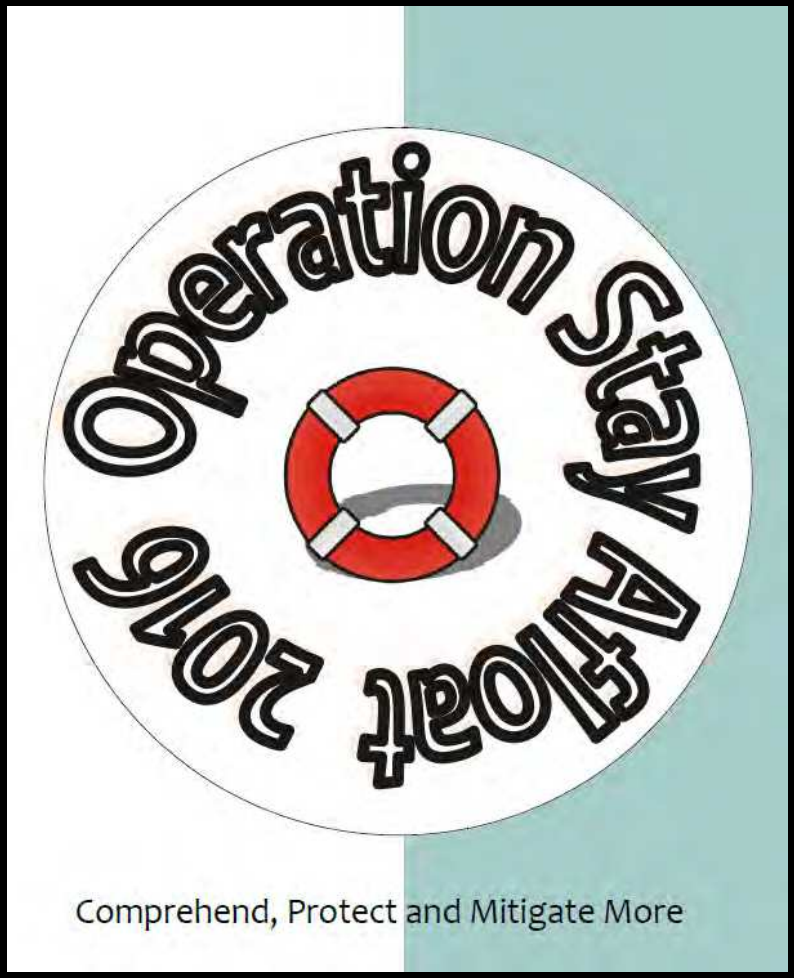
FEMA's NEW ELEVATION CERTIFICATE



By

ROD RENKENBERGER, PS, CFM

Course Goal

To address the most common mistakes made by surveyors when filling out an Elevation Certificate and provide attendees with avenues for seeking corrections of such mistakes

FEMA Elevation Certificate

FEMA

National Flood Insurance Program

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

FEMA Form 086-0-33 (7/15) Replaces all previous editions. Page 1 of 15

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
ELEVATION CERTIFICATE
IMPORTANT: FOLLOW THE INSTRUCTIONS ON PAGES 9-16

OMB Control Number: 1660-0008
Expiration: 11/30/2018

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

SECTION A - PROPERTY INFORMATION | FOR INSURANCE COMPANY USE

A1. Building Owner's Name | Policy Number:

A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. | Company NAIC Number:

City | State | Zip Code

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)

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

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

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

A7. Building Diagram Number _____

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

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

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

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

d) Engineered flood openings? ○ Yes ○ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ○ Yes ○ No

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State

B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/ Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth

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

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

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

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

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.

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

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 Form 086-0-33 (7/15) Replaces all previous editions. Page 3 of 15

Purpose of FEMA Elevation Certificate:

- Compliance with Floodplain Ordinance
- Support a LOMA / LOMR-F Request?
- Flood Insurance Rating?
- Establish FPG for Retrofitting
- Prerequisite for CRS

Top 15 Mistakes on FEMA Elevation Certificates:

7 of top 15 Mistakes on FEMA EC are in Section A:

- Not Using Most Current EC Form
- Incorrect Address
- Incomplete Property Description
- Incorrect Building Diagram
- Counting Basement and Crawlspace Windows as "Permanent Flood Openings"
- Incorrectly Stating the Net Opening Area for a Grated Crawl Space Vent
- Failure to Attach Certificate for Engineered Openings

FEMA Elevation Certificate

IMPORTANT: FOLLOW THE INSTRUCTIONS ON PAGES 9-16

OMB Control Number: 1660-0008
Expiration: 11/30/2018

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City	State	Zip Code

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

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

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

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

d) Engineered flood openings? ◯ Yes ◯ No

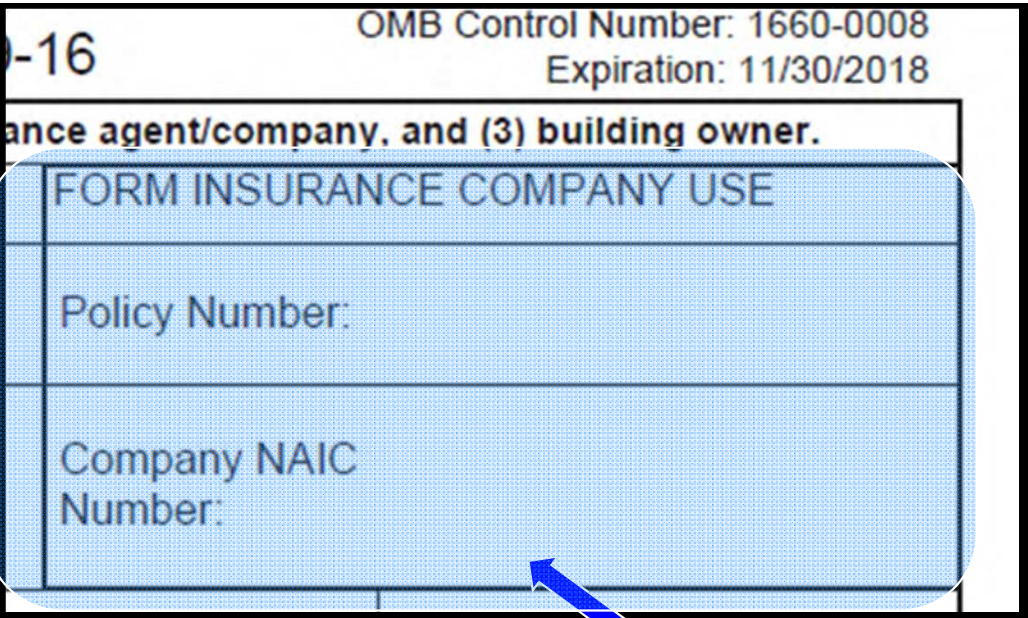
A9. For a building with an attached garage:

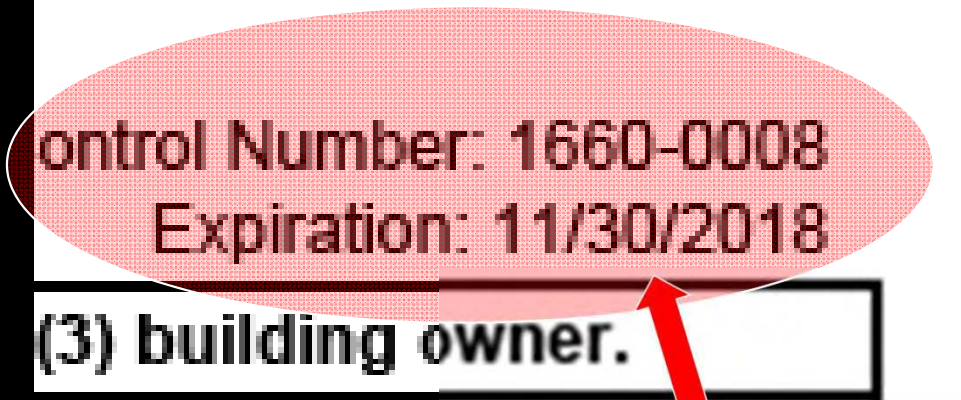
a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ◯ Yes ◯ No





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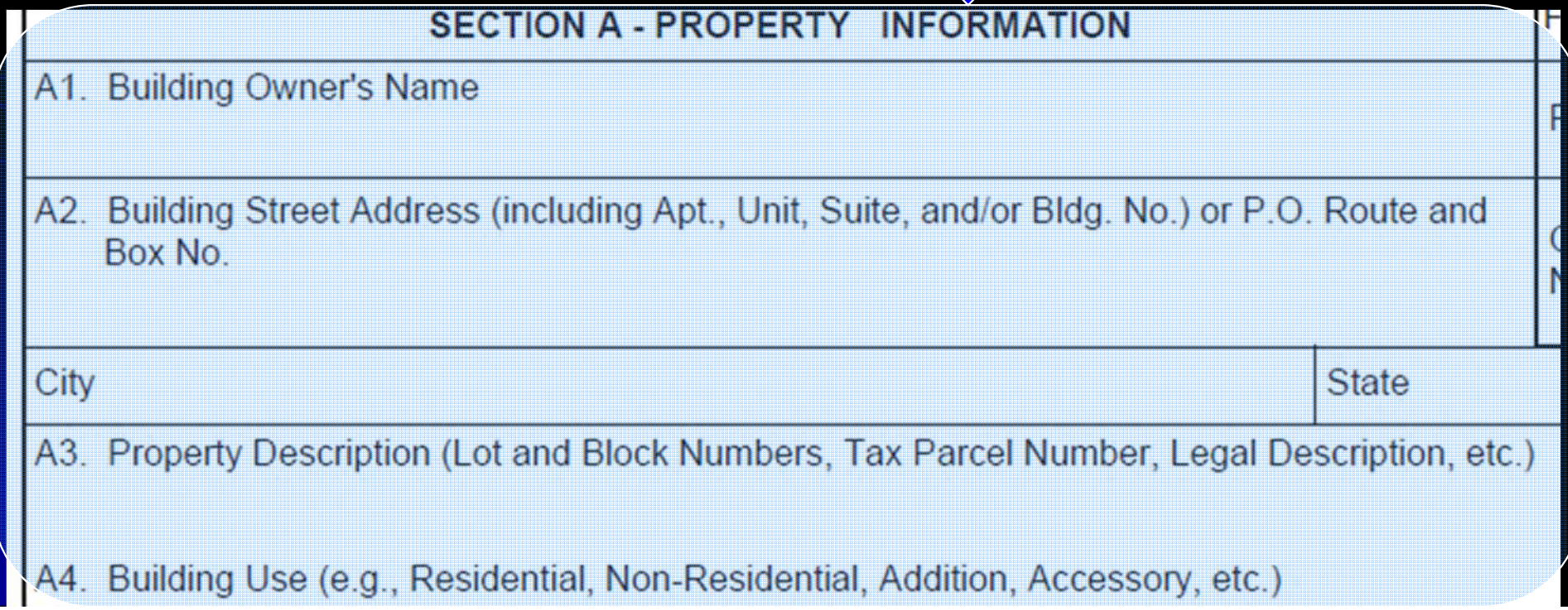
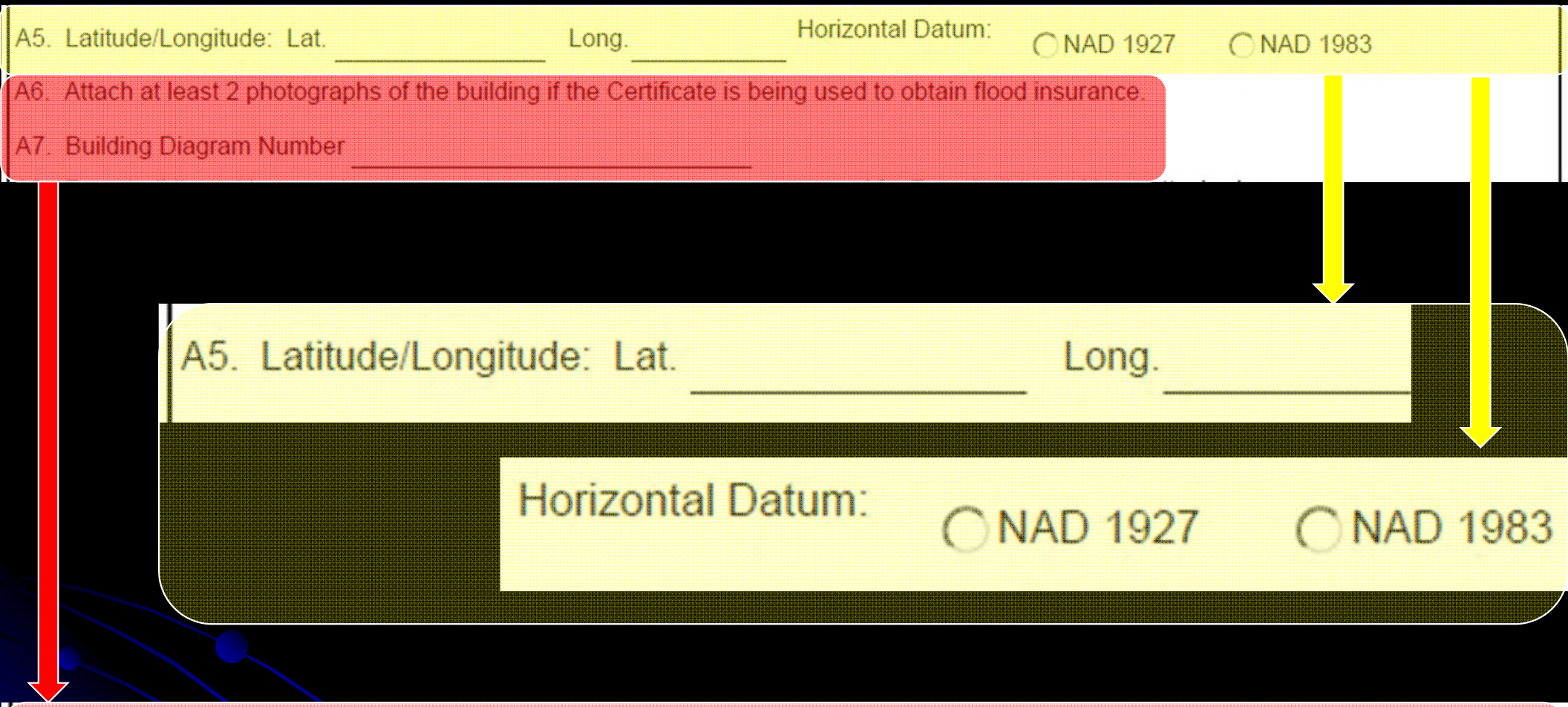
City	State	Zip Code
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)		
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)		





Building Diagram Number –
ASK IF YOU DO NOT KNOW

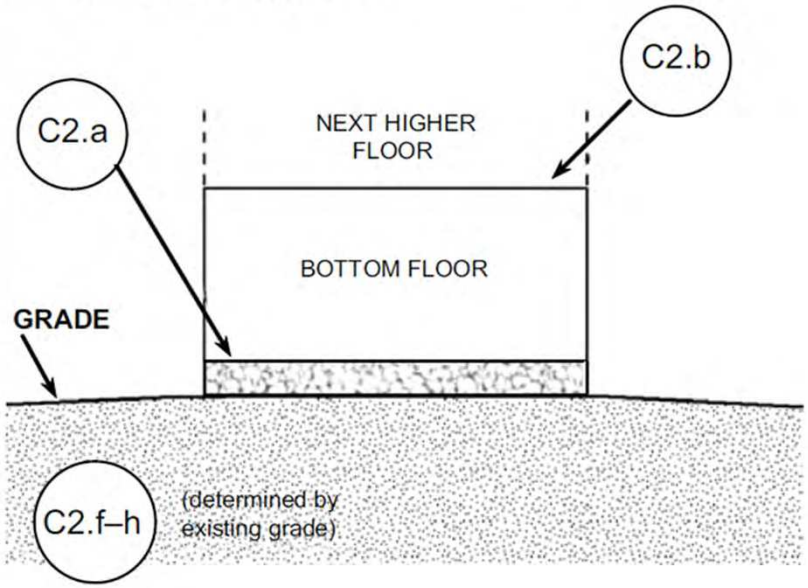
FEMA Elevation Certificate

Diagram 1B = Raised slab or foundation wall with fill

DIAGRAM 1B

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

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



FEMA Elevation Certificate

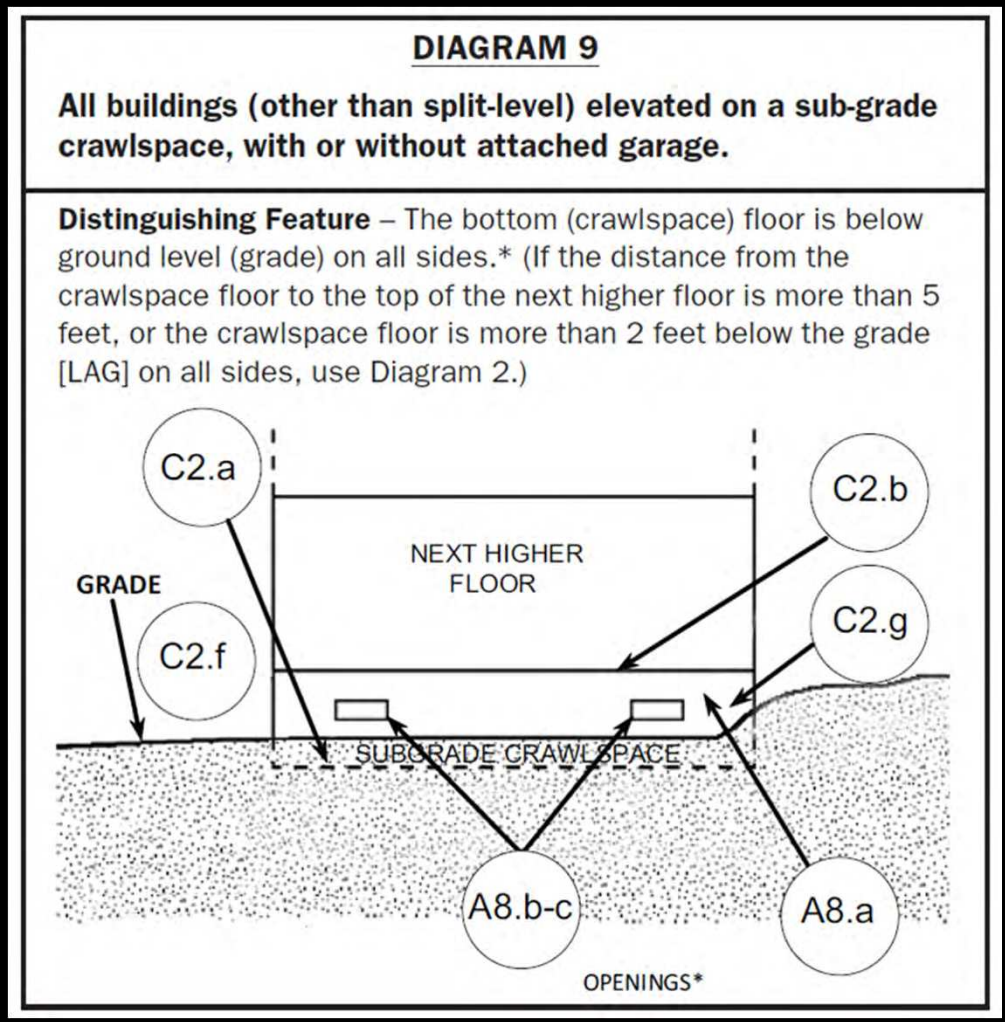
Diagram #9 = Compliant, below grade crawlspace:

Distance from crawlspace floor to top of next higher floor ≤ 5'high; AND Crawlspace floor ≤ 2' below grade on all sides

Non-Compliant , below grade crawlspace:

Distance from crawlspace floor to top of next higher floor > 5' high; OR Crawlspace floor > 2' below grade on all sides BASEMENT

Diagram #2 (#4 if Split-Level)



Basement Windows
ARE NOT
Flood Openings!

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

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

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

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

d) Engineered flood openings? ○ Yes ○ No

A9. For a building with an attached garage:

a) Square footage of attached garage _____ sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____

c) Total net area of flood openings in A9.b _____ sq in

d) Engineered flood openings? ○ Yes ○ No

FOUNDATION VENTS - FLOOD VENTS?

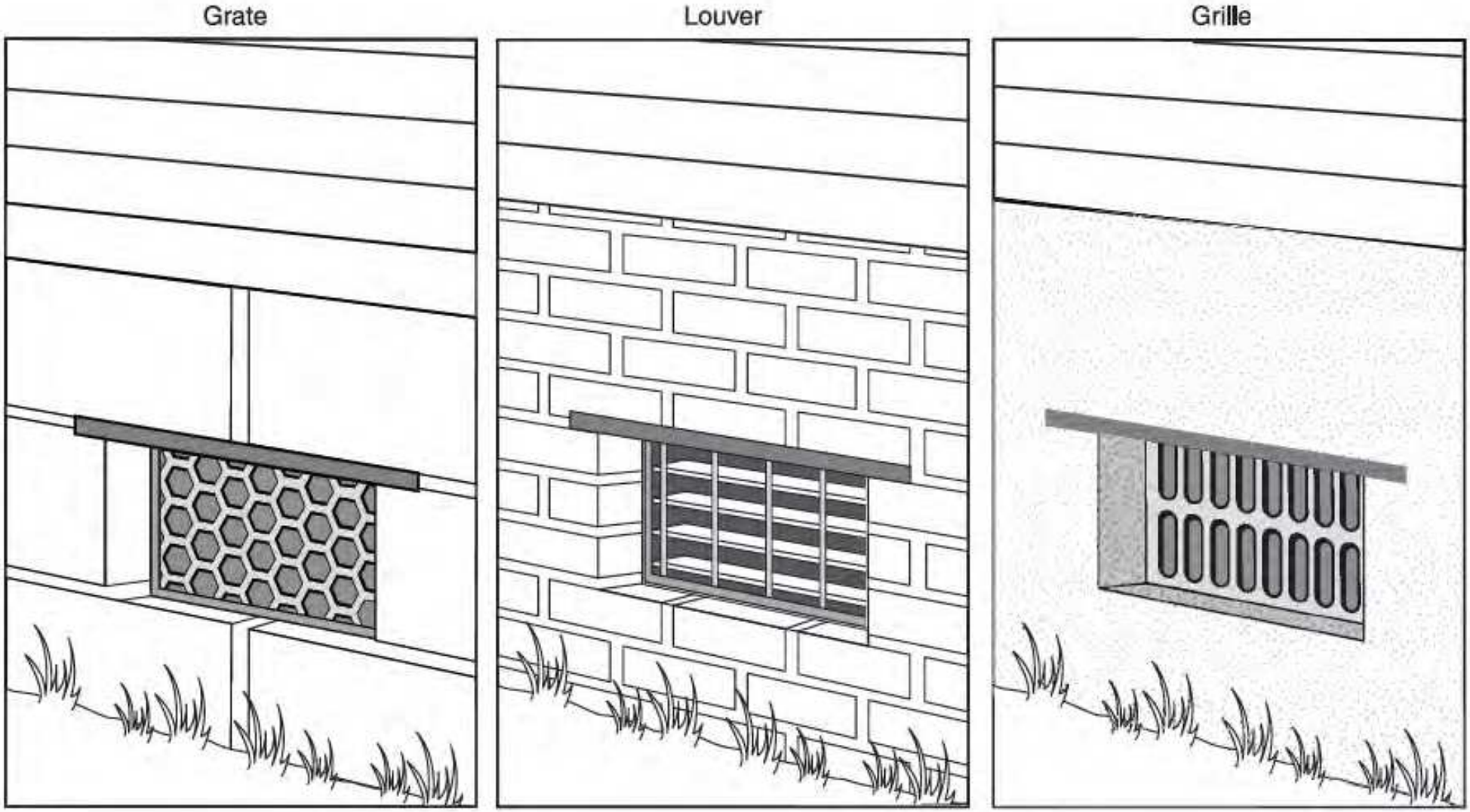
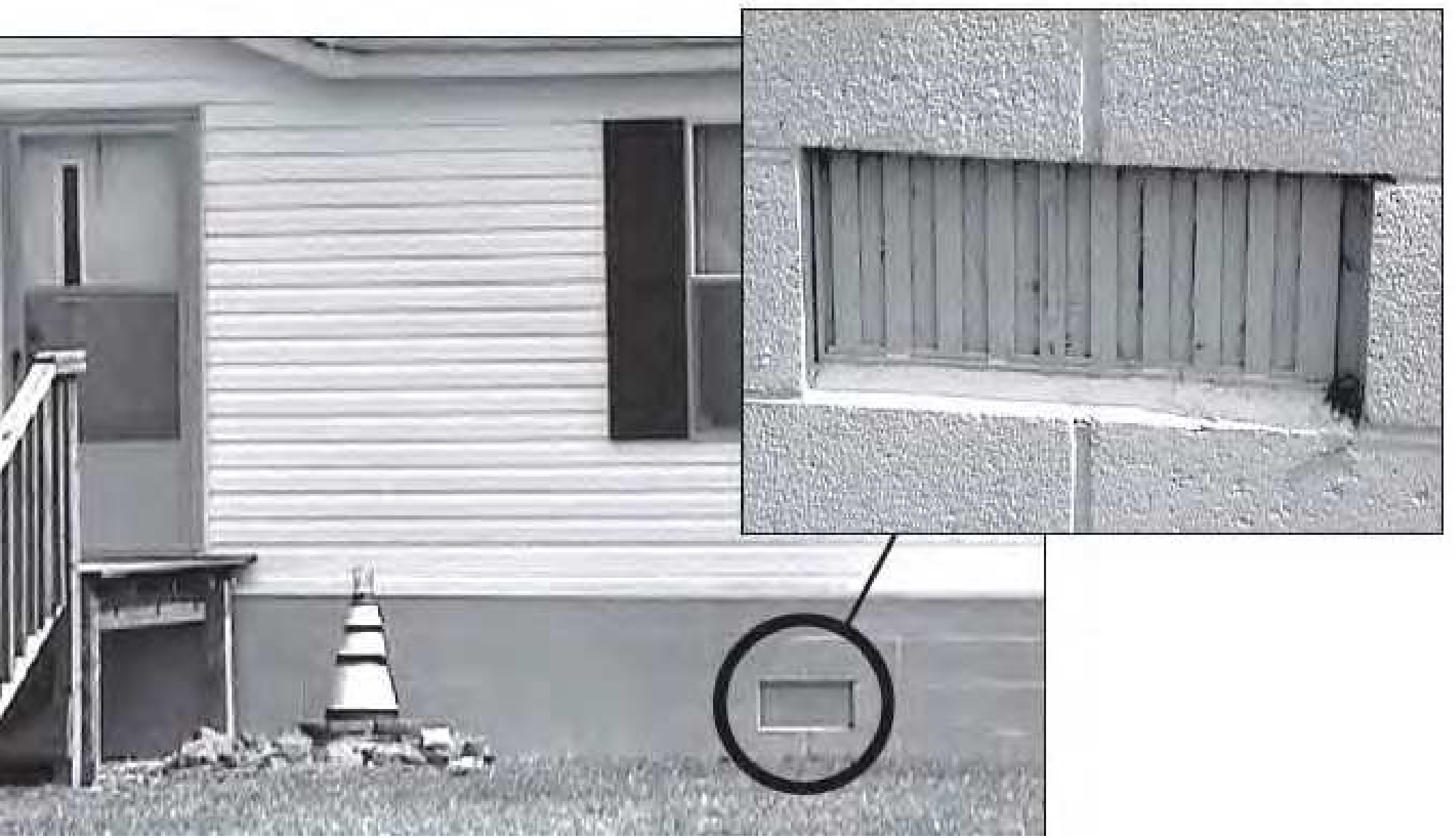


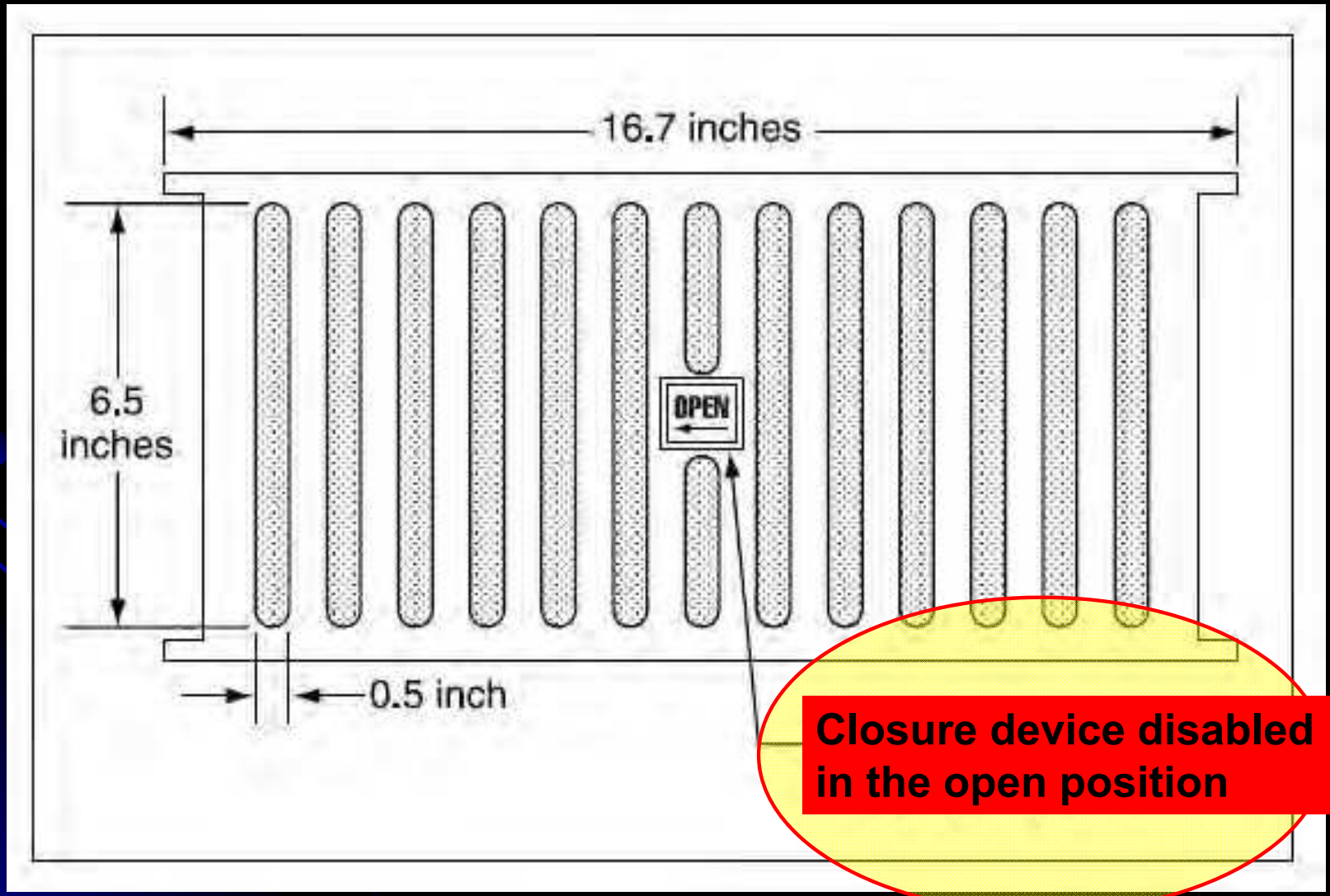
Figure 16. Examples of typical air vents used as flood openings (net open area varies)

Not Acceptable – Vent Not Disabled In Open Position



Typical standard air vent faceplate

Net open area = 42 Sq. Inches



Engineered Openings

Documentation Required – attach certificate

Must attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES).

ICC EVALUATION SERVICE

Most Widely Accepted and Trusted

ICC-ES Report

ESR-2074

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Reissued 02/2015
This report is subject to renewal 02/2017.

DIVISION: 08 00 00—OPENINGS
SECTION: 08 95 43—VENTS/FOUNDATION FLOOD VENTS

REPORT HOLDER:

SMARTVENT PRODUCTS, INC.

430 ANDBRO DRIVE, UNIT 1
PITMAN, NEW JERSEY 08071

EVALUATION SUBJECT:

SMART VENT® AUTOMATIC FOUNDATION FLOOD VENTS: MODELS #1540-520; #1540-521; #1540-510; #1540-511; #1540-570; #1540-574; #1540-524; #1540-514

ICC ES | ICC ES PMG | ICC ES LISTED

Look for the trusted marks of Conformity!

"2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence"

A Subsidiary of

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

ICC EVALUATION SERVICE

Most Widely Accepted and Trusted

ICC-ES Evaluation Report **ESR-2074***

Reissued February 2015
This report is subject to renewal February 2017.

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

DIVISION: 08 00 00—OPENINGS
Section: 08 95 43—Vents/Foundation Flood Vents

REPORT HOLDER:

SMARTVENT PRODUCTS, INC.
430 ANDBRO DRIVE, UNIT 1
PITMAN, NEW JERSEY 08071
(877) 441-8368
www.smartvent.com
info@smartvent.com

EVALUATION SUBJECT:

SMART VENT® AUTOMATIC FOUNDATION FLOOD VENTS: MODELS #1540-520; #1540-521; #1540-510; #1540-511; #1540-570; #1540-574; #1540-524; #1540-514

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Physical operation
- Water flow

2.0 USES

The Smart Vent® units are engineered mechanically operated flood vents (FVs) employed to equalize hydrostatic pressure on walls of enclosures subject to rising or falling flood waters. Certain models also allow natural ventilation.

3.0 DESCRIPTION

3.1 General:

When subjected to rising water, the Smart Vent® FVs internal floats are activated, then pivot open to allow flow in either direction to equalize water level and hydrostatic pressure from one side of the foundation to the other. The FV pivoting door is normally held in the closed position by a buoyant release device. When subjected to rising water, the buoyant release device causes the unit to unlatch, allowing the door to rotate out of the way and allow flow. The water level stabilizes, equalizing the lateral forces. Each unit is fabricated from stainless steel. Smart Vent® Automatic Foundation Flood Vents are available in various models and sizes as described in Table 1. The SmartVENT® Stacking Model #1540-511 and FloodVENT® Stacking Model #1540-521 units each contain two vertically arranged openings per unit.

3.2 Engineered Opening:

The FVs comply with the design principle noted in Section 2.6.2.2 of ASCE/SEI 24 for a maximum rate of rise and fall of 5.0 feet per hour (0.423 mm/s). In order to comply with the engineered opening requirement of ASCE/SEI 24, Smart Vent FVs must be installed in accordance with Section 4.0.

3.3 Ventilation:

The SmartVENT® Model #1540-510 and SmartVENT® Overhead Door Model #1540-514 both have screen covers with ¼-inch-by-¼-inch (6.35 by 6.35 mm) openings, yielding 51 square inches (32 903 mm²) of net free area to supply natural ventilation. The SmartVENT® Stacking Model #1540-511 consists of two Model #1540-510 units in one assembly, and provides 102 square inches (65 806 mm²) of net free area to supply natural ventilation. Other FVs recognized in this report do not offer natural ventilation.

4.0 DESIGN AND INSTALLATION

SmartVENT® and FloodVENT® are designed to be installed into walls or overhead doors of existing or new construction from the exterior side. Installation of the vents must be in accordance with the manufacturer's instructions, the applicable code and this report. The mounting straps allow mounting in masonry and concrete walls up to 12 inches (305 mm) thick. In order to comply with the engineered opening design principle noted in Section 2.6.2.2 of ASCE/SEI 24, the Smart Vent® FVs must be installed as follows:

- With a minimum of two openings on different sides of each enclosed area.
- With a minimum of one FV for every 200 square feet (18.6 m²) of enclosed area, except that the SmartVENT® Stacking Model #1540-511 and FloodVENT® Stacking Model #1540-521 must be installed with a minimum of one FV for every 400 square feet (37.2 m²) of enclosed area.
- Below the base flood elevation.
- With the bottom of the FV located a maximum of 12 inches (305 mm) above the higher of the final

Top 15 Mistakes on FEMA Elevation Certificates:

6 of top 15 Mistakes on FEMA EC are in Sections B & C

- Not using FIS to determine BFE in Zone AE areas
- Mixing datum – choose datum of effective DFIRM
- Incorrect Datum Conversions between NGVD29 and NAVD88
- Not performing a tie-in to a BM when using GPS
- Failure to document Machinery & Equipment
- Leaving Spaces Blank – If it isn't applicable, put N.A.

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State
NEW HAVEN, CITY OF / 180004	ALLEN COUNTY	IN

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
18003C0340	H	Aug 3, 2009	Oct 2, 2013		

NATIONAL FLOOD INSURANCE PROGRAM

INSURANCE FP

PANEL 340 OF 495

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALLEN COUNTY	180302	0340	H
NEW HAVEN, CITY OF	180004	0340	H

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

MAP INDEX

FIRM

FLOOD INSURANCE RATE MAP

ALLEN COUNTY, INDIANA

AND INCORPORATED AREAS

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANELS PRINTED: 39, 40, 45, 63, 90, 95, 135, 140, 145, 155, 160, 165, 169, 170, 180, 185, 186, 187, 188, 189, 195, 205, 208, 215, 220, 230, 240, 241, 254, 260, 265, 270, 280, 281, 282, 283, 284, 286, 290, 291, 292, 293, 294, 305, 306, 307, 308, 309, 315, 320, 330, 335, 340, 345, 355, 365, 370, 380, 385, 387, 395, 405, 410, 415, 420, 430, 435, 440, 445, 455, 460, 465, 480, 490, 495

MAP REVISED AUGUST 3, 2009

MAP NUMBER 18003CIND0B

Maumee River Basin Commission

Federal Emergency Management Agency

Pre-FIRM vs. Post FIRM

Pre-FIRM building – Built before initial date of FIRM
Post-FIRM building – Built after initial date of FIRM

COMMUNITY NAME	COMMUNITY NUMBER	
ANGOLA, CITY OF	180244	
*ASHLEY, TOWN OF	180246	
CLEAR LAKE, TOWN OF	180247	
FREMONT, TOWN OF	180245	
HAMILTON, TOWN OF	180248	
HUDSON, TOWN OF	180249	
ORLAND, TOWN OF	180250	
STEUBEN COUNTY (UNINCORPORATED AREAS)	180243	**0015, 0020, 0040, 0145, 0155, 0160, 0-0260

*NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED
**PANEL NOT PRINTED

INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE
AUGUST 23, 1974	JUNE 17, 1986	DECEMBER 17, 2013
DECEMBER 17, 2013	DECEMBER 17, 2013	DECEMBER 17, 2013
DECEMBER 17, 2013	DECEMBER 17, 2013	DECEMBER 17, 2013
DECEMBER 17, 2013	DECEMBER 17, 2013	DECEMBER 17, 2013
SEPTEMBER 6, 1974	AUGUST 19, 1986	DECEMBER 17, 2013
DECEMBER 17, 2013	DECEMBER 17, 2013	DECEMBER 17, 2013
MAY 31, 1974	DECEMBER 17, 2013	DECEMBER 17, 2013
DECEMBER 27, 1974	JULY 3, 1986	DECEMBER 17, 2013

Impacts Flood Insurance Rating / Premium!

Comment should be made regarding date of construction, Effective FIRM and BFE at time of construction!

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State

B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/ Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth

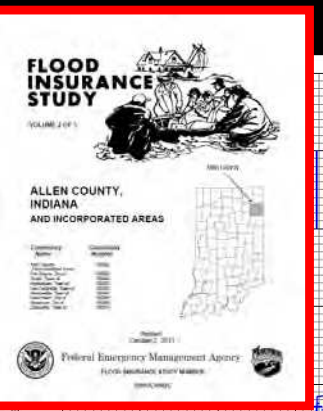
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9:

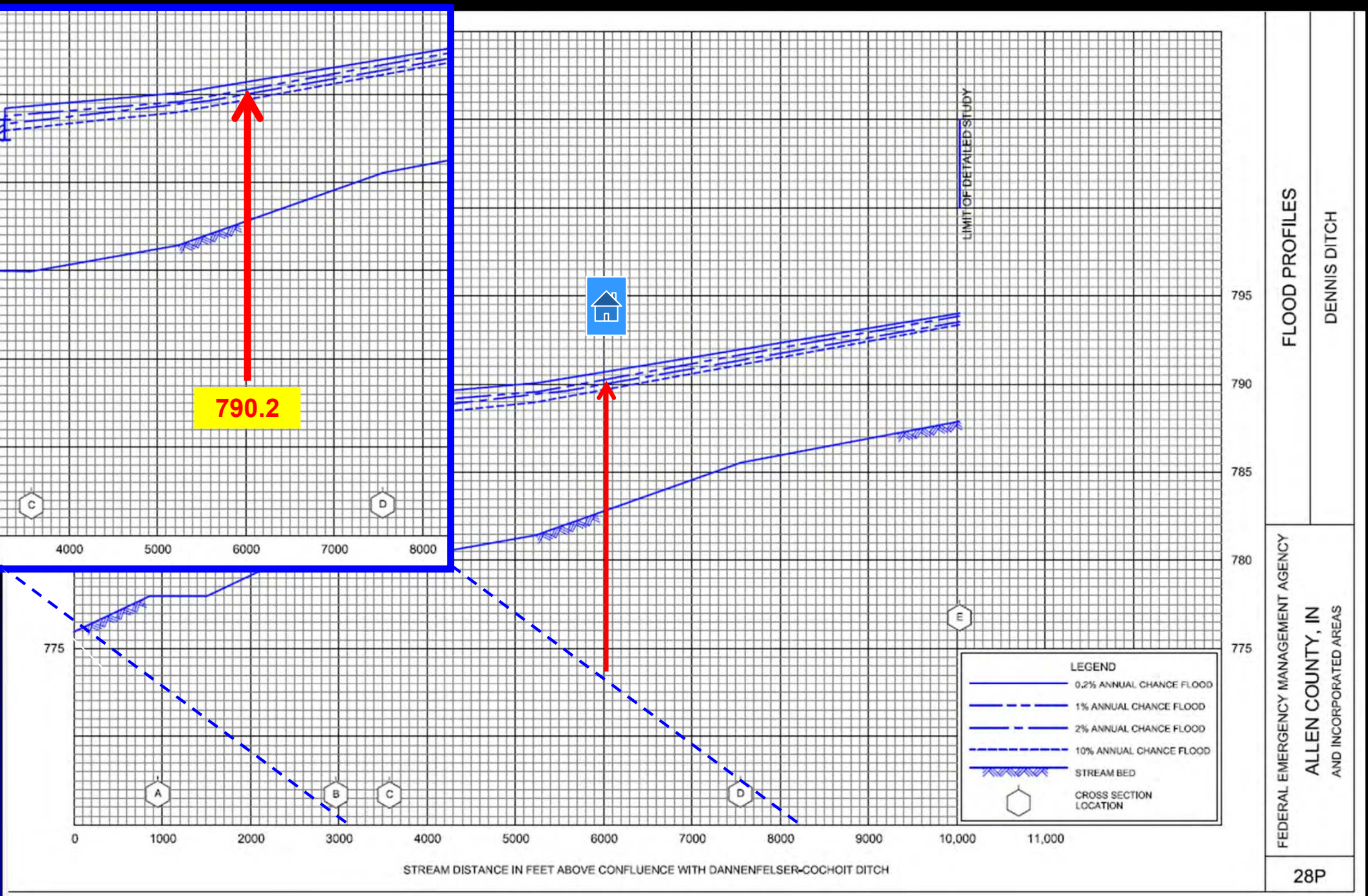
◯ FIS Profile ◯ FIRM ◯ Community Determined ◯ Other/Source: _____

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

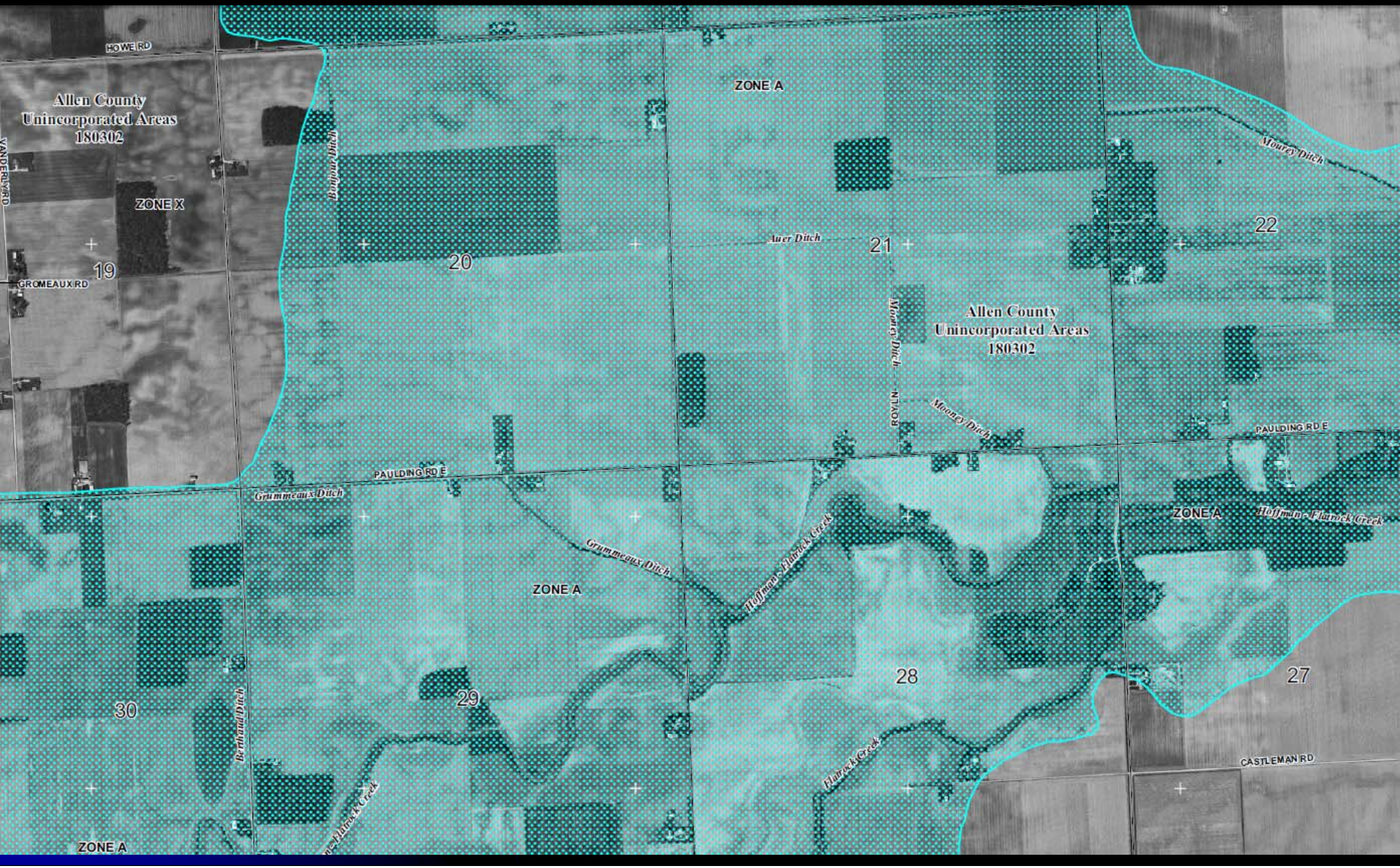
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ◯ Yes ◯ No

Designation Date: ◯ CBRS ◯ OPA




790.2
LIMIT OF DETAILED STUDY
795
790
785
780
775
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
A
B
C
D
E
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
11,000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH DANNENFELSER-COCHOIT DITCH
FLOOD PROFILES
DENNIS DITCH
FEDERAL EMERGENCY MANAGEMENT AGENCY
ALLEN COUNTY, IN
AND INCORPORATED AREAS
28P

Un-numbered “A”-Zone Everywhere!



Above 1 Square Mile Cut-off?

No BFE Data Available?

Submit Supporting Documentation with LOMC submittal including:

- Cross-sections
- Submit EC with note in Section B9 (Base Flood Elevation) stating:

“Not Available – see attached BFE Request”

Section C – Building Elevation Information

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

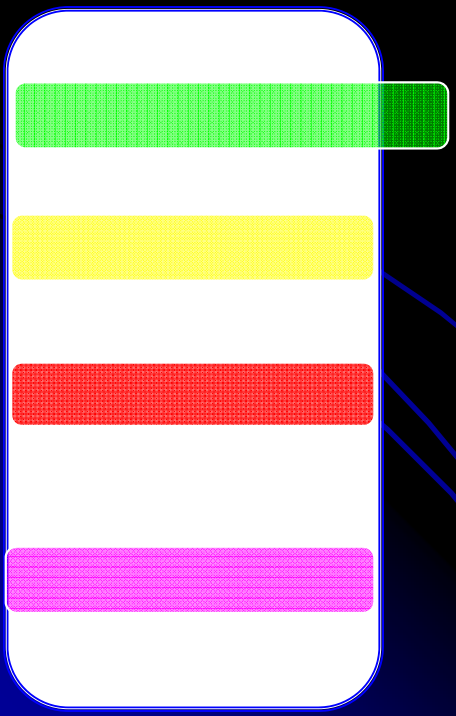
C2. Elevations - Zones A1 - A30, AE, AH, A (with BFE), VE, V1 - V30, V (with BFE), AR, AR/A, AR/AE, AR/A1 - A30, AR/AH, AR/AO. Complete Items C2.a -h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

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

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ◯ NGVD 1929 ◯ NAVD 1988

◯ Other/Source: _____



List identifier for BM – National Geodetic Survey uses the Permanent Identifier (PID).

For GPS survey, indicate BM used for the Base Station, the Indiana Continuously Operating Reference Stations (In-CORS) sites used for an On-line Positioning User Service (OPUS) solution (also attach the OPUS report), or the name of the Real Time Network used.

http://www.in.gov/dnr/water/3573.htm

Benchmark Information

http://www.ngs.noaa.gov/

Section C – Building Elevation Information

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

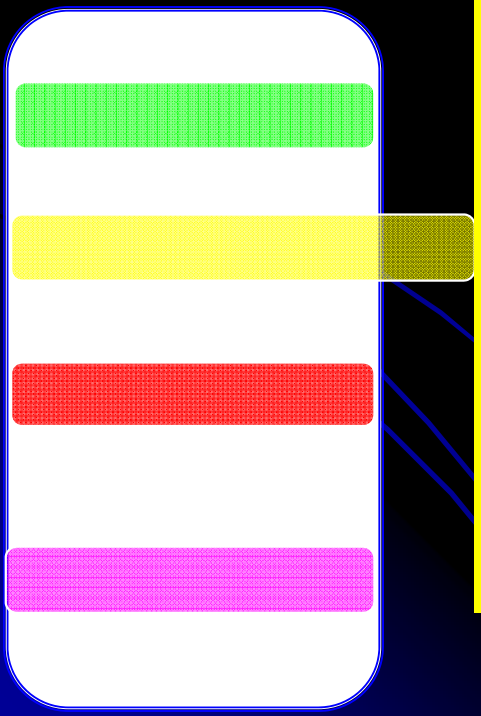
C2. Elevations - Zones A1 - A30, AE, AH, A (with BFE), VE, V1 - V30, V (with BFE), AR, AR/A, AR/AE, AR/A1 - A30, AR/AH, AR/AO. Complete Items C2.a -h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

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

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ◯ NGVD 1929 ◯ NAVD 1988

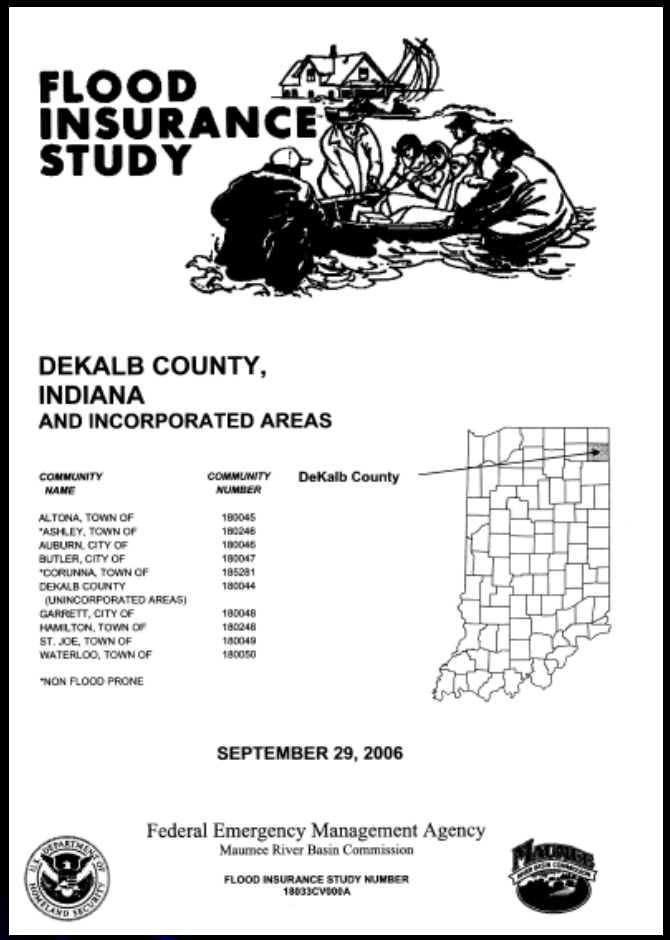
◯ Other/Source: _____



Provide Vertical Datum for the BM elevation.

ALL ELEVATIONS FOR THE CERTIFICATE, INCLUDING THOSE FOR ITEMS C2.a-h, **MUST USE THE SAME DATUM ON WHICH THE BFE IS BASED!!**

Surveyor must show the datum conversion in the "Comments Section" if applicable.



FLOOD INSURANCE STUDY

DEKALB COUNTY, INDIANA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
ALTONA, TOWN OF	180045
*ASHLEY, TOWN OF	180246
AUBURN, CITY OF	180046
BUTLER, CITY OF	180047
*CORUNNA, TOWN OF	185281
DEKALB COUNTY (UNINCORPORATED AREAS)	180044
GARRETT, CITY OF	180048
HAMILTON, TOWN OF	180248
ST. JOE, TOWN OF	180049
WATERLOO, TOWN OF	180050

*NON FLOOD PRONE

DeKalb County

SEPTEMBER 29, 2006

Federal Emergency Management Agency
Maumee River Basin Commission

FLOOD INSURANCE STUDY NUMBER
18033CV000A

Table 7. Vertical Datum Conversion

Quadrangle Name	NAD 27 Longitude (dec. deg.)	NAD 27 Latitude (dec. deg.)	NGVD 29 to NAVD 88 Elevation Change (feet)
ASHLEY	41.50	85.00	-0.479
AUBURN	41.25	85.00	-0.482
BUTLER WEST	41.38	84.87	-0.479
CORUNNA	41.38	85.13	-0.479
GARRETT	41.25	85.13	-0.486
HAMILTON	41.50	84.88	-0.476
SAINT JOE	41.25	84.87	-0.492
STROH	41.50	85.12	-0.466
WATERLOO	41.38	85.00	-0.479
		Min	-0.466
		Max	-0.492
		Average	-0.480
		Maximum Offset	0.012

Effective information fro this FIS report was converted from NGVD29 to NAVD88 Based on data presented in Figure 1 and Table 7. An average conversion of -0.480 feet (NGVD29 – 0.480 = NAVD88) was applied uniformly across the county to convert all Effective BFEs and other profile elevations.

Section C – Building Elevation Information

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

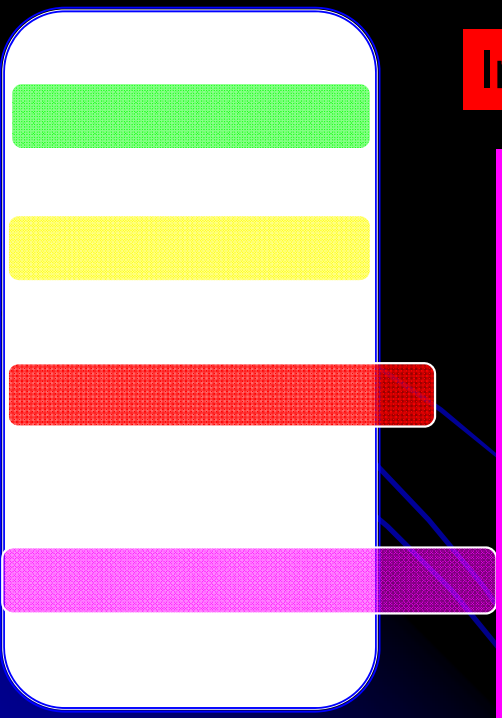
C2. Elevations - Zones A1 - A30, AE, AH, A (with BFE), VE, V1 - V30, V (with BFE), AR, AR/A, AR/AE, AR/A1 - A30, AR/AH, AR/AO. Complete Items C2.a -h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

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

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ◯ NGVD 1929 ◯ NAVD 1988

◯ Other/Source: _____



Indicate the elevation datum used for items C2.a-h.

When not using a BM by USGS or USC&GS that have a PID, list the BM used and the source.

EXAMPLES INCLUDE:

- IDNR BMs,
- INDOT BMs,
- LOCAL GOVERNMENT BMs, or
- OTHER.

Use the “Comments Section” to describe the BM used and the Source.

Section C – Building Elevation Information

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

Lowest Floor of Basement, Crawlspace, or Slab

Next higher Floor; generally the first living floor

Bottom of lowest "structural" member (V Zones only)

Elevation of top of Garage slab

Section C – Building Elevation Information

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

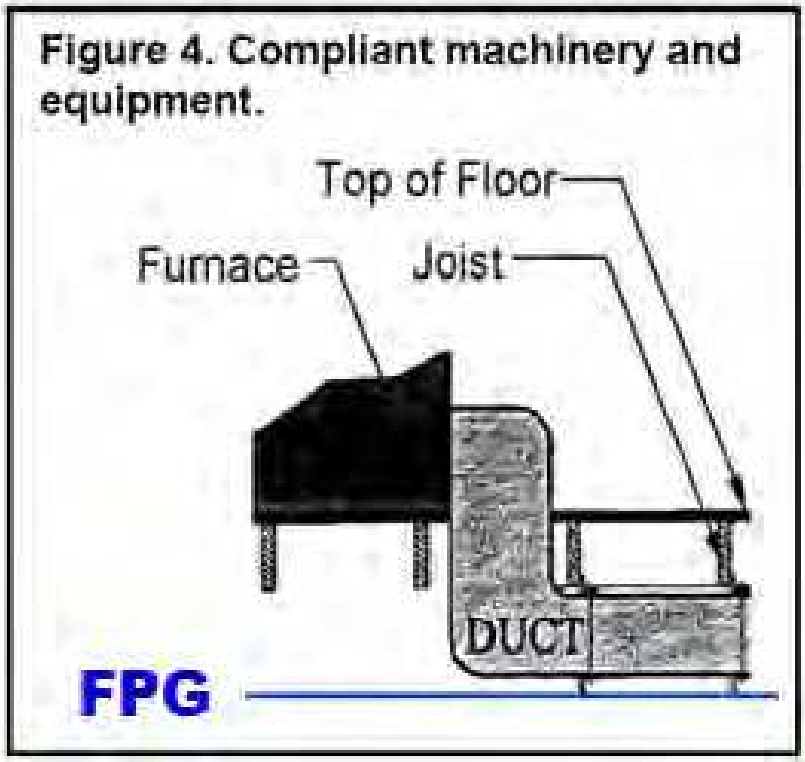
Lowest elevation of machinery or equipment – elevators, furnaces, hot water heaters, heat pumps, geo-thermal units, air conditioners INCLUDING DUCTWORK.

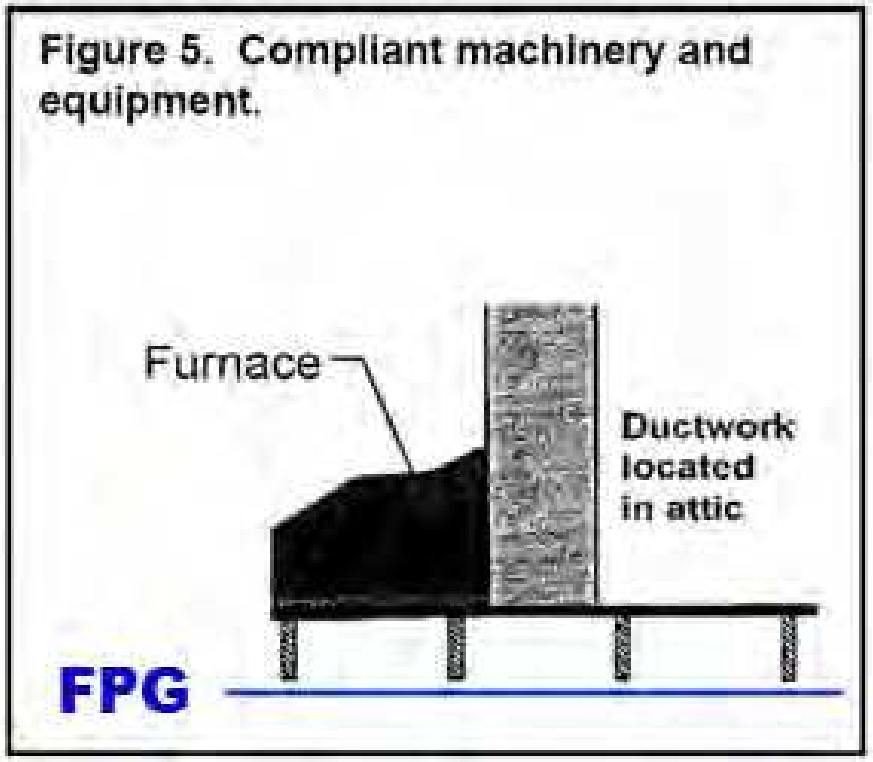
If elevated or attached to a wall, enter the platform elevation. Indicate machinery / equipment type and general location in the “COMMENTS SECTION”.

NOTE#1: These elevations are needed to rate the building for Flood Insurance.

NOTE #2: Local officials may require elevation information for ALL machinery & equipment including ductwork be noted on the Elevation Certificate to ensure that all machinery & equipment is protected from flooding.

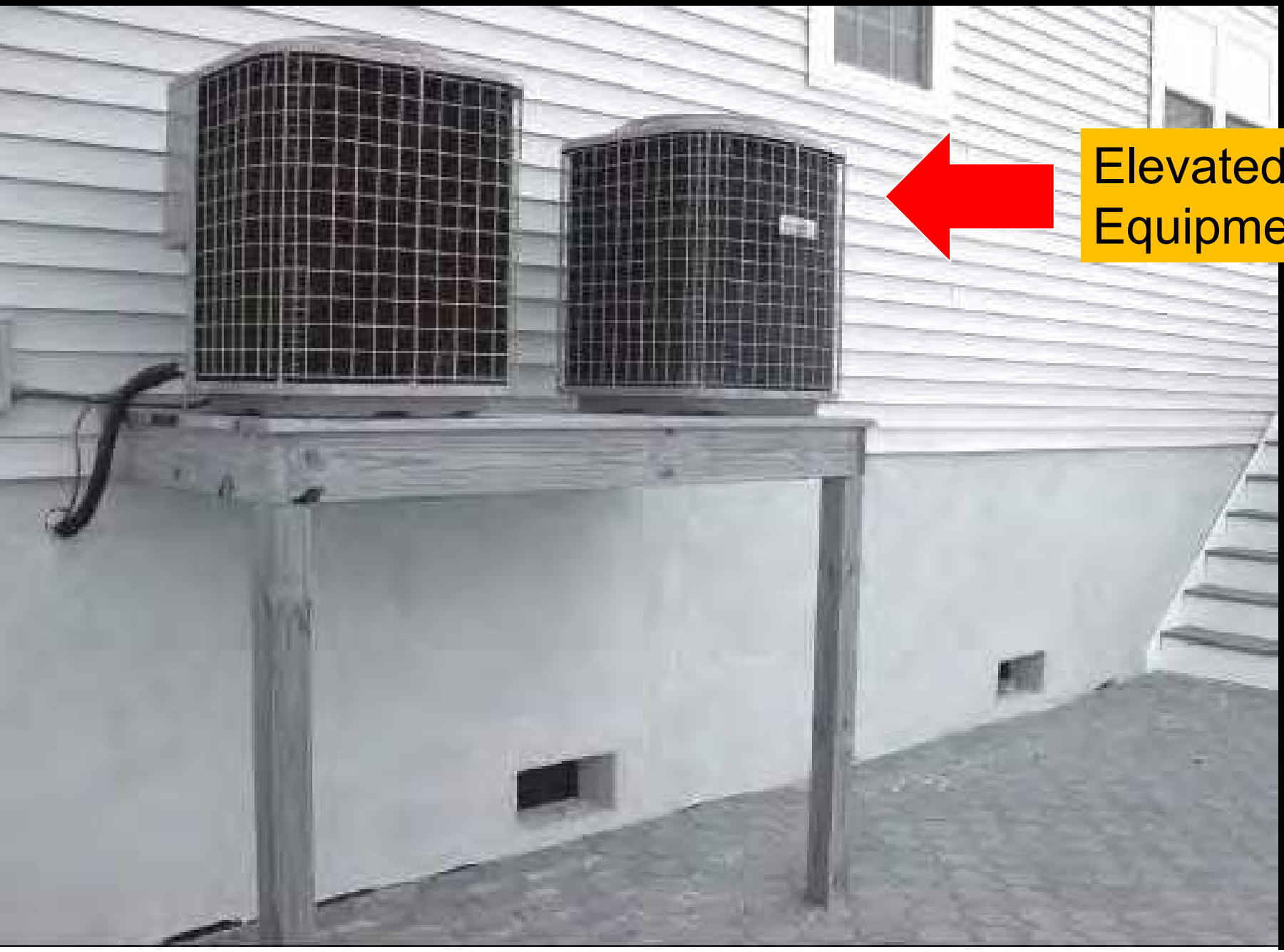
HVAC - Ductwork





HVAC ductwork located in Slab Foundation

Foundation Wall With Omitted Blocks



Section C – Building Elevation Information

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

Lowest ground elevation next to building. DO NOT encourage homeowners to add landscaping or fill to bring this elevation up above BFE!

Highest ground elevation next to building.

Lowest ground elevation at lowest elevation of deck or stairs, including structural support (IF ATTACHED TO STRUCTURE).

Impact of Elevation vs. Flood Insurance Premium

$158,600.00 Structure

Lowest Floor Below BFE

$40,000.00 Basic Coverage
$15,000.00 Contents Coverage

$1,084.00 Premium

Elevation	Premium
BFE +4’	$413
BFE +3’	$423
BFE +2’	$451
BFE +1’	$538
BFE +0’	$860
BFE -1’	$1769

Top 15 Mistakes on FEMA Elevation Certificates:

1 of top 15 Mistakes on FEMA EC is in Section D

- Not utilizing “Comments Section” and reporting pertinent information

SECTION D – SURVEYOR, ENGINEER CERTIFICATION

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 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

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

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

Signature	Date

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

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

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

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

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

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

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

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

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

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

Basically SECTION E is for property owners to fill out their own EC.

Note: LAG and HAG are not required; only notation indicating whether elevations are “ABOVE” or “BELOW” HAG and LAG

Notation must be made in Comments Section regarding whether measurements are based on “natural grade”.

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

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			

NOTE: Property owners (or their representative, unless a Licensed Surveyor) can only fill out Sections A, B, and E!

SECTION G – COMMUNITY INFORMATION (OPTIONAL)

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

Flood Protection Grade
BFE+2' feet

Local Official's Name Title

Community Name Telephone

Signature Date

Comments

Top 15 Mistakes on FEMA Elevation Certificates:

1 of top 15 Mistakes on FEMA EC is in regards to photographs

- Not including photographs

BUILDING PHOTOGRAPHS

BUILDING PHOTOGRAPHS

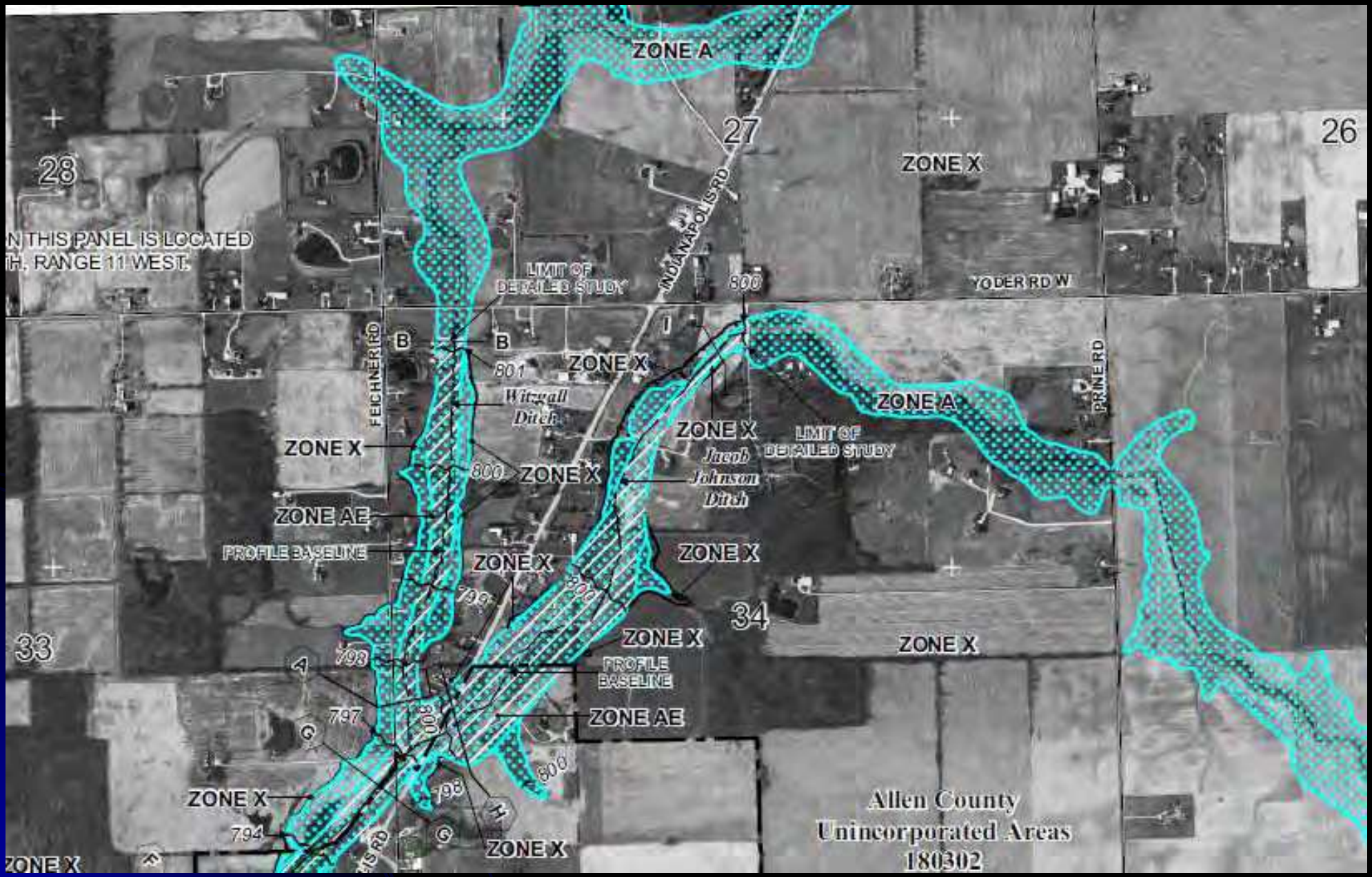
See instructions for Item A6

OMB Control Number: 1660-0008
Expiration: 11/30/2018

IMPORTANT: In these spaces, copy the corresponding information from Section A.	FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.	Policy Number:
City State Zip Code	Company NAIC Number:

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front view" and Rear view"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.

Understanding FEMA Mapping Process
Approximate Study, Limited Detail Study, & Detailed Study



Understanding FEMA Mapping Process
Hydrology – Hydraulic Modeling……. Accuracy - Precision

HYDROLOGY MODELING

- Watershed Area
- Watershed Slope
- Land Use
- Soil Type(s)
- Antecedent Moisture Condition
- Rainfall Distribution Type
- Local Rainfall Data
- Tc / Tt – Time of Concentration / Travel Time
- Rainfall Depths
- Storage
- Coordinated Discharge Rating Curve

NOTE: Changes in weather patterns, erosion, development, and encroachments (filling in floodplain) Are factors which can cause in increase in discharge values.

Understanding FEMA Mapping Process
Hydraulic – Hydrology…….. Accuracy - Precision

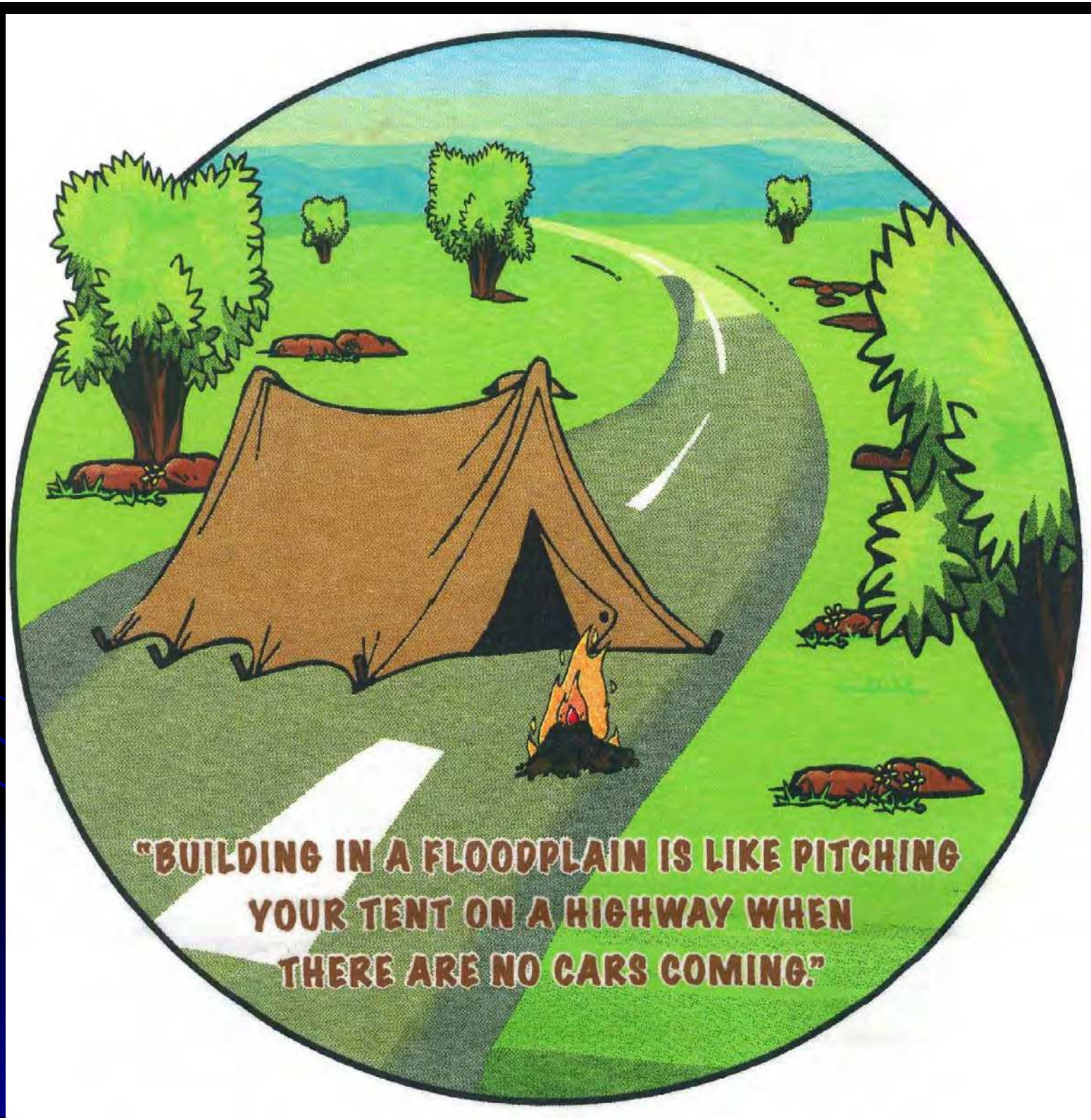
HYDRAULIC MODELING

- Discharge
- Channel Slope
- Channel Cross-sections (automated vs surveyed)
- Channel Roughness Coefficient
- Encroachments (bridges, culverts, & other structures)
- Backwater Controlled
- Headwater Controlled

Model Improvements

Hydraulic models can be calibrated by setting high water marks during major flooding events with the date and time documented. These high water marks are compared to the calculated water levels for the same time period and discharge. The Hydraulic model can be tweaked accordingly to improve the accuracy of the model.

#$%#..... Guess I should have listened when the Surveyor told me to build my home 3 1/2’ feet higher; I thought he was just blowing smoke!


"BUILDING IN A FLOODPLAIN IS LIKE PITCHING
YOUR TENT ON A HIGHWAY WHEN
THERE ARE NO CARS COMING."

CONTACT INFORMATION

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Email: rodr@mrbc.org