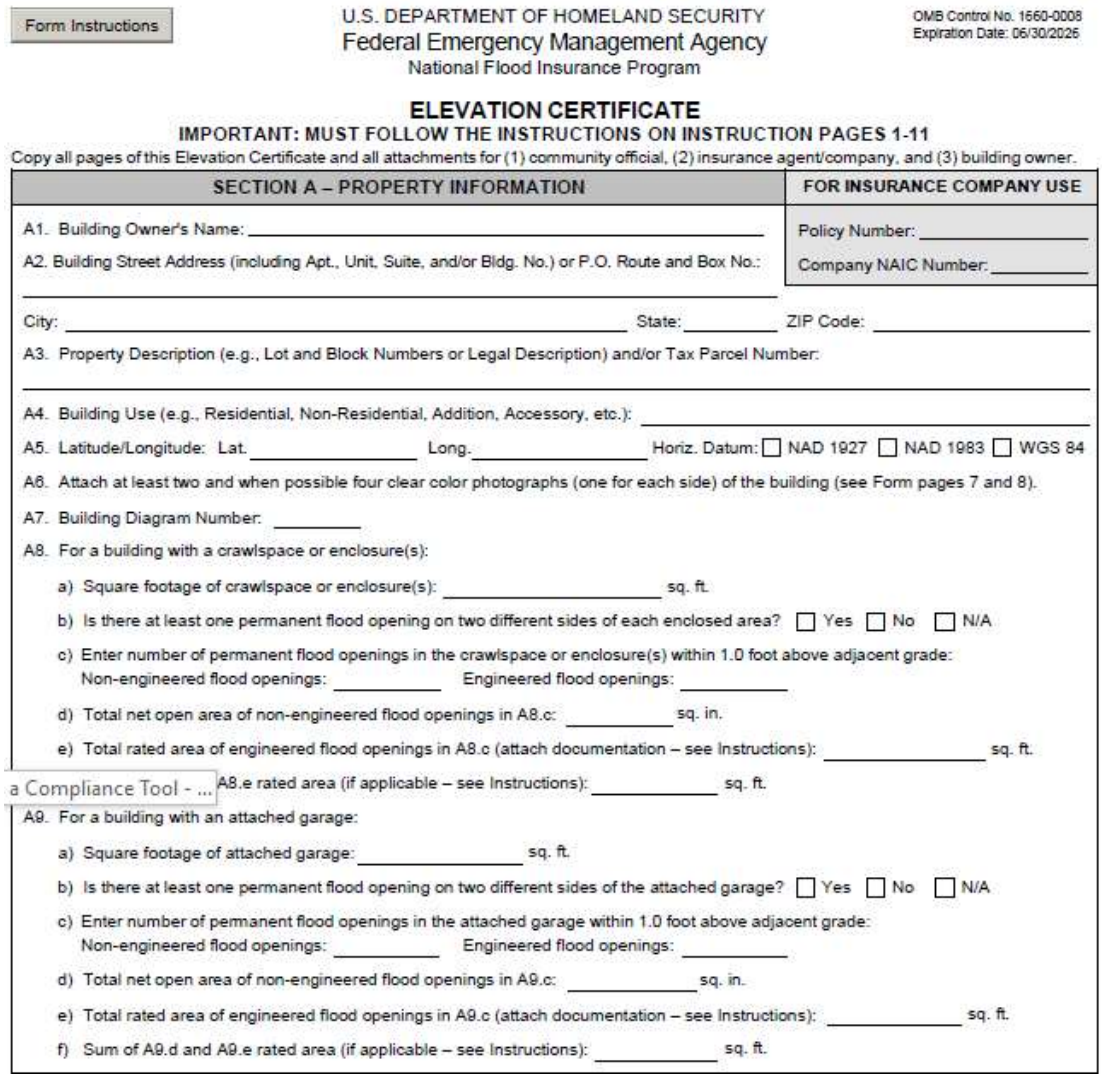
Indicate elevation datum used for the elevations in items a) through h) below.
☐ NGVD 1929 ☐ NAVD 1988 ☐ Other: _____

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

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

FEMA

Elevation Certificate



Form Instructions

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

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

ELEVATION CERTIFICATE
IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

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

SECTION A – PROPERTY INFORMATION	FOR INSURANCE COMPANY USE
A1. Building Owner's Name: _____	Policy Number: _____
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____	Company NAIC Number: _____

City: _____ State: _____ ZIP Code: _____

A3. Property Description (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number: _____

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

A5. Latitude/Longitude: Lat. _____ Long. _____ Horiz. Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84

A6. Attach at least two and when possible four clear color photographs (one for each side) of the building (see Form pages 7 and 8).

A7. Building Diagram Number: _____

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

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

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

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

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

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

a Compliance Tool - ... A8.e rated area (if applicable – see Instructions): _____ sq. ft.

A9. For a building with an attached garage:

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

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

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

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

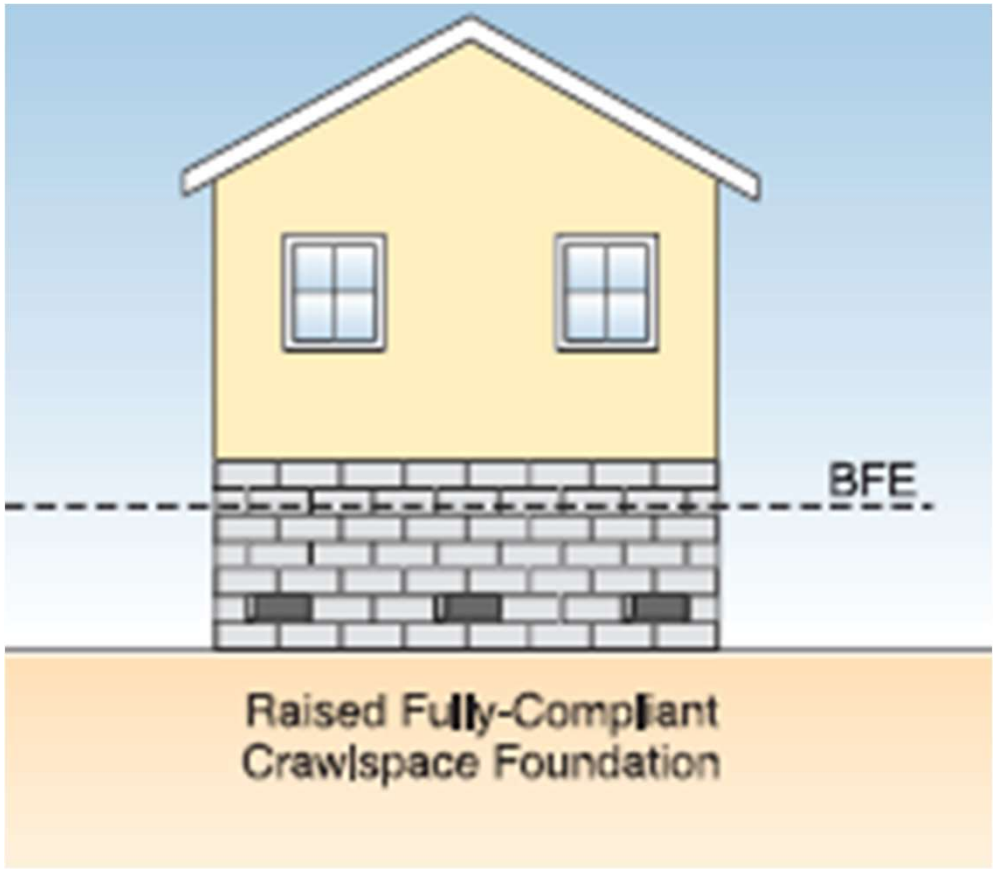
e) Total rated area of engineered flood openings in A9.c (attach documentation – see Instructions): _____ sq. ft.

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

FEMA

- Completed by licensed professionals
- Available for download on the FEMA library
- The form has been modified and expanded upon over time
  - Clarified Instructions
  - Additional building diagrams added
  - Openings and other compliance information included

Obtaining and Maintaining Data



- Communities are required to obtain and maintain elevation data in perpetuity
- Elevation Certificates are the **best tool** to record elevation data for NFIP compliance
- Use of the Elevation Certificates is not required to record elevations

FEMA

Structure Definition

Floodplain Management:

a walled and roofed building, including a gas or liquid storage tank, that is principally above ground and a manufactured home.

Image: Tinicum Twp, Bucks County, PA (FEMA Region III)

FEMA

Insurance:

1. A building with two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site;
2. A manufactured home built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation); or
3. A travel trailer without wheels, built on a chassis and affixed to a permanent foundation

NOTE: does not mean a recreational vehicle or a park trailer or other similar vehicle, except as described in paragraph (3) of this definition, or a gas or liquid storage tank.

Section A – Property Information

Form Instructions

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

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

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A1. Building Owner's Name: _____	Policy Number: _____
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____	Company NAIC Number: _____

City: _____ State: _____ ZIP Code: _____

A3. Property Description (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number: _____

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

A5. Latitude/Longitude: Lat. _____ Long. _____ Horiz. Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84

A6. Attach at least two and when possible four clear color photographs (one for each side) of the building (see Form pages 7 and 8).

A7. Building Diagram Number: _____

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

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

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

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

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

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

a Compliance Tool - ... A8.e rated area (if applicable – see Instructions): _____ sq. ft.

A9. For a building with an attached garage:

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

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

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

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

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

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

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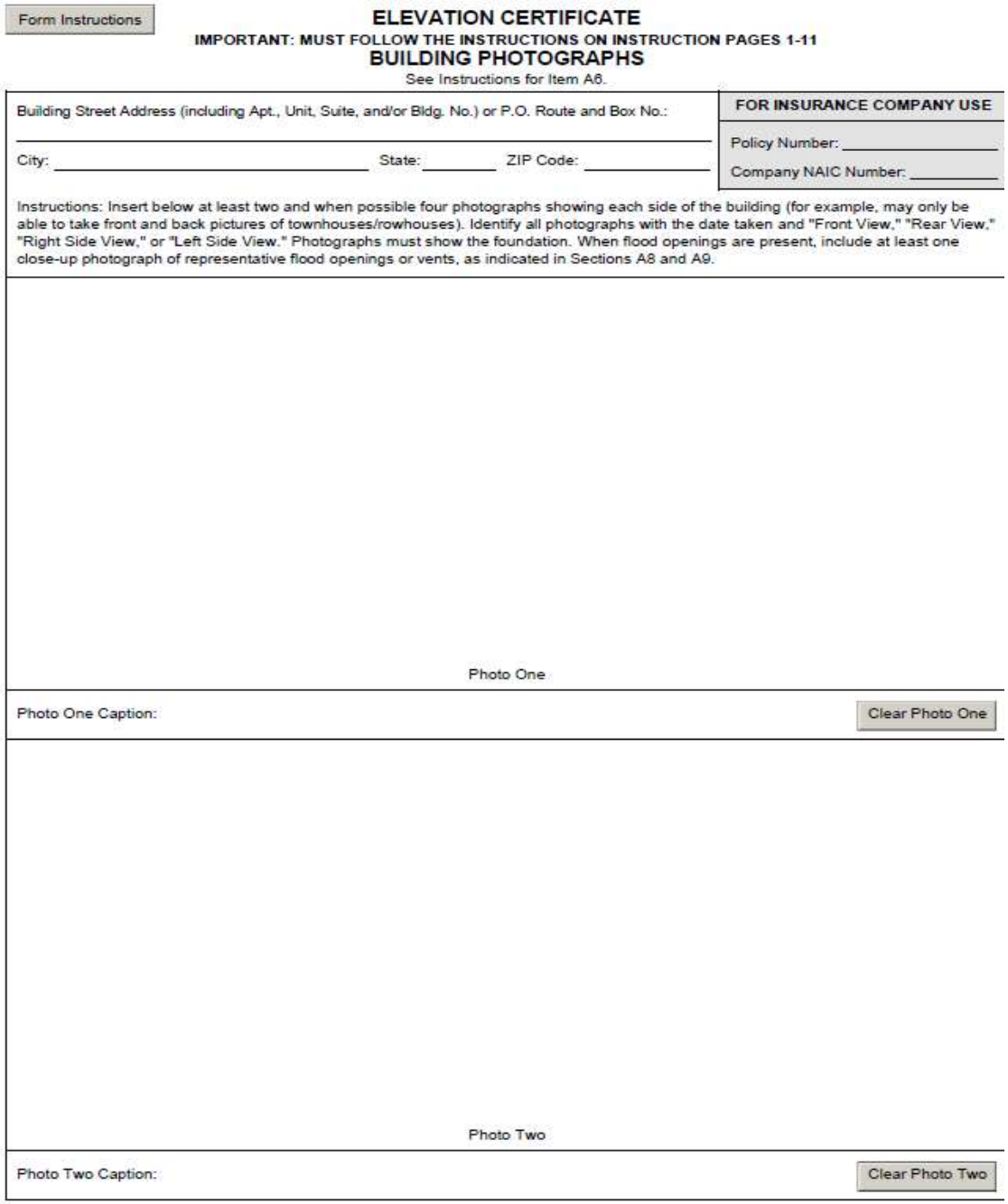
Building Photographs – Page 7

- Photographs help to verify correct building diagram was selected
- Photographs showing key elements, such as flood openings will ensure proper rating
- 4 Photos minimum, front, rear, left and right side. Flood openings and basement photos.
- Equipment servicing building.
- Attached garage, deck or patio.



Form Instructions

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

BUILDING PHOTOGRAPHS

See Instructions for Item A6.

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

City: State: ZIP Code:

FOR INSURANCE COMPANY USE

Policy Number:

Company NAIC Number:

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

Photo One

Photo One Caption:

Clear Photo One

Photo Two

Photo Two Caption:

Clear Photo Two

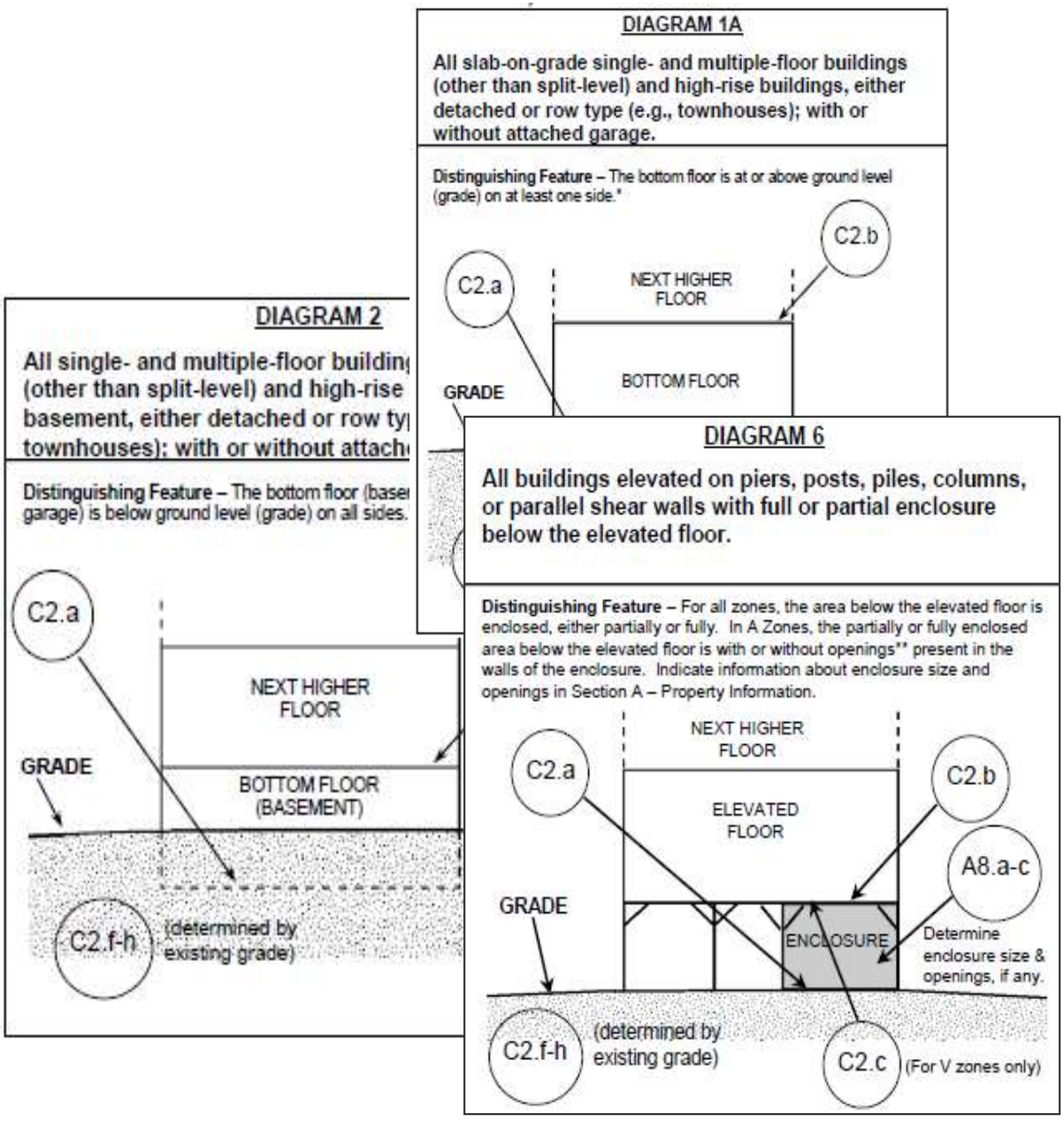
FEMA Form FF-206-FY-22-152 (formerly 086-0-33) (8/23)

Form Page 7 of 8

FEMA

Building Diagrams- Section A7

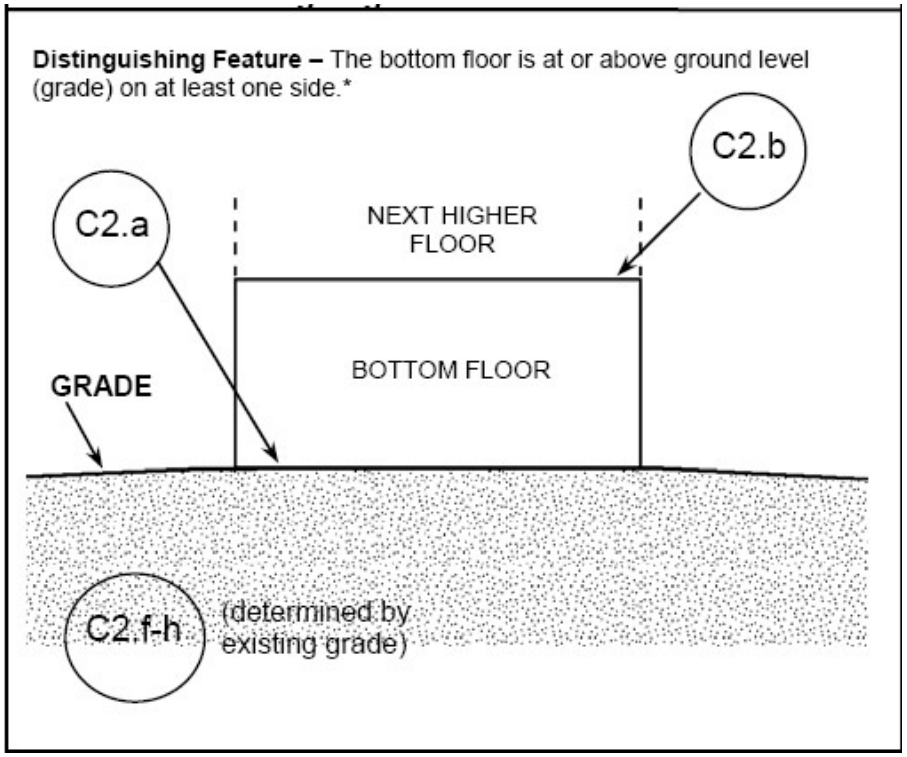
- **Three basic types of construction**
  - Slab on grade or stemwall
  - Basement
  - Elevated (with or without enclosure)



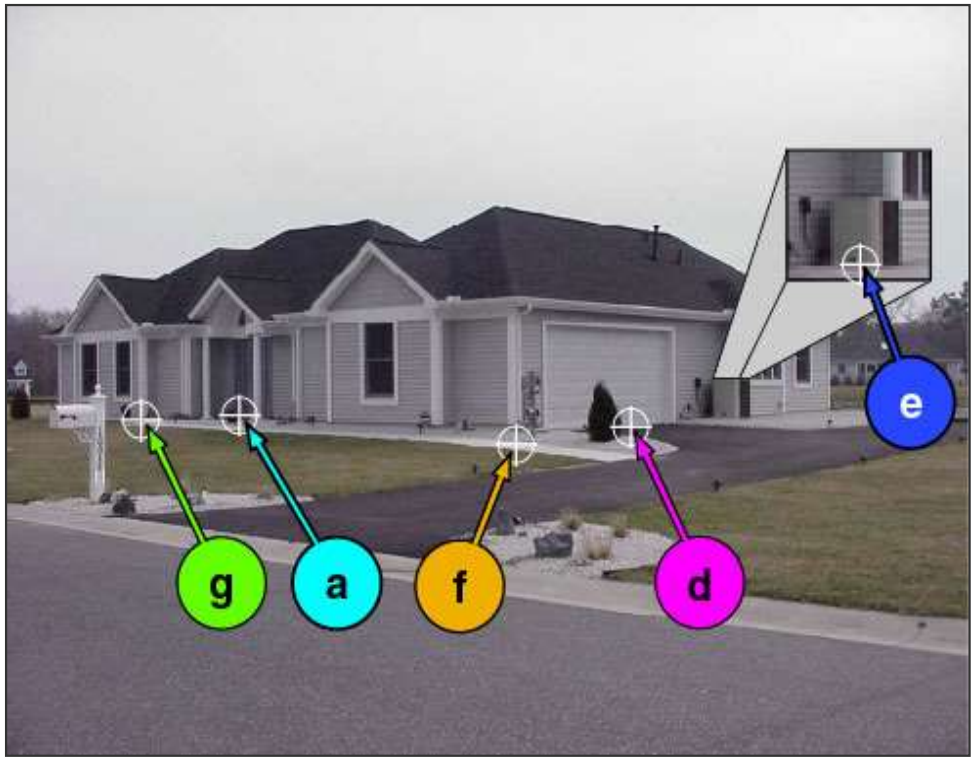
FEMA

Building Diagram 1A

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



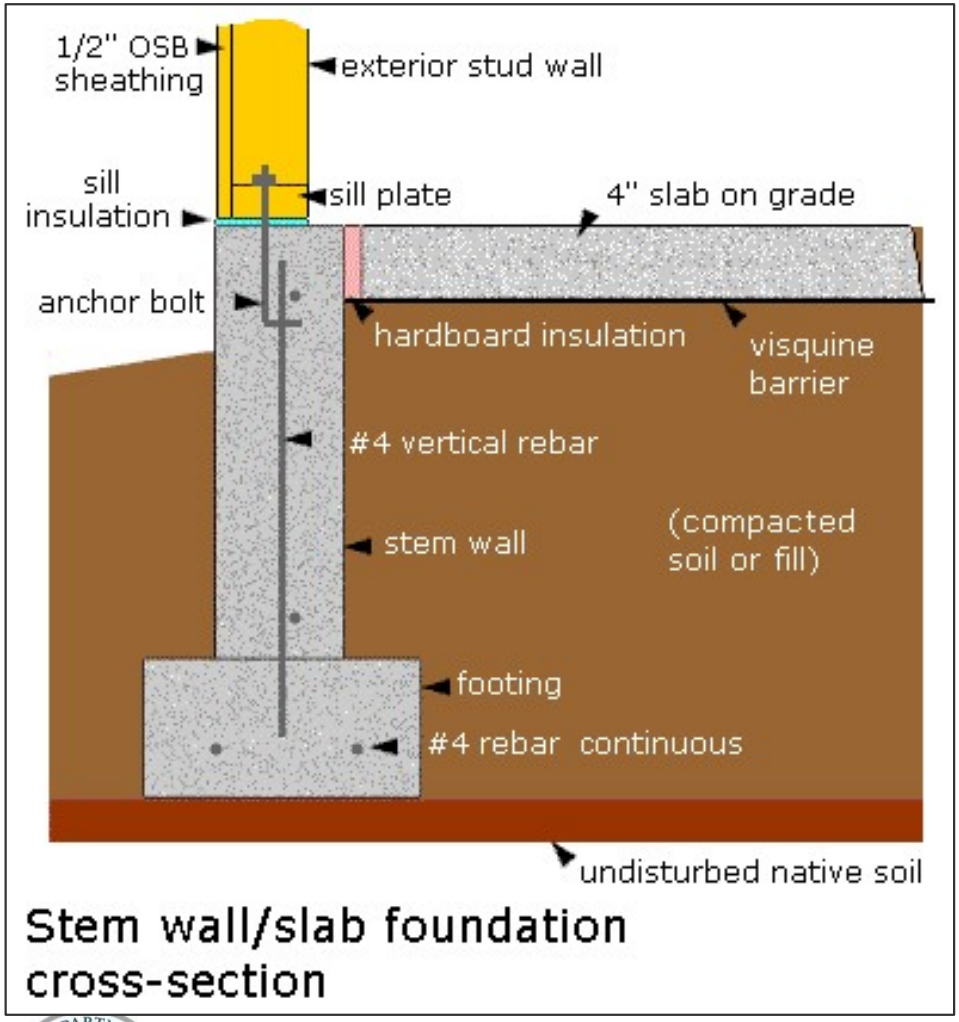
SLAB ON GRADE BUILDING WITH GARAGE



FEMA

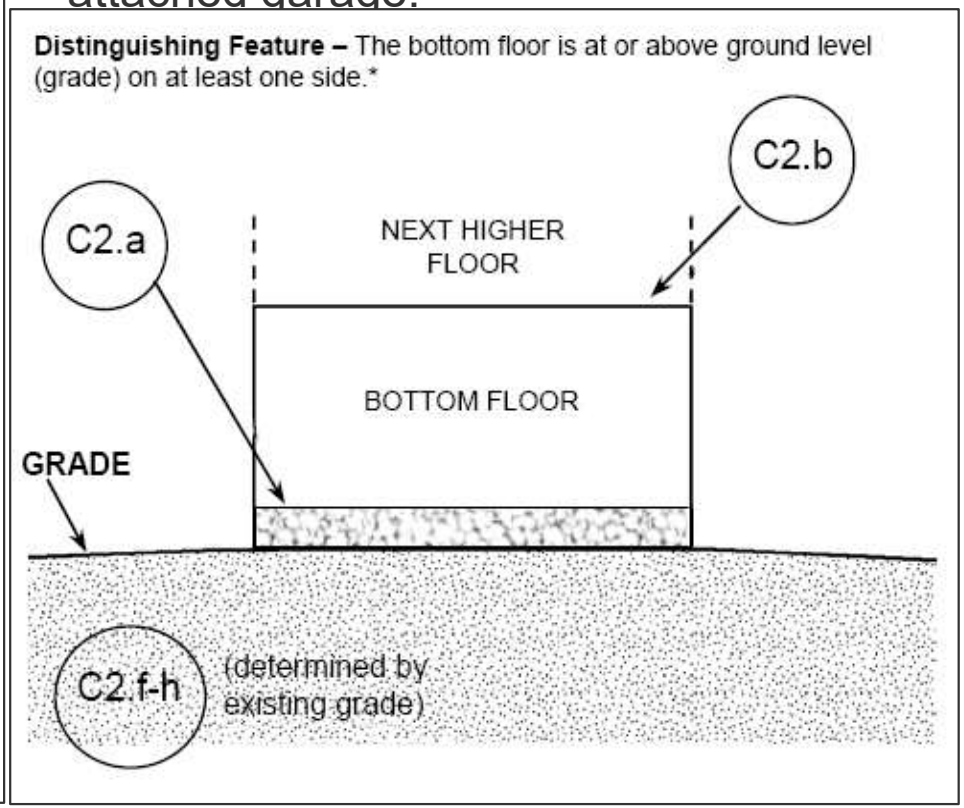
Building Diagram 1B

SLAB ON STEM WALL FOUNDATION



Stem wall/slab foundation cross-section

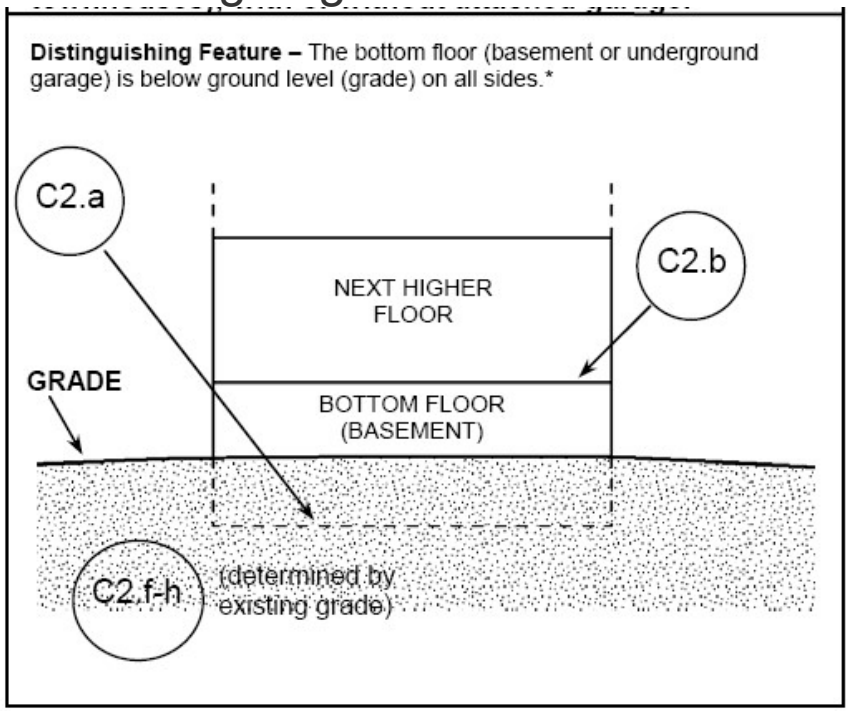
All **raised-slab-on-grade or slab-on-stem-wall-with-fill** single- and multiple-floor buildings (other than split-level), either detached or row type with or without attached garage.



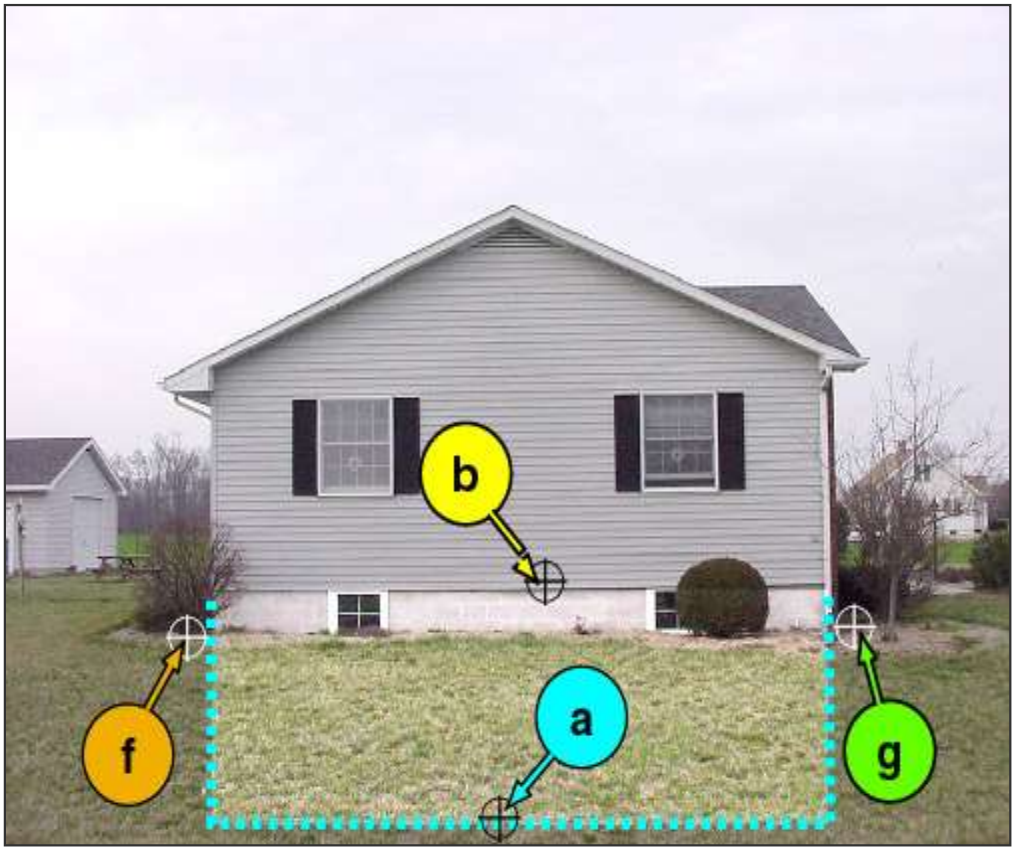
FEMA

Building Diagram 2A

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



TWO-STORY BUILDING WITH BASEMENT, WITHOUT ATTACHED GARAGE

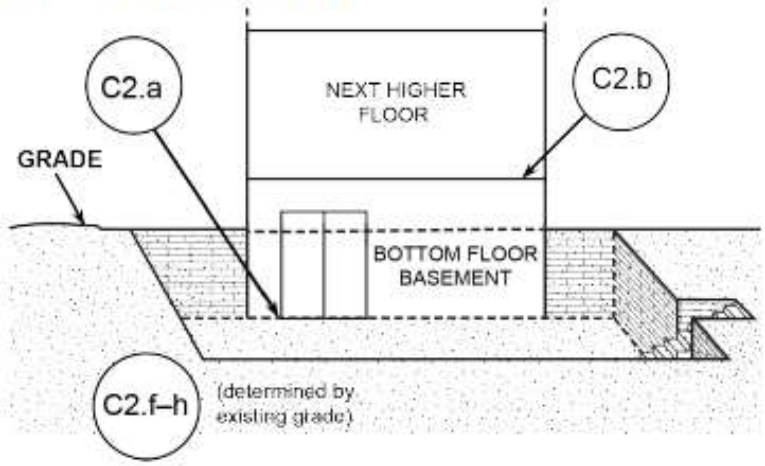


FEMA

Building Diagram 2B

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

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

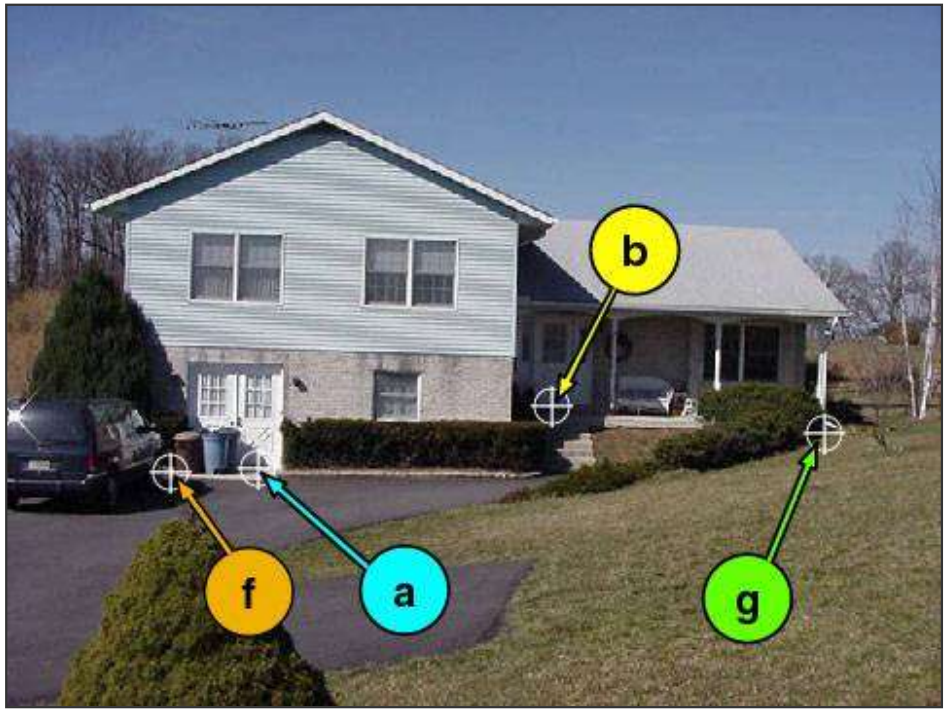


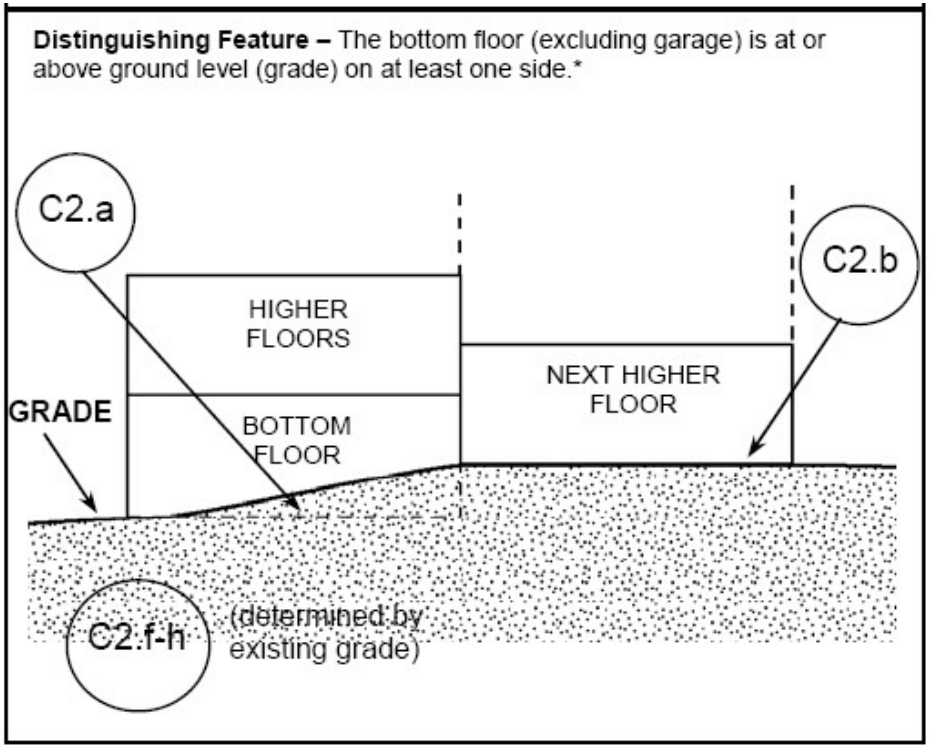
FEMA

Building Diagram 3

SLAB-ON-GRADE, SPLIT-LEVEL BUILDING WITHOUT ATTACHED GARAGE

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

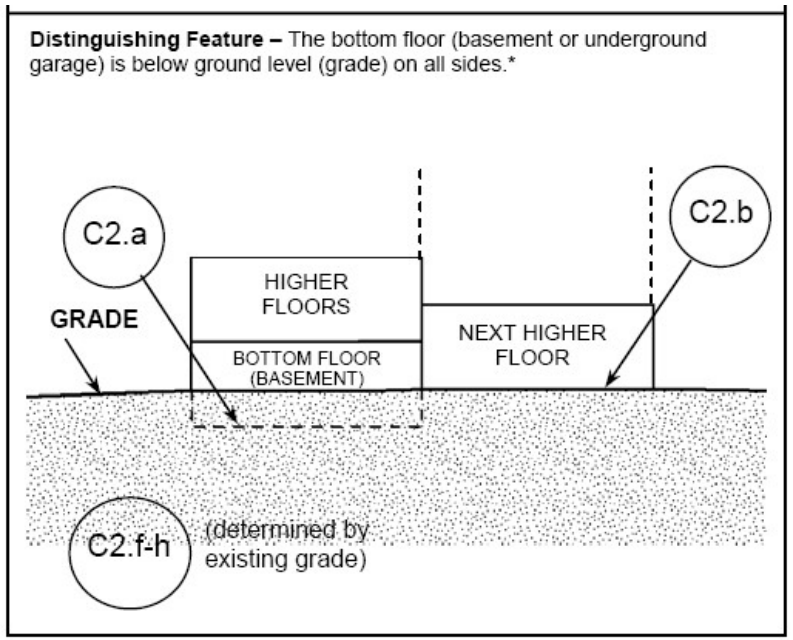




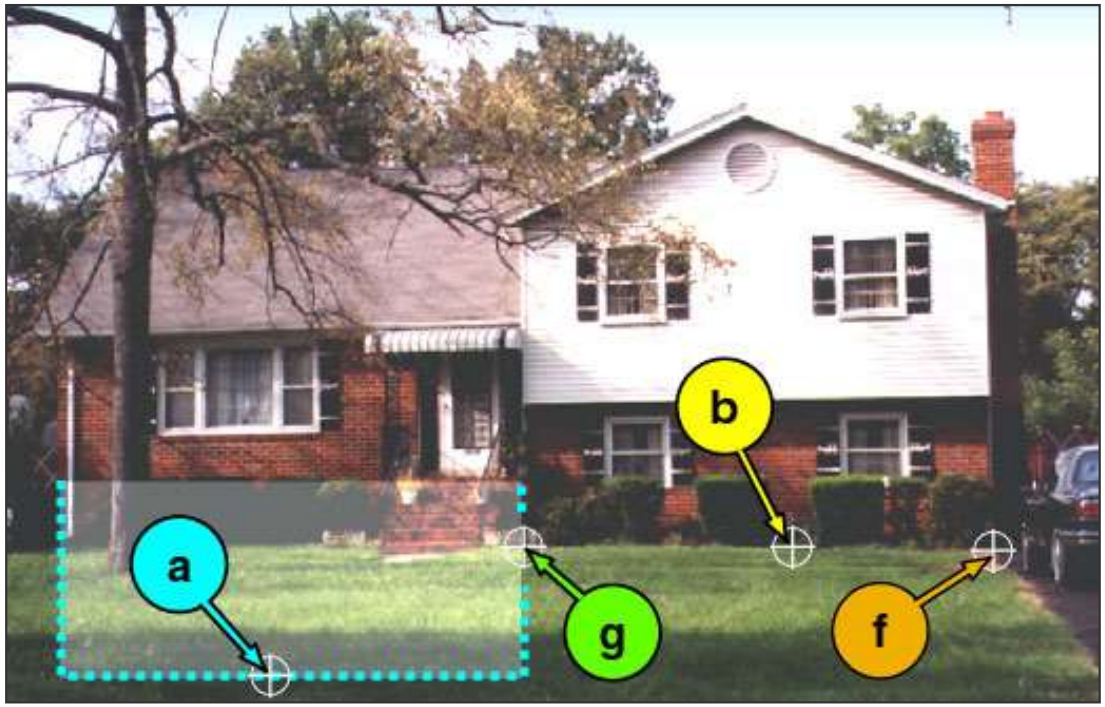
FEMA

Building Diagram 4

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



SPLIT-LEVEL BUILDING WITHOUT ATTACHED GARAGE



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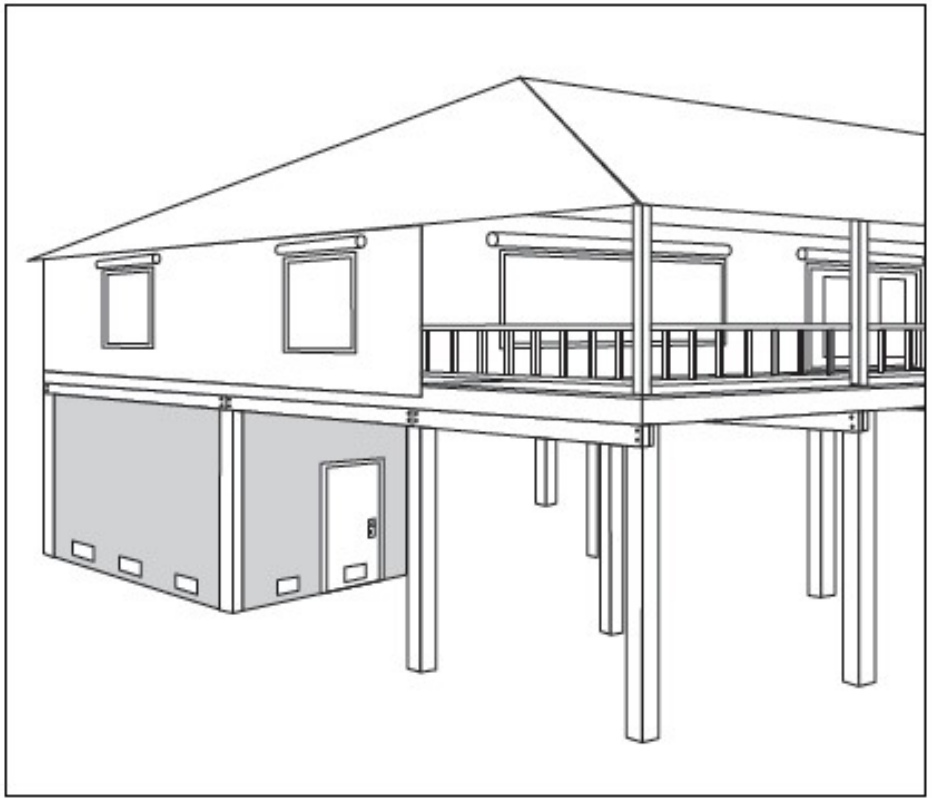
Elevated Structures

- Can exist with or without enclosures

Breakaways Walls image: http://www.engexp.com/home/wp-content/uploads/DSC01983.jpg

Requirements for Enclosures



- Spaces below elevated buildings can be used only for **building access, parking, and limited storage**.
- Enclosures must remain unfinished
- No mechanical, electrical, or plumbing equipment is to be installed below the BFE.
  - **V Zones** must have breakaway walls
  - **A Zones** must be built with flood-resistant materials and have adequate openings

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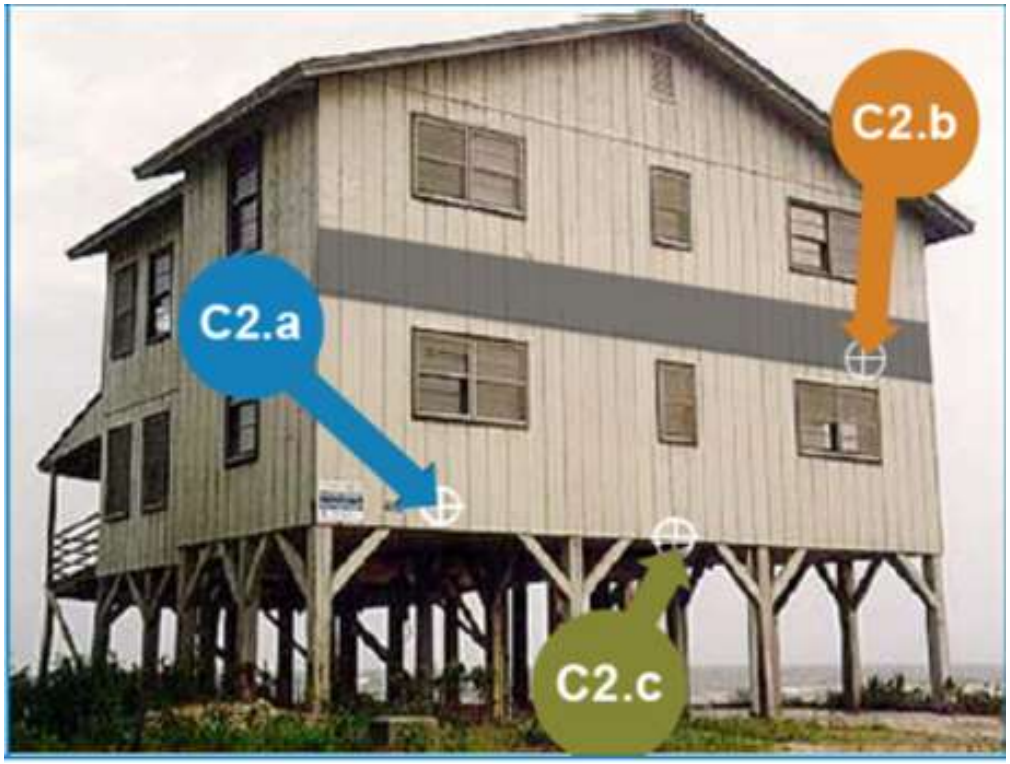
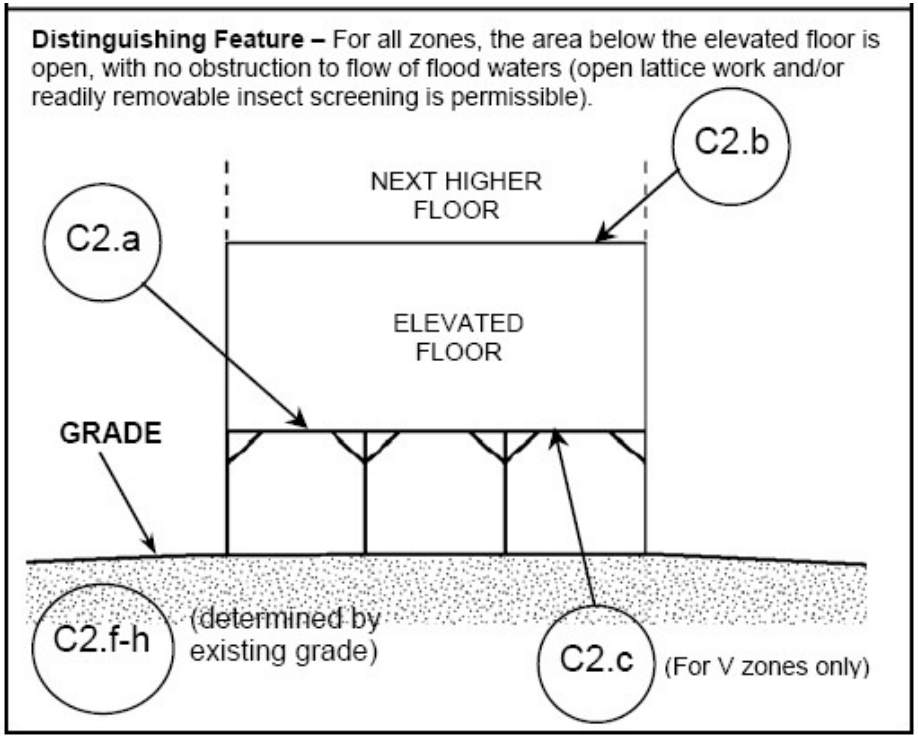
Building Diagram 5

HOME ELEVATED ON PIER FOUNDATION



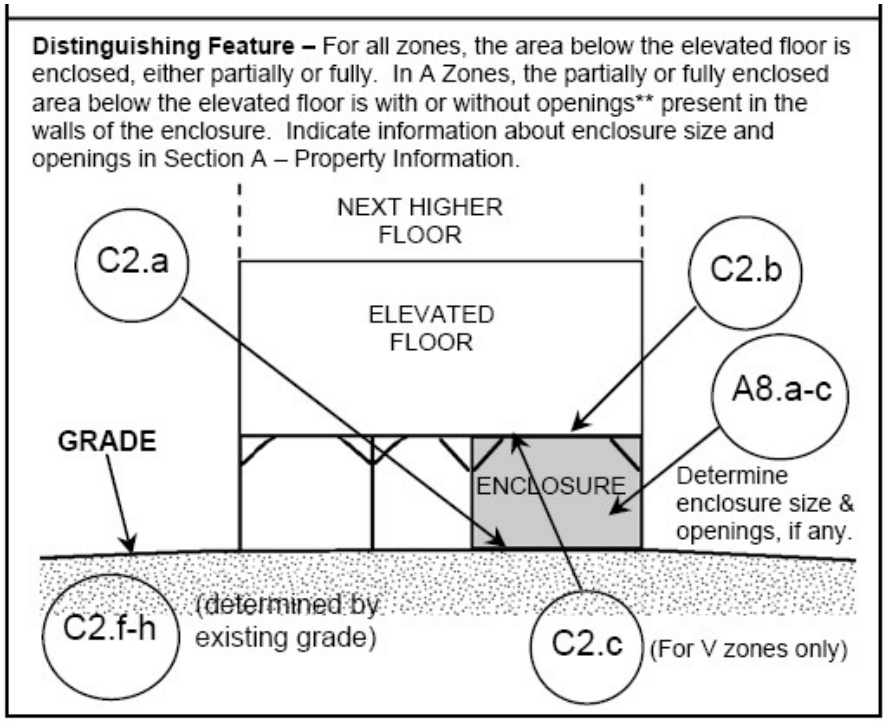
All buildings **elevated on piers, posts, piles, columns, or parallel shear walls**. No obstructions below the elevated floor.



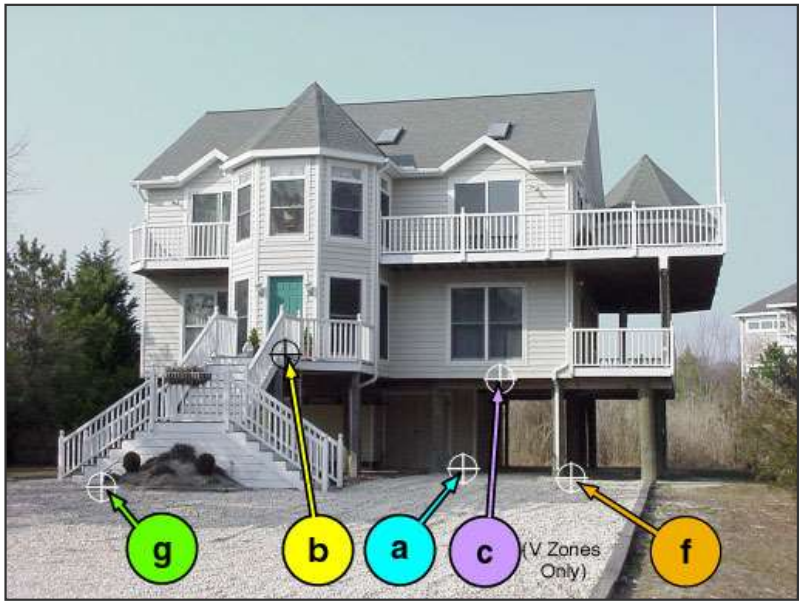
FEMA

Building Diagram 6

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



BUILDINGS ELEVATED WITH PARTIAL ENCLOSURE



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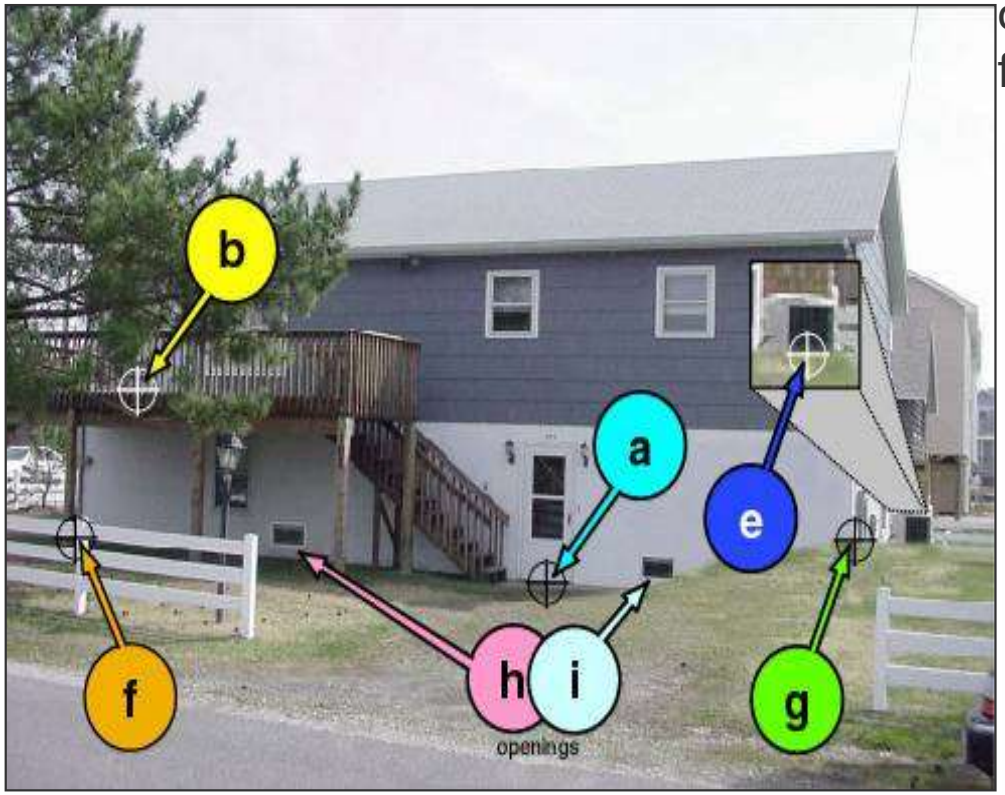
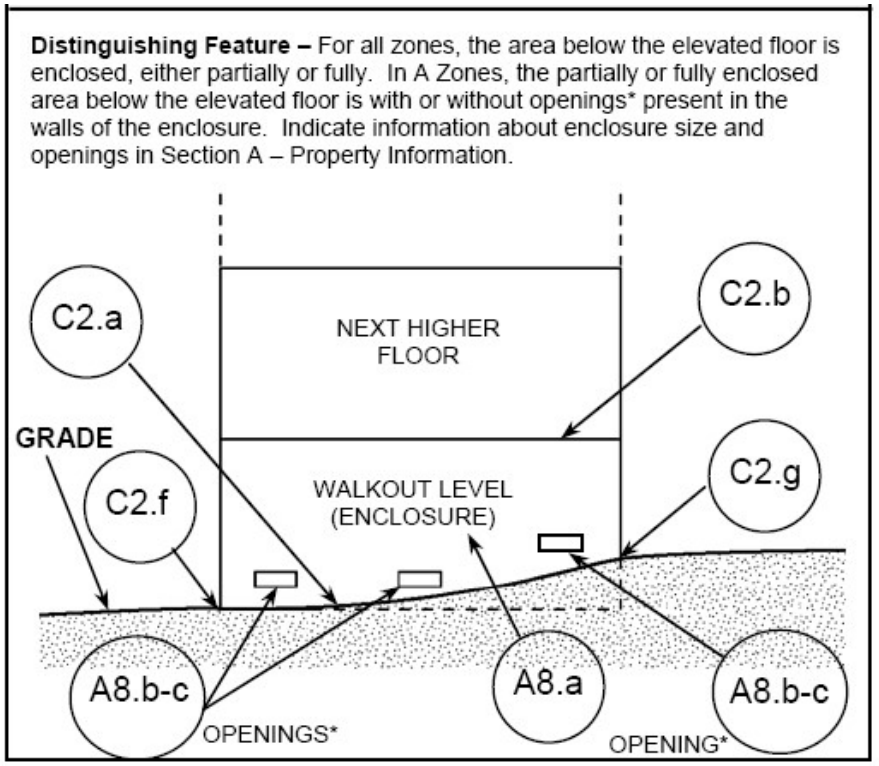
Building Diagram 7

BUILDING ELEVATED ON FULL-STORY FOUNDATION WALLS WITH A FULLY ENCLOSED AREA BELOW THE ELEVATED FLOOR.

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.

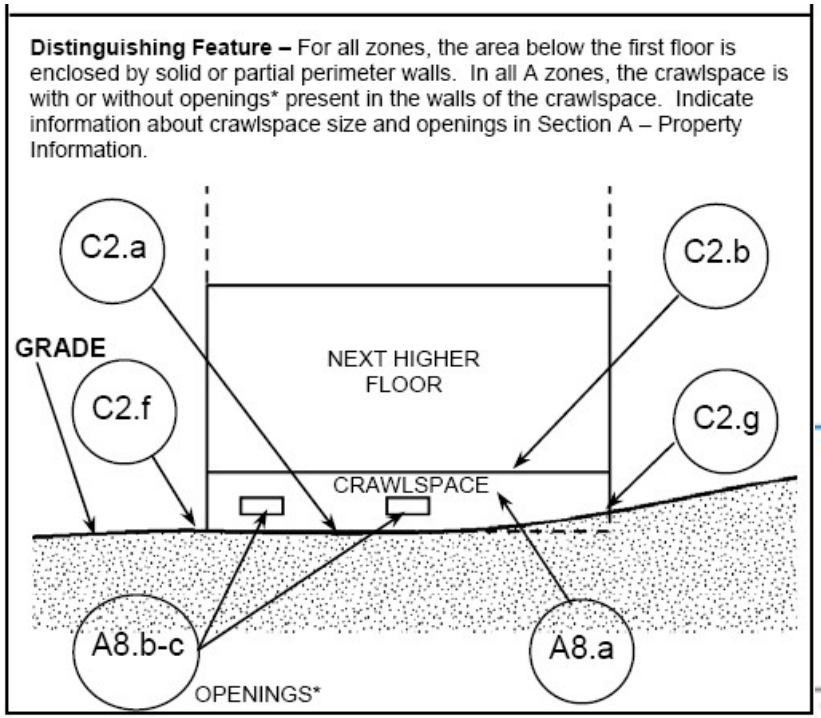




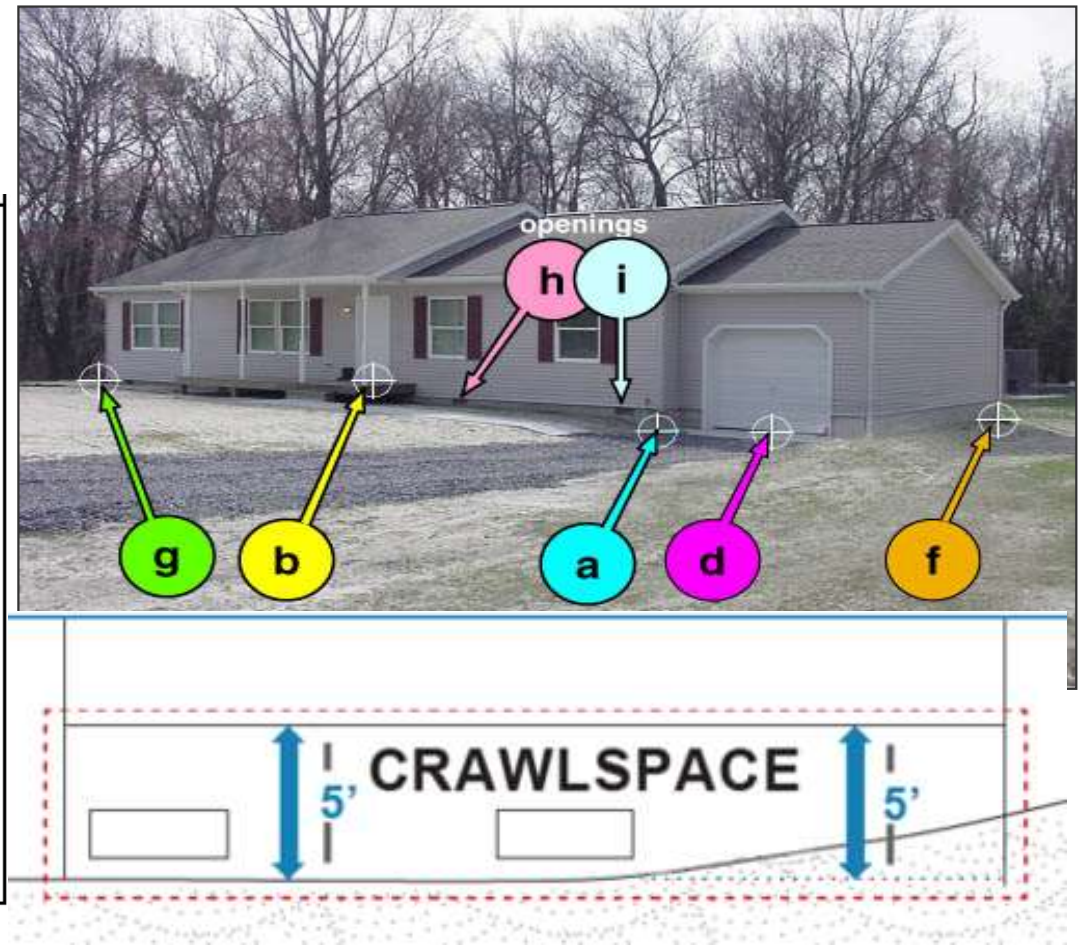
THIS IS AN EXAMPLE OF A "WALKOUT" AND IS NOT A BASEMENT.

Building 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.



ONE-STORY BUILDING ON CRAWL SPACE WITH ATTACHED GARAGE

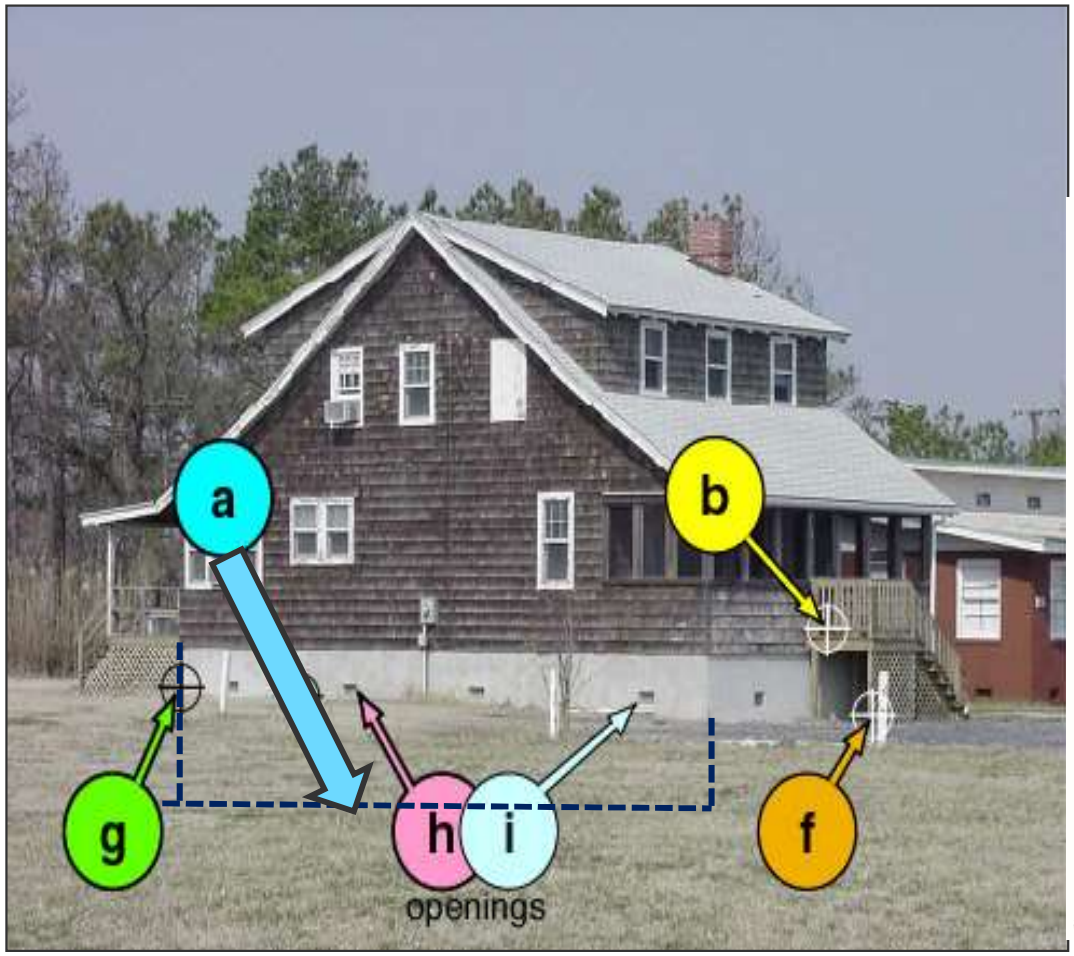


Crawlspace is defined as no more than **5** feet to next higher floor. Otherwise it is a basement (Use diagram 2)

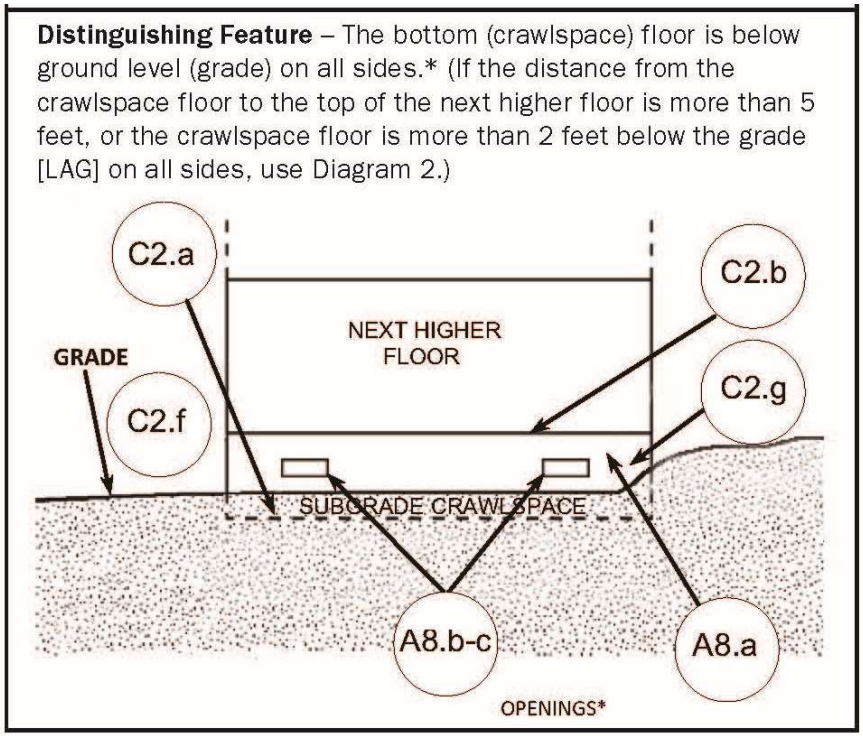
FEMA

Building Diagram 9

MULTI-LEVEL BUILDING ELEVATED ON A SUB-GRADE CRAWL SPACE



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



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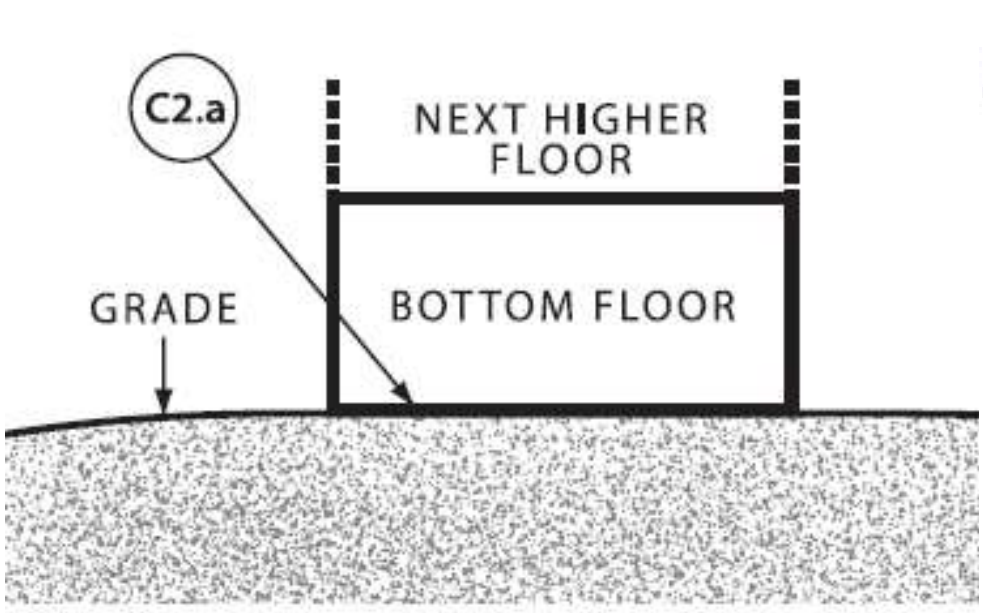
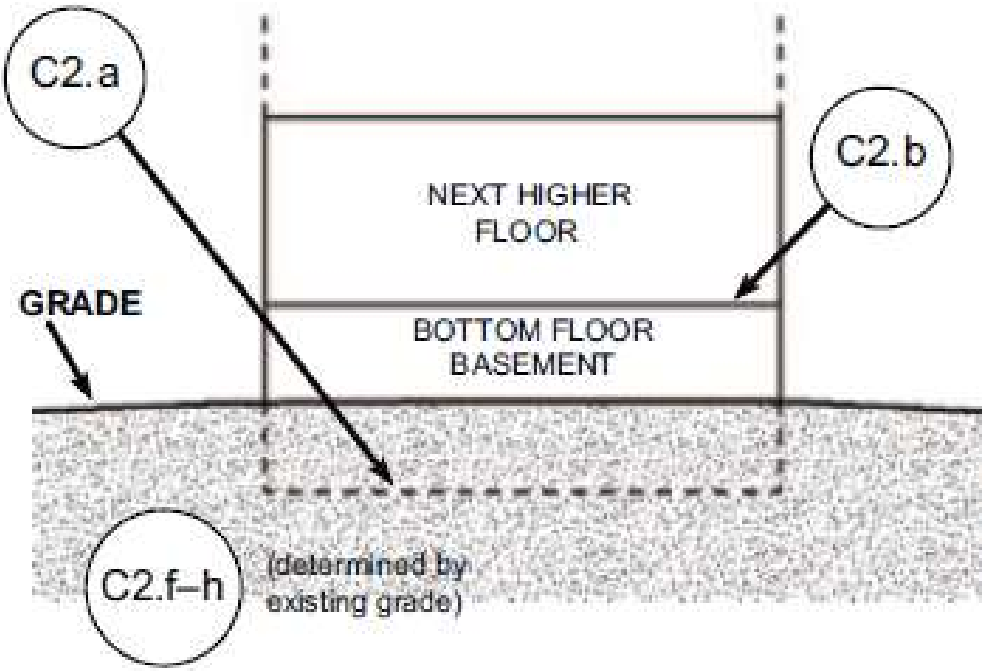
Lowest Floor – A Zone

Lowest Floor – Lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor





FEMA

Section A – Property Information

SECTION A – PROPERTY INFORMATION	FOR INSURANCE COMPANY USE
A1. Building Owner's Name: _____	Policy Number: _____
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____	Company NAIC Number: _____

City: _____ State: _____ ZIP Code: _____

A3. Property Description (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number:

_____

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

A5. Latitude/Longitude: Lat. _____ Long. _____ Horiz. Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84

A6. Attach at least two and when possible four clear color photographs (one for each side) of the building (see Form pages 7 and 8).

A7. Building Diagram Number: _____

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

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

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

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

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

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

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

A9. For a building with an attached garage:

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

b) Is there at least on Section A – Property Information ent sides of the attached garage? ☐ Yes ☐ No ☐ N/A

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

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

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

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

Flood Openings – A8 and A9

Definition

- a permanent opening that allows for the free passage of water automatically in both directions without human intervention.

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

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

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

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

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

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

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

Structure is compliant if A8c is equal to or greater than A8a

A9. For a building with an attached garage:

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

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

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

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

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

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

Structure is compliant if A9c is equal to or greater than A9a

FEMA

Enclosures – Section A8 and A9

An enclosure is formed when any space below the BFE is enclosed on all sides.

- Spaces below elevated buildings can be used **only** for building access, parking, and limited storage.
- Enclosures must remain unfinished
- No mechanical, electrical, or plumbing equipment is to be installed below the BFE.

FEMA

Section B – Flood Map Information

FIRM panel information recorded in this section:

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1.a. NFIP Community Name: _____ B1.b. NFIP Community Identification Number: _____

B2. County Name: _____ B3. State: _____ B4. Map/Panel No.: _____ B5. Suffix: _____

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

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

B10. Indicate the source of the BFE data or Base Flood Depth entered in Item B9:

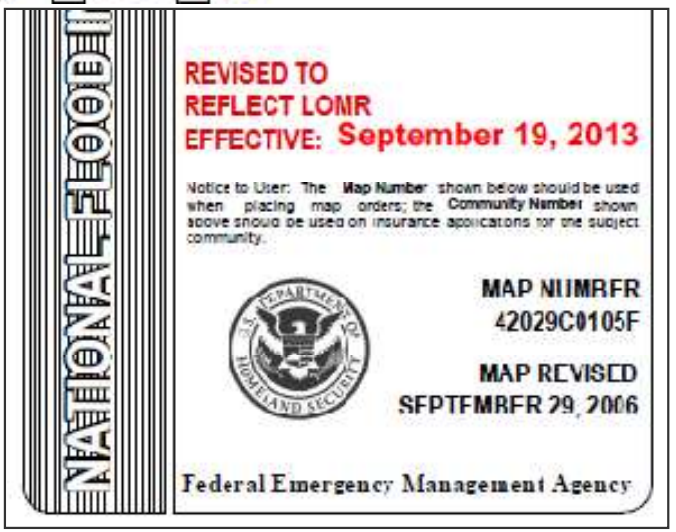
☐ FIS ☐ FIRM ☐ Community Determined ☐ Other: _____

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

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

Designation Date: _____ ☐ CBRS ☐ OPA

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



FEMA

Key Takeaways – Sections A and B

- Make sure the Building Diagram makes sense.
- If there is an enclosed area or garage floor below the BFE, compare square footage of crawlspace to net area of openings.
- If there are engineered openings, make sure the specification sheet is included with the permit file.
- Make sure the correct FIRM panel has been used, with consideration to any LOMRs.
- Check the BFE to make sure that it makes sense and that the flood profile has been used to determine the BFE for streams. A whole number BFE should be a red flag in riverine situations.

FEMA

Section C – Surveyed Building Elevations

Official Survey Required

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. Complete Items C2.a–h below according to the Building Diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

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

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other: _____

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

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

Key Takeaways – Sectior

FEMA

Section C1 – Stage of Construction

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____

WEST ELEVATION

Building Plan Image Source - http://experienceoakhill.com/wp-content/uploads/2012/04/jmh-survey-03_LR1.jpg
Under Construction Image Source - http://static.ddmcdn.com/gif/house4.jpg

Section C2 – Benchmark and Datum

Datum for E.C. must be same as FEMA Map datum!

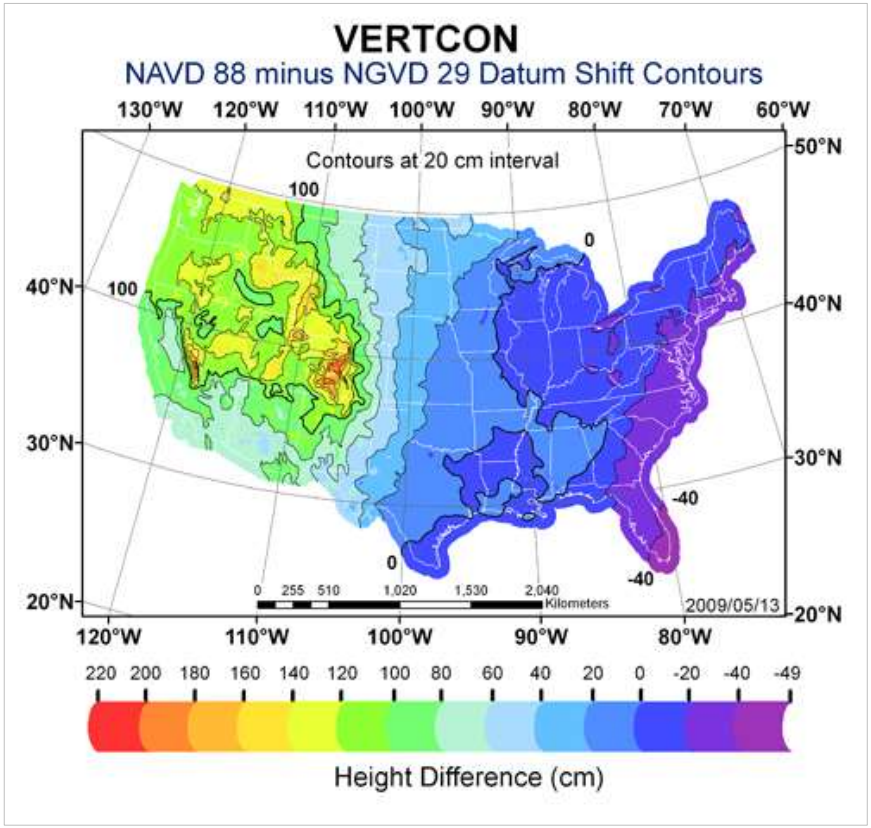
SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____



FEMA

Benchmark image: http://img.groundspeak.com/waymarking/display/e5a68622-4104-41f6-8c56-32903b8bedf8.jpg

VERTCON image: https://www.ngs.noaa.gov/TOOLS/Vertcon/VERTCON_sm.png

Section C – Building Elevations

C.2 Items a-h – Make sure survey is using FEMA Datum

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

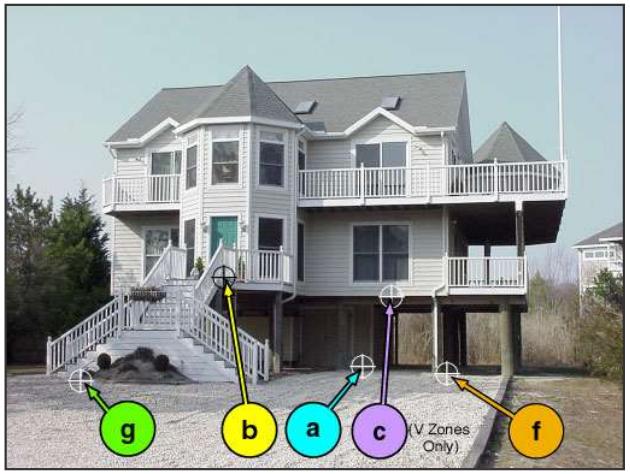
Benchmark Utilized: _____ Vertical Datum: _____

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

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____

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

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



FEMA

Section C – Top of Bottom Floor

Areas used for C.2.a

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

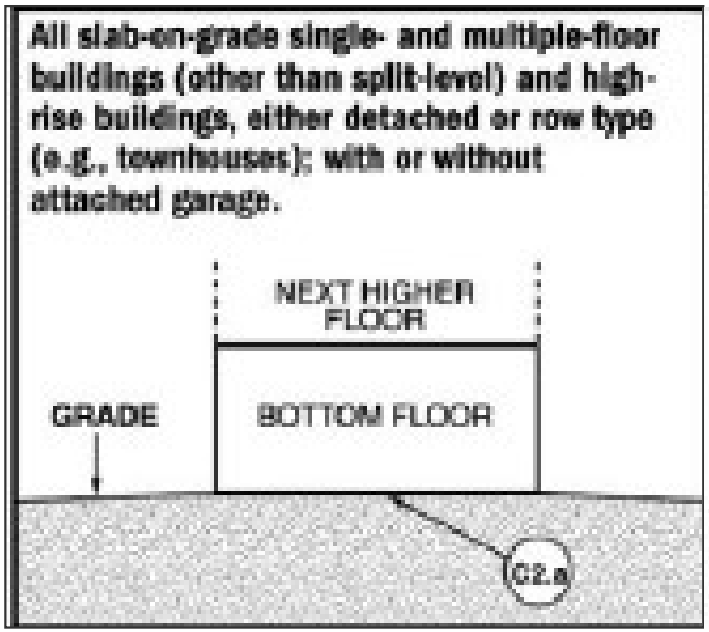
C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

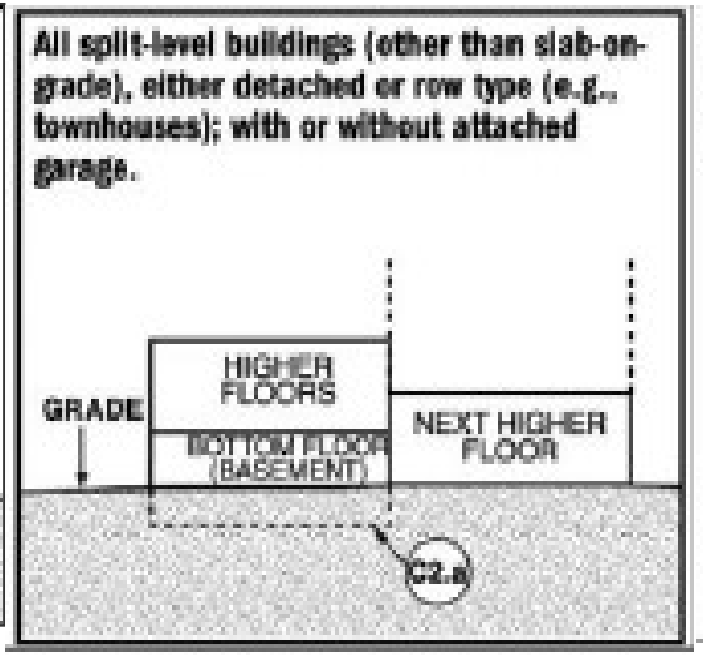
C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

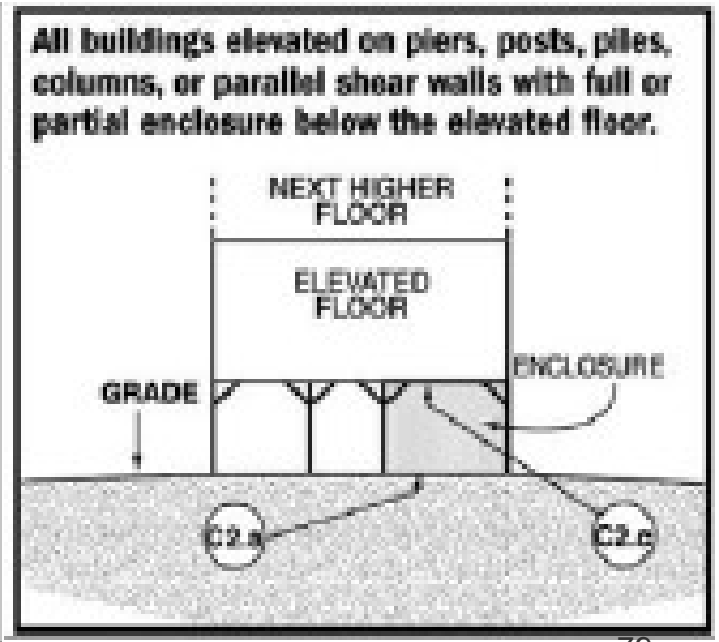
Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____
Datum used for building elevations must be the same as that used for the BFE.

	Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor) _____ . _____	☐ feet	☐ meters
b) Top of the next higher floor _____ . _____	☐ feet	☐ meters







Section C – Top Next Higher Floor

Areas used for C.2.b

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

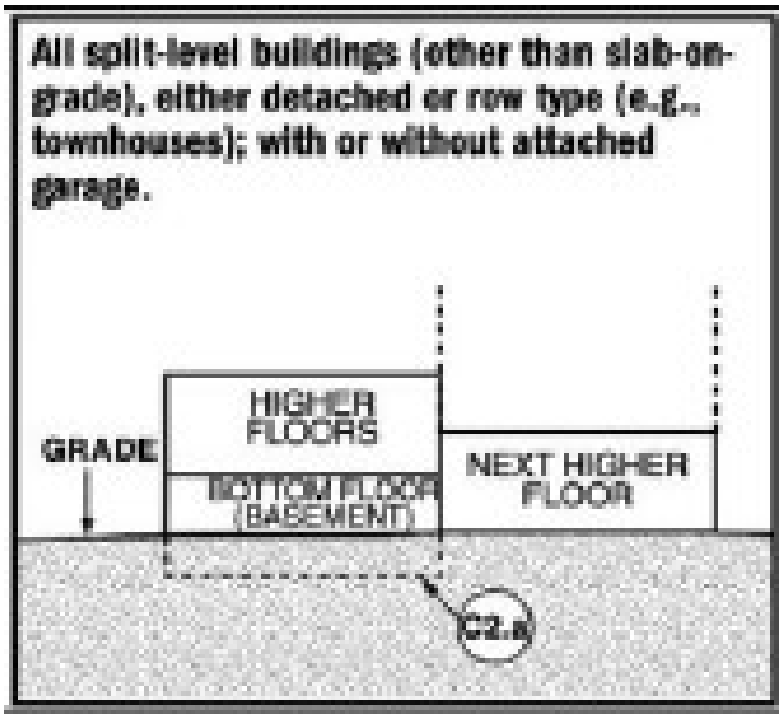
Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____
Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

a) Top of bottom floor (including basement, crawlspace, or enclosure floor) _____ ☐ feet ☐ meters

b) Top of the next higher floor _____ ☐ feet ☐ meters

- Floor above basement
- Floor above enclosure
- Floor above crawl space



FEMA

Section C – Lowest Horizontal Member

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____
Datum used for building elevations must be the same as that used for the BFE.

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	_____ . _____	☐ feet	☐ meters
b) Top of the next higher floor	_____ . _____	☐ feet	☐ meters
c) Bottom of the lowest horizontal structural member (V Zones only)	_____ . _____	☐ feet	☐ meters
d) Attached garage (top of slab)	_____ . _____	☐ feet	☐ meters

FEMA

Section C – Attached Garage

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____
Datum used for building elevations must be the same as that used for the BFE.

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	_____ . _____	☐ feet	☐ meters
b) Top of the next higher floor	_____ . _____	☐ feet	☐ meters
c) Bottom of the lowest horizontal structural member (V Zones only)	_____ . _____	☐ feet	☐ meters
d) Attached garage (top of slab)	_____ . _____	☐ feet	☐ meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	_____ . _____	☐ feet	☐ meters

FEMA

Section C – Machinery or Equipment

- Includes elevators, furnaces, hot water heaters, heat pumps, air conditioners, etc.
- Use comments section to state type of machinery and location

FEMA

Section C – Adjacent Grade Elevations

C.2.f-h Lowest and highest adjacent grade – at any point surrounding the structure

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

Check the measurement used:

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

Note: **C.2.h** – If the grade at the attached deck or stairs is lower than the grade c.2.f, then the deck elevation governs whether the structure is in the flood plain. (If the deck is flooded and damaged, it can damage the main structure).

FEMA

Section D – Professional Certification

Official Certification Required

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

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

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

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

Certifier's Name		License Number	
Title	Company Name		
Address	City	State	ZIP Code
Signature	Date	Telephone	

PLACE SEAL HERE

Minimum information required:

- Section D may be signed only by a land surveyor, engineer, or architect who is authorized by law to certify elevation information.
- The elevation data on this form is ONLY valid for compliance purposes if a seal placed is placed in the seal box.

- Name License number Signature Date Seal

FEMA

Section D – Certifier's Comments

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

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

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

Certifier's Name	License Number	Place Seal Here
Title		
Company Name		
Address		
City	State ZIP Code	
Signature	Date Telephone Ext.	

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

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

- Bottom of Page Two
- Comments will be included here to clarify any of the entries in Sections A, B, or C.

FEMA

Key Takeaways – Sections C and D

- Notice whether building elevations make sense in relation to each other
  - Lowest adjacent grade should not be higher than highest adjacent grade
- Remember elevations tied to NFIP compliance
  - Top of Bottom Floor
  - Lowest Horizontal Structural Member
  - Lowest Machinery
- Review certification for legitimacy
- Review comments for additional important details about the building

FEMA

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

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

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

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

a) Top of bottom floor (including basement, crawlspace, or enclosure) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (C2.b in applicable Building Diagram) of the building is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

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

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

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

- Property owners can provide measurements that insurance agents can use to rate a flood insurance policy in Zone A
- These elevations are not informative of risk or water surface elevations – should **not be** used for permitting purposes

FEMA

Section E – Zones A and AO

For Zones *Without* Base Flood Elevation

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

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

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

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

a) Top of bottom floor (including basement, crawlspace, or enclosure) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (C2.b in applicable Building Diagram) of the building is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

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

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

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

FEMA

- This section can provide additional information to rate a flood insurance policy when a BFE is not available

Section F – Property Owner Certification

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

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

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

Property Owner or Owner's Authorized Representative Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Telephone: Ext.:_____Email:_____

Signature: _____ Date: _____

Comments:

- If a property owner or authorized representative completes Section E, he/she will need to sign and date this section.

FEMA

Section G – Community Information

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

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

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

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

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

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

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

G5. Permit Number: _____ G6. Date Permit Issued: _____

G7. Date Certificate of Compliance/Occupancy Issued: _____

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

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

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

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

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

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

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

Local Official's Name: _____ Title: _____

NFIP Community Name: _____

Telephone: _____ Ext.: _____ Email: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Signature: _____ Date: _____

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

FEMA

- Only used if a community official completes Sections C or E

Additional Considerations

- No section should be left blank
  - Use “N/A” or “0” instead of leaving a section blank.
- Ensure each page of the EC includes the address of the structure
- The local official should not mark up the form to correct information
  - The information in sections A, B and C is certified by a land surveyor, engineer, or architect who is authorized by law to certify elevation information.

FEMA

Completed Elevation Certificate for example

Section A

ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1–9.

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

SECTION A – PROPERTY INFORMATION	FOR INSURANCE COMPANY USE
A1. Building Owner's Name	Policy Number:
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. One South Main Street - Building #9 - Flex building	Company NAIC Number:
City: Spring City — State: Pennsylvania — ZIP Code: 19475	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) Chester County, PA UPI #: 14-4-531; Deed book: 4913, page 1024. BUILDING #9	

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

A5. Latitude/Longitude: Lat. 40.17863° N Long. -75.54472° W 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 1B

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

a) Square footage of crawlspace or enclosure(s) 0 sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade 0

c) Total net area of flood openings in A8.b 0 sq in

d) Engineered flood openings? ☐ Yes ☒ No

A9. For a building with an attached garage:

a) Square footage of attached garage 0 sq ft

b) Number 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

Completed Elevation Certificate for example

Section B

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State
Borough of Spring City, #420289	Chester County	Pennsylvania

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)
42029C0060	F	09/29/2006	09/29/2006	AE	109.2

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

[x] FIS Profile [ ] FIRM [ ] Community Determined [ ] Other/Source: _____

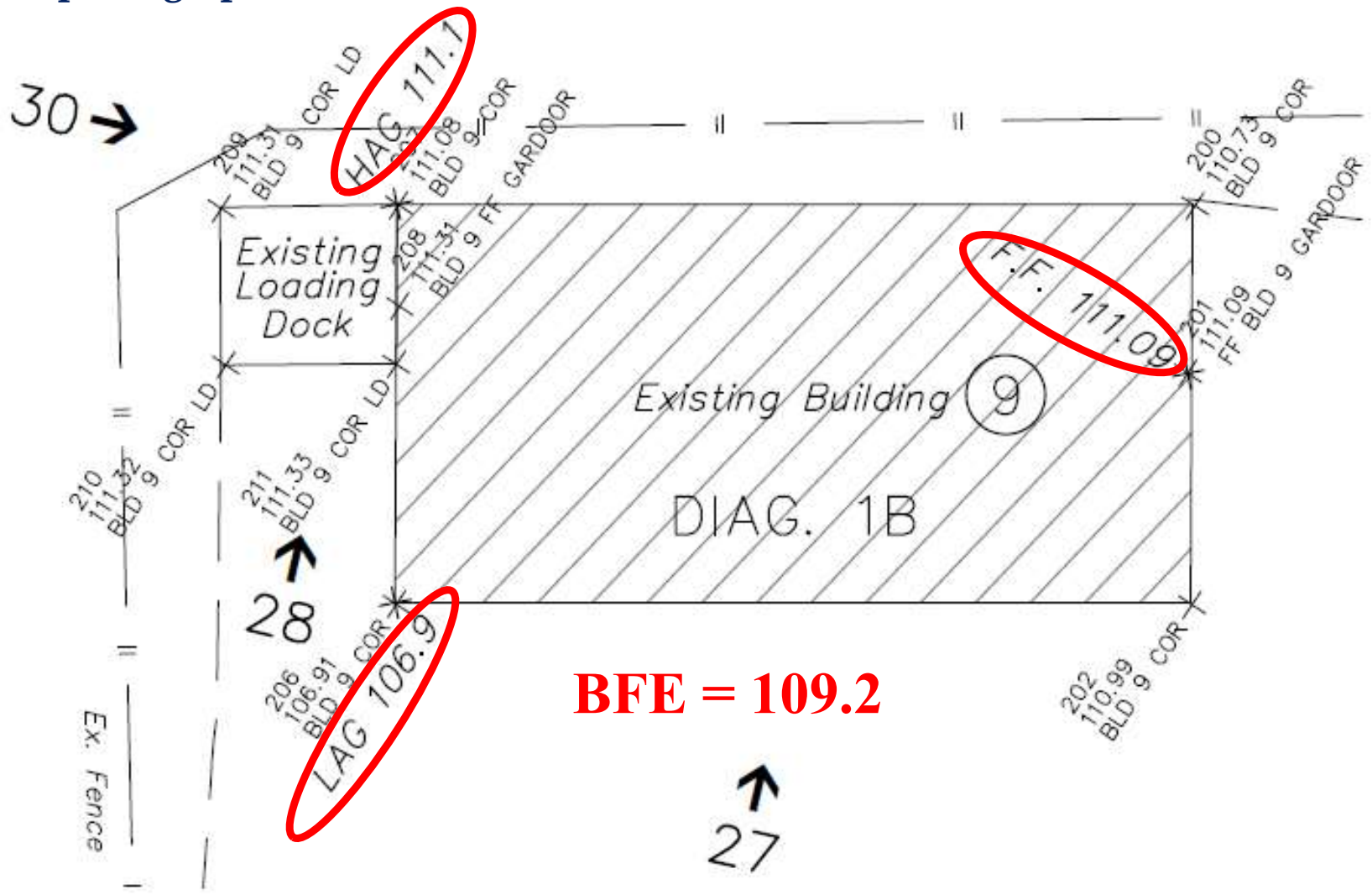
B11. Indicate elevation datum used for BFE in Item B9: [ ] NGVD 1929 [x] NAVD 1988 [ ] Other/Source: _____

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

Designation Date: _____ [ ] CBRS [ ] OPA

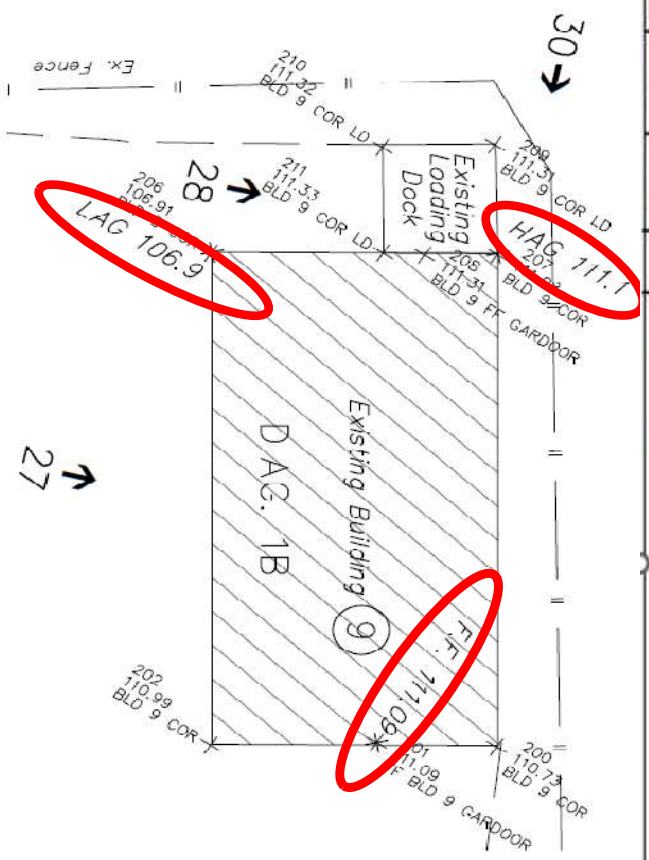
Elevation Certificate Survey Field Data Plot

1. **From survey, plot building, showing spot elevations.**
2. **Calculate Lowest floor Elevation, LAG and HAG.**
3. **Indicate locations of any other elevations reported in Section C2.**
4. **Indicate Building Diagram number.**
5. **Show photograph locations.**



Completed Elevation Certificate for example

Section C



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. One South Main Street - Building #9 - Flex building			Policy Number:
City Spring City	State Pennsylvania	ZIP Code 19475	Company NAIC Number

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: GPS Vertical Datum: NAVD 1988

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

☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source:

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

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	111.1	☒ feet	☐ meters
b) Top of the next higher floor		☒ feet	☐ meters
c) Bottom of the lowest horizontal structural member (V Zones only)		☒ feet	☐ meters
d) Attached garage (top of slab)		☒ feet	☐ meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)		☒ feet	☐ meters
f) Lowest adjacent (finished) grade next to building (LAG)	106.9	☒ feet	☐ meters
g) Highest adjacent (finished) grade next to building (HAG)	111.1	☒ feet	☐ meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support		☒ feet	☐ meters

Completed Elevation Certificate for example

Section D

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

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

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

Certifier's Name	License Number	Place Seal Here
Title		
Company Name		
Address		
City	State / ZIP Code	
Signature	Date / Telephone	

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

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

Building elevated above the BFE. Building used for storage of castings and equipment. Since loading dock grade is below the BFE, this building is in Zone AE.

Completed Elevation Certificate for example

Section E For Zone A Streams

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. One South Main Street - Building #9 - Flex building			Policy Number:
City Spring City	State Pennsylvania	ZIP Code 19475	Company NAIC Number

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

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

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).

a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

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

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

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

Completed Elevation Certificate for example

Section F For Property Owner Certification only

SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION			
The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.			
Property Owner or Owner's Authorized Representative's Name			
Address	City	State	ZIP Code
Signature	Date	Telephone	
Comments			

Completed Elevation Certificate for example

Section G If prepared by Community Official only

SECTION G – COMMUNITY INFORMATION (OPTIONAL)

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

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

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

G3. ☐ The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate of Compliance/Occupancy Issued

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

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

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

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

Local Official's Name	Title
Community Name	**Telephone**
Signature	**Date**

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

Completed Elevation Certificate for example

Building photographs – If possible, photo front, rear, left right, stairs and equipment

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. One South Main Street - Building #9 - Flex building			Policy Number:
City Spring City	State Pennsylvania	ZIP Code 19475	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A8. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.

Photographs Taken 2/02/2015

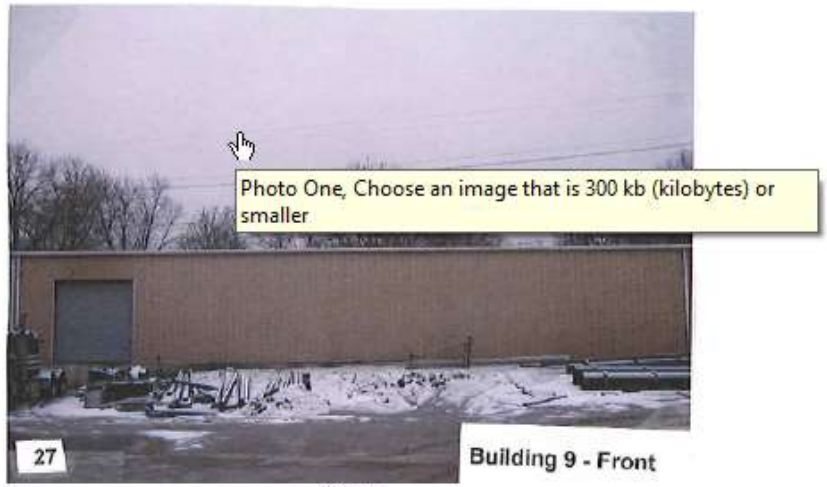


Photo One

Photo One Caption Front view

Photo Two

Photo Two Caption Left side with loading dock.

Completed Elevation Certificate for example

Building photographs – If possible, photo front, rear, left right, stairs and equipment

Photographs Taken 2/02/2015

Photo One

Photo One Caption Right side at floor level.

Photo Two

Photo Two Caption Rear view, left edge is retaining wall

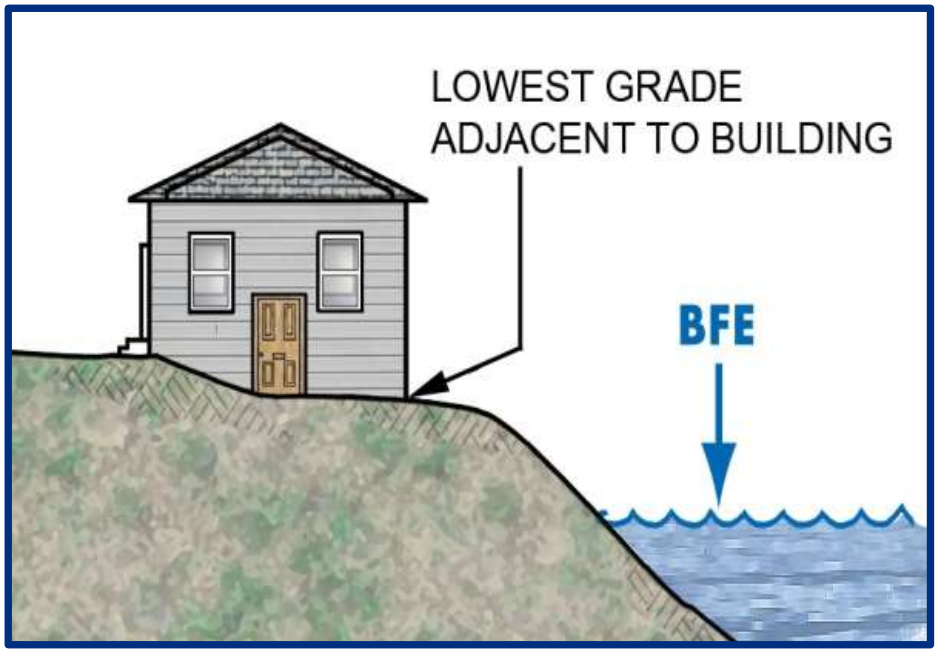
LOMCS – LETTER OF MAP CHANGE

Mapping and Risk Identification

FEMA

Other Mechanisms to Update FIRMs

Letters of Map Change (LOMCs)



***Caution:** Placement of fill around an existing foundation to increase the LAG could result in non-compliance

- To **remove** the mandatory flood insurance requirement
  - Inadvertent inclusions – structures built on naturally high grade above the SFHA
  - Structures elevated on fill
- To **update the map** due to:
  - Better topographic data
  - A physical change in the floodplain
  - Better modeling

FEMA

Why Apply for a LOMC?

Most Common Reasons:

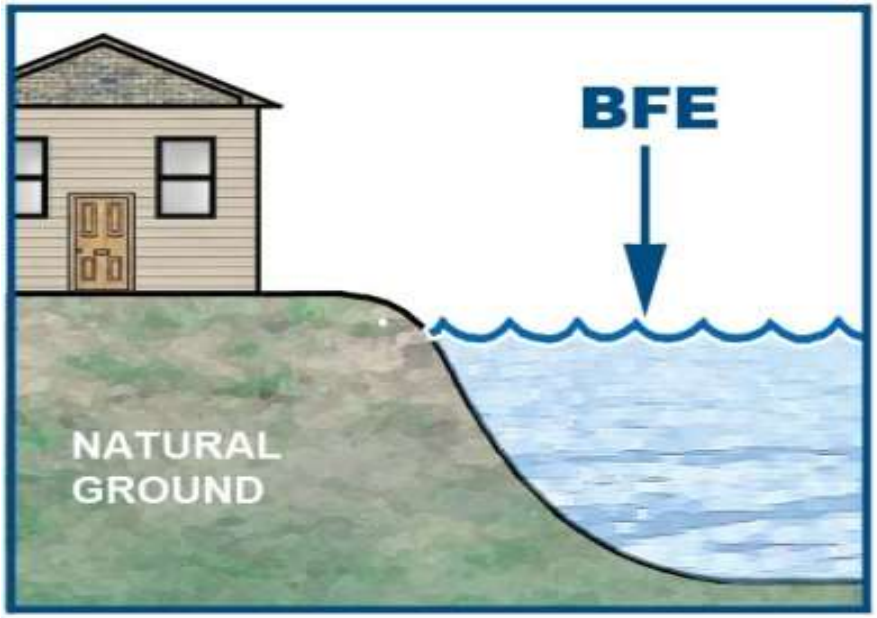
- Remove the **mandatory flood insurance requirement (the lender has the option to require insurance)**
- Adjust/refine flood insurance rate information
- Better understand the flood risk associated with a structure or property

Other Reasons:

- To support a floodplain development permit application
- To understand the effects of proposed development in the SFHA
- To reflect the effects of **recent development in the floodplain**
  - Watercourse alterations/repairs
  - Bridge/culvert/roadway repairs

FEMA

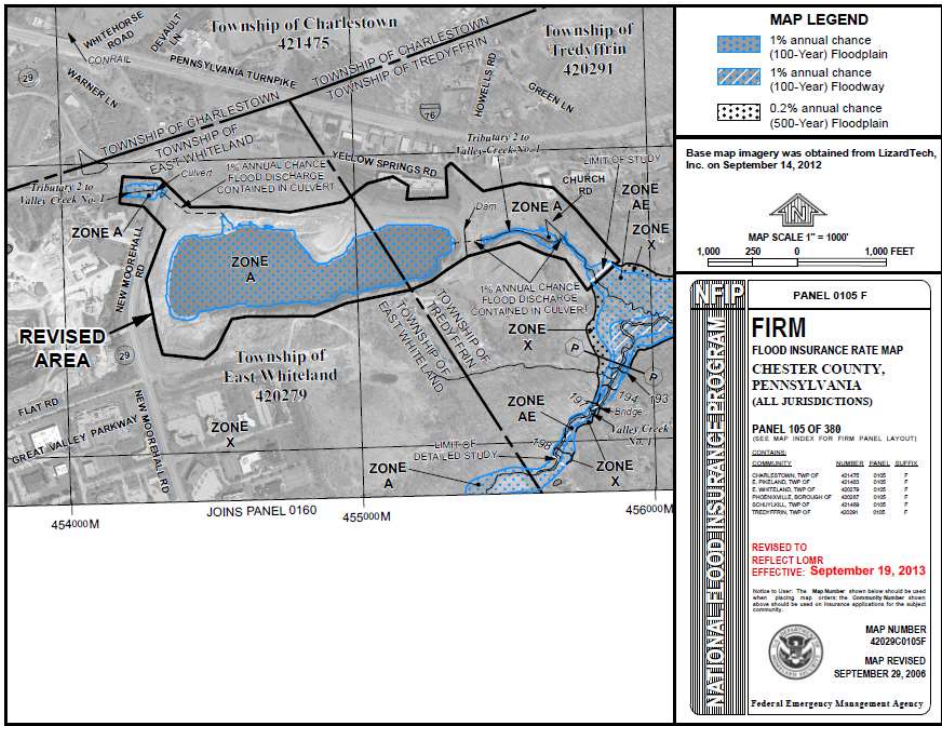
Letters of Map Amendment (LOMAs)



- LOMAs provide flood zone determinations for individual properties and structures
  - Usually used to show structure is **out of the SFHA**
  - Not required by floodplain management regulations
  - Based on **natural ground elevations**
  - No physical change to the FIRM

FEMA

Letters of Map Revision (LOMRs)



- LOMRs **physically update** or refine the flood hazard information on the FIRM
  - Results in adjustments to the height of the BFE or boundaries of the SFHA
  - Ensures that the FIRM is the most accurate reflection of the flood risk
  - Requires engineering analyses and scientific data

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Resources

- FEMA Map Information eXchange (FMIX)
  - Toll free by phone at 1-877-336-2627
  - By email at FEMAMapSpecialist@riskmapcds.com
- FEMA Map Service Center
- National Flood Hazard Layer – FEMA GeoPortal
- eLOMA (Mapping Information Platform)
- Online LOMC
- Code of Federal Regulations
- LOMC Fee Information
- FEMA Forms
- NFIP Technical Bulletins
- USGS Vertical Datum Conversion Information

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Availability of Flood Insurance

- Any structure owner in an NFIP participating community can purchase flood insurance.
- YES, this means **any structure and its contents** inside or outside of the Special Flood Hazard Area can be covered!
- Flood insurance may be sold by any state-licensed insurance agent.

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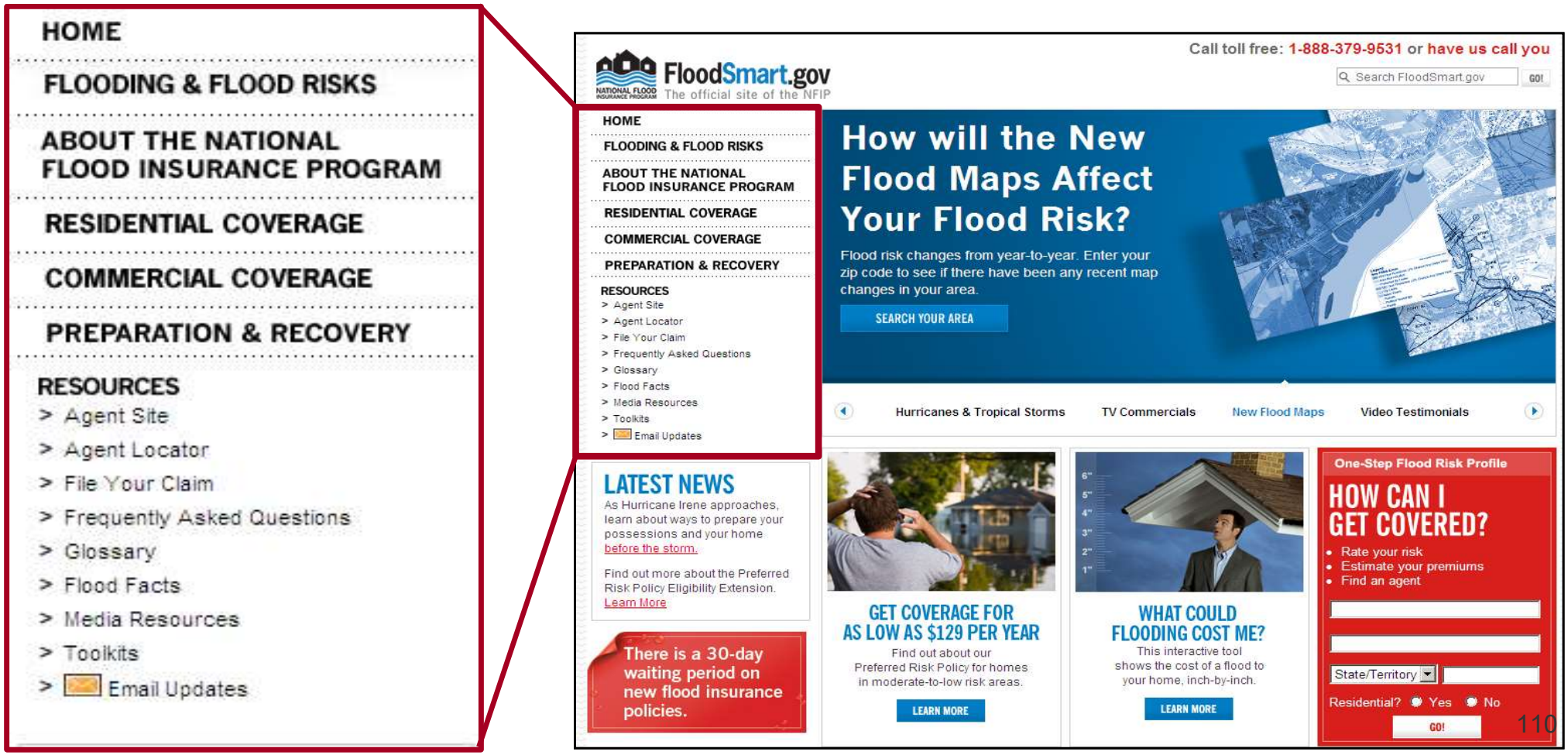
Flood Insurance

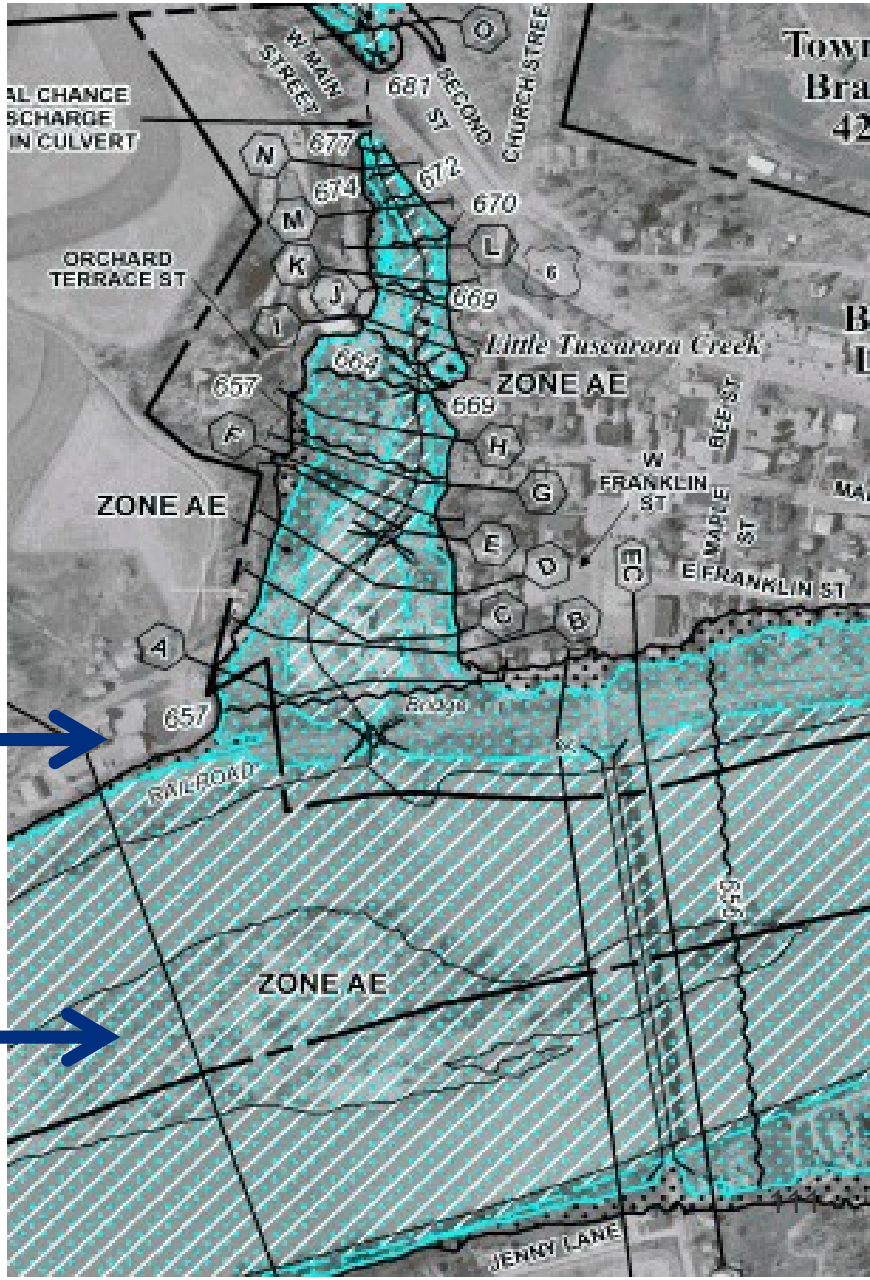
- **FloodSmart.gov**
- Need help finding an insurance agent call **1- 800-720-1093 or go to www.floodsmart.gov**



Mandatory Purchase Requirement

Mandatory purchase of flood insurance for structures in or touching the SFHA

Caveat – although insurance may not be required, lenders have the prerogative to require insurance to cover perceived risk



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Rating Considerations

Elevation in relation to BFE / LAG

Flood Zone

Compliant Openings

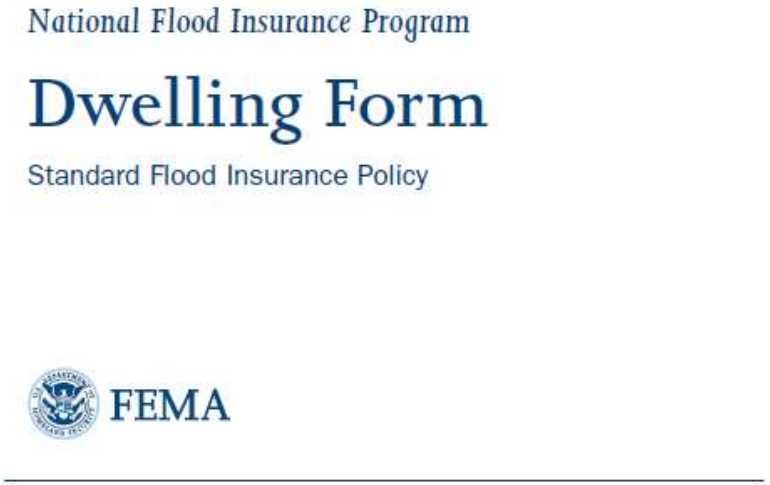
Pre/Post-FIRM

Mechanicals elevation

Residential vs. non-residential

Floodproofing

Elevation Certificates



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Preferred Risk Policy (PRP)

- Any insurable structure located in B, C or X Zones that have not experienced significant previous flood damage.
- Provides combinations of building and contents coverage
- Reasonably priced – starts around $125 a year depending on amount of coverage.
- Thirty percent of all flood damage claims nationwide are from structures located outside the floodplain.

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Impact of changes to the NFIP resulting from BW 2012 and HFIAA 2014

CHANGES TO THE NFIP

FEMA

Changes are Coming to the NFIP

Flood Insurance Reform Act of 2012 (Biggert Waters 2012)

Homeowner Flood Insurance Affordability Act of 2014

Goal:

- To make the NFIP more financially stable by raising rates on certain classes of property to reflect true flood risk

Mechanism:

- Premium rate changes for some subsidized policies to accurately reflect the flood risk.
- Addition of annual policy surcharges

FEMA

Flood Risks and Costs are Changing

Insurance Reform Messaging – Why are Rates Increasing?

Weather patterns, erosion, and development are a few factors increasing flood risk in many communities.

Better science, improved tools and more data are providing more accurate definition of flood hazards.

More buildings and other infrastructure are being built in areas at risk for flooding and replacement costs continue to grow.

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Flood Insurance Rates are Changing

- Rates for most properties will more accurately reflect risk.
- Subsidized rates are being phased out over the next several years.
- Premium rates for most categories will increase between 5 – 15 percent annually.
- Surcharges are not considered premium and will be in addition to annual premium increases.

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Who Will Be Affected?

Only 20% of NFIP policies receive subsidies

Gradual rate increases of 5%-15% annually

Premiums cannot increase more than 18% annually

Exceptions for policies that will see 25% annual until reaching full-risk rates:

- Older business properties insured with subsidized rates
- Older non-primary residences insured with subsidized rates
- Severe Repetitive Loss Properties insured with subsidized rates
- Buildings that have been substantially damaged or improved

New purchaser can retain the same rates as the prior owner

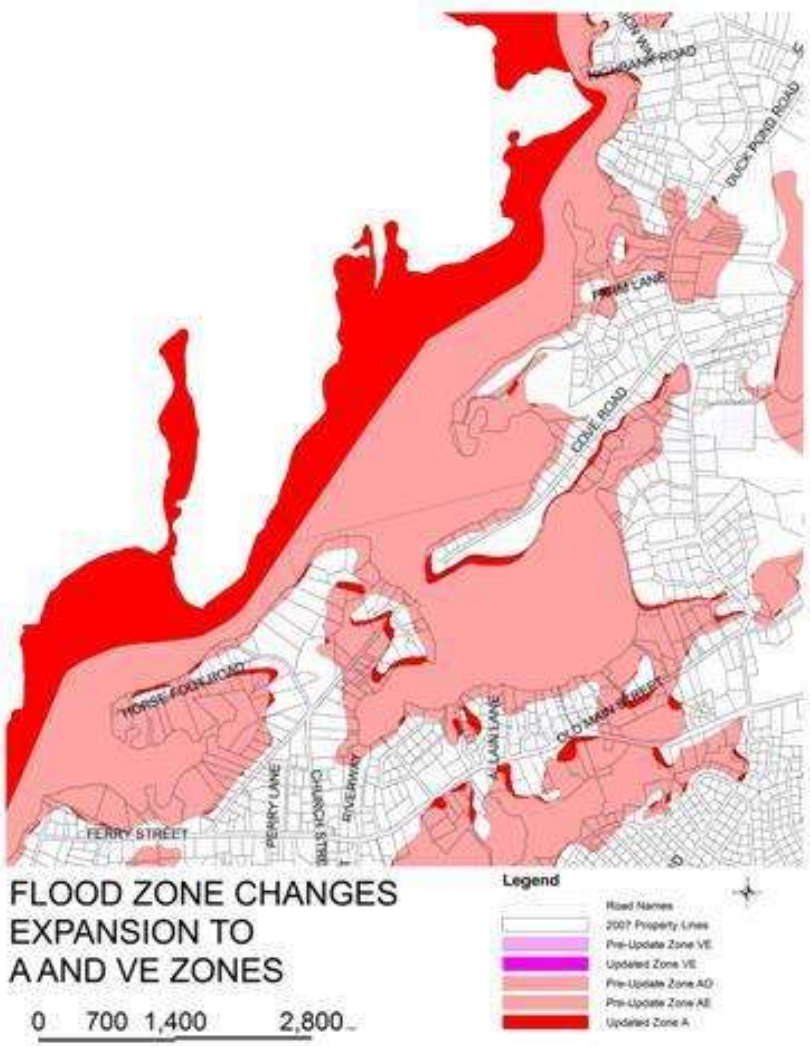
FEMA

Grandfathering Under HFIAA

When maps change properties can be grandfathered into lower risk classes/lower BFE

Newly identified properties in the SFHA may be eligible for reduced premiums under the Newly Mapped Procedure

No more than an 18% premium increase annually for an individual policyholder



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Elevating Above the BFE Saves Money

NFIP premiums based on October 2011 rates

One-floor residential structure with no basement built Post-FIRM

$250,000 coverage for the building and $100,000 for contents

At BFE Insurance Premium: $1,315 building, $380 contents

Zone AE	Annual NFIP Insurance Savings	Savings Over 30 Year Mortgage
1 ft. below BFE	**-$3,415**	**-$102,450**
At BFE	0	0
1 ft. freeboard	$675 (49%)	$20,250
2 ft. freeboard	$911 (69%)	$27,330
3 ft. freeboard	$983 (75%)	$29,490

Summary: What We Covered

- a broad overview of the components of the NFIP
- mapping tools and resources
- Elevation Certificate considerations
- flood insurance implications
- updates on changes to the NFIP and insurance reform

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NATIONAL FLOOD INSURANCE PROGRAM

Questions?

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SESSION EVALUATION

2025 SURVEYORS' Conference

HTTPS://WWW.SURVEYMONKEY.COM/R/2025PSLSEVAL