Ensuring Complete and Correct Elevation Certificates



Hardwood, administration international staticity		by the instructions of		14	upireton De	fa: July 31, 2015
						E COURANY USE
AL. Building Comerts Name	SECTION A-	PROPERTY INFO	RMATI		the Number	E CONFANT L'BE
2. Building Street Address (Including Apr., Un	it, Suba, and/or Bidg.		i Best No		riyang MAC N	- * -
0ty		2cate		2.0	Code	
A3. Property Description (Lot and Block Numb	ere, "ba Parcel Numbe	e Legal Geostipsion, e	ec.)			
A. Suiting Use is g. Carborch, Non-Sard A. Burthog Longitude IX. A. Arachine Langitude IX. A. Sarah Land 2 strong solution for the build A. Sarah Landrage Management of the King Salahing of the similation or works B. Salahing Angenetic Management D. Salahing Angenetic Management D. Salahing Angenetic Management D. Salahing and Salahing In Al- C. Salahing Salahing In Al- Salahing Salahing In Al- Salahing Salahing In Al- Salahing Salahing Salahing In Al- Salahing Salahing Salahing In Al- Salahing Salahing Salahing Salahing In Al- Salahing Salahing Salah	ing if the Carolinase in unaig() even(c)	being used to obtain	Forst 1) So 1) No 1) No	erance. Sulding with an actual water formige of erast wither of permanents the 1.0 formatione a	had garage: thad garage load apening dacers grade	
d Engineered food openings?	 C. Staniona and Stanioperings (24.8.4.5					
SECTIO	N 5 - FLOOD INSU	RANCE RATE MAI	r (mm	INFORMATION		
21. NPP Community Name & Community Num	ber	22. Courty Name				D. State
24. Nag/Panel Number 25. Suffix 24	C FRM Index Date	27. FRV Panel 2% Review) Date	cha/	28. Food Zone(4)	25. 23es 7 A0, um	bod Delation(e) (Zone base food depti)
211. Indicate elevation decum used for 245 in 1 212. In the building isocred in a Ossami Serie Designation Cross	Resources System (C			Conter/Source: _		Sa
SECTION	- BUILDING ELE	ATION INFORMAT	ion (s	URVEY REQUIRE	D)	
 Suiding elevations are based on: C NA new Devation Certificate will be require 	Construction Desving of when construction is	n Daviding i Frite building is comp	inder Os	nervelan"	Triahed Cor	an city
 Denstions - Zones AG-ADC, AZ, AA, A (wh C2.a-h below according to the building dis 	h BFE), NE, VS-HSO, N gram specified in Item	(side BFE), AR, AR/A, A7, in Puerts Riss o	AQUE,	AR/A1-A20, AR/AH, F MEDICE.	AR/(AD. Com	siete iteme
Berchmark United		Vertical Data				
Indicate elevation deturn used for the ele- Deturn used for building elevations must i	actions in harve a) thro to the same as that w	ugh Hjönick. 📑 10 ad for the RFS.	0 1929	Chark the men		
al Top of bottom foor /including basemen	- maintaine a second	and the second				40.
b) Top of the next higher foor				D two	Oreas	
c) Social of the lowest horizontal encountry	rai member (/ 20res)			- 0**		
c) Arached garage (top of eist) al. Lowest elevation of machinen or equip						
Describe tope of equipment and logic	on in Commerce)	0/4			- manage	
5 Lower adapted finished goals rains	s building (LAQ)	_				
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 Loven effecting side at loven elever anyonyal august. 	fon of deck or ateins,	NMP8	-	D***		
SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION						
The certification is to be eigend and easied by a land surveyor, engineer, or architect surfar/set by its to certify elevation						
Information, it surfly that the information are the Cardinase regression my beat efforts to there you the their sections. Excelorement that are these experiments may be purpleted by the primerization of the U.S. Cook, Section 2002.						
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-		- 24	_			SEAL

ELEVATION CERTIFICATE

Sponsored by: Southwestern Pennsylvania Commission (SPC) Water Resource Center May 2018



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- Tony Subbio, CFM
 - Emergency management and community resilience planner
 - Specializes in hazard mitigation and CRS
 Program services





- Elevation Certificate (EC) Basics
- The Elevation Certificate
- Common Elevation Certificate Errors
- Correcting Elevation Certificates
- Helpful Hints
- The Elevation Certificate
 Checklist
- Review an Elevation Certificate





Elevation Certificate Basics

- Purpose of the EC
 - Required to rate structures
 - Determine compliance with floodplain management regulations
 - Support Letters of map correction (LOMA/LOMR-F)
 - Prerequisite for the CRS
 - All new construction/substantial improvements must have a completed EC.
 - The ECs must be complete and "error-free"



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The Elevation Certificate (EC)

AND SEC	
FEMA	
NATIONAL FLOOD INSURANCE PROGRAM	
A MORAL I LOOD INSTRUCE I ROUKLN	
ELEVATION CERTIFICAT	8
AND	
INSTRUCTIONS	
2015 EDITION	





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The Current EC

- NFIP: EC not required
- CRS Program:
 - Permits issued after 7/2015 must use this form.
 - ECs must be 100% correct for CRS. (They will be audited.)
 - ECs must be based on *"finished"* construction
- Note-It is within the community's authority to not accept an incomplete or inaccurate EC.



Section A: Property Information

ELEVATION CERTIFICATE	
Important: Follow the instructions on pages 1-9.	
opy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insuran	ce agenticompany, and (3) building owne
SECTION A - PROPERTY INFORMATION	FOR INSURANCE COMPANY US
A1. Building Owner's Name	Policy Number:
 Building Street Address (including Apt., Unit, Suite, and/or Bidg. No.) or P.O. Route and Box No. 	Company NAIC Number:
City State	ZIP Code
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)	A
	atum: 🗌 NAD 1927 🔲 NAD 1983
A5. Latitude/Longitude: Lat. Long. Horizontal D	
A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in	
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) A5. Latitude/Longitude: Lat Long. Horizontal D A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s):	
AS. Latitude/Longitude: Lat. Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number	
A5. Latitude/Longitude: Lat Long. Horizontal D A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s): a) Square flootage of crawispace or enclosure(s) sq ft	isurance.
A5. Latitude/Longitude: Lat. Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a trawispace or enclosure(s): a) Square flootage of crawispace or enclosure(s) sq ft b) Number of permanent flood openings in the crawispace or enclosure(s) within 1.0 floot al	isurance.
A5. Latitude/Longitude: Lat Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s): a) Square footage of crawispace or enclosure(s) b) Number of permanent flood openings in the crawispace or enclosure(s) within 1.0 floot all c) Total net area of flood openings in A8.b sq in	isurance.
A5. Latitude/Longitude: Lat. Long. Horizontal D A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s): a) Square flootage of crawispace or enclosure(s) sq ft b) Number of permanent flood openings in the crawispace or enclosure(s) within 1.0 floot at	isurance.
A5. Latitude/Longitude: Lat Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s): a) Square footage of crawispace or enclosure(s) b) Number of permanent flood openings in the crawispace or enclosure(s) within 1.0 floot all c) Total net area of flood openings in A8.b sq in	isurance.
A5. Latitude/Longitude: Lat Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s): a) Square footage of crawispace or enclosure(s) sq ft b) Number of permanent flood openings in the crawispace or enclosure(s) within 1.0 foot al c) Total net area of flood openings in A8.b sq in d) Engineered flood openings? Yes No	isurance.
A5. Latitude/Longitude: Lat Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawlspace or enclosure(s): a) Square footage of crawlspace or enclosure(s) b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 floot at c) Total net area of flood openings in A8.b sq in d) Engineered flood openings? Yes A9. For a building with an attached garage:	tove adjacent grade
A5. Latitude/Longitude: Lat Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawispace or enclosure(s): a) Square footage of crawispace or enclosure(s) sq ft b) Number of permanent flood openings in the crawispace or enclosure(s) within 1.0 foot al c) Total net area of flood openings in A8.b sq ft d) Engineered flood openings? Yes No A9. For a building with an attached garage: sq ft	tove adjacent grade
A5. Latitude/Longitude: Lat Long. Horizontal D A5. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood in A7. Building Diagram Number A8. For a building with a crawlspace or enclosure(s): a) Square footage of 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 al 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 sq ft b) Number of permanent flood openings in the attached garage within 1.0 foot above adjace	tove adjacent grade

Section A - EC Vocabulary

Crawlspace

RA TECH

A crawlspace is an under-floor space that has its interior floor area (finished or not) no more than 5 feet below the top of the next-higher floor. Crawlspaces generally have solid foundation walls.





Section A - EC Vocabulary

Subgrade Crawlspace

A subgrade crawlspace has its interior floor no more than 5 feet below the top of the next higher floor and no more than 2 feet below the lowest adjacent grade. Basically, it is a crawlspace that has a portion located 2 feet or less below ground.





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Enclosure

TETRA TECH

That portion of an elevated building below the lowest elevated floor that is either partially or fully shut in by rigid walls. below the Base Flood Elevation (BFE) may only be used for building access, vehicle parking, and storage.



Section A - EC Vocabulary

Flood Openings

Proper flood openings allow floodwaters to pass into and out of an enclosure, helping to minimize risk when it comes to rating the elevated building for flood insurance.

- Requirements
 - Designs certified by a registered professional engineer or architect

-OR-

2+ openings on 2+ walls

Not higher than 1 foot above grade



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Net area not less than 1 in² for – every 1 ft² of enclosed area

 Operate automatically with no human activation needed

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Section A - EC Vocabulary

 See https://www.fema.gov/medi a-library-data/20130726-1502-20490-9949/fema tb 1 1 .pdf



Openings in Foundation Walls and Walls of **Enclosures**

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

Technical Bulletin 1 / August 2008







Where are the vents???



Section A-8: Crawlspace openings

• The height of flood openings can be determined from the interior grade or floor.



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A-9: Attached Garage

- A basement garage is not considered an attached garage.
- It is a lateral attachment, not including attachment by a breezeway.
- If there is no attached garage, enter "N/A" in all three spaces. If there is an attached garage and there are no openings, the correct entry is "zero," even if the garage is above the BFE.





Section B: FIRM Information

For CRS Purposes, the following sections are mandatory fields:

B1:NFIP community name/community number.

B4: Map AND panel number.

B5: Panel number suffix.

- **B7: FIRM panel effective/revised date.**
- B8: Flood zone(s) in which the building is located.

B9: Base flood elevation(s).

B10: The source of the base flood elevation data

B11: The elevation datum

B12: Whether the building is located in a Coastal Barrier Resources System

B1. NFIP Community Name & Community Number Green Tree, Borough of (420040)				B2. County Na	B3. State PA		
B4. Map/Panel Number	B5. Suffix B6. FIRM Index B7. F Date B7.		87. FI	RM Panel ective/ vised Date	Allegheny B8. Flood Zone(s)	(20)	e Flood Elevation(s) te AO, use Base td Depth)
42003C 0337	н	H 02/17/1989		/26/2014	AE	822.0	
FIS Prof		Community Deter	mined	Cther/Source	E		
B11. Indicate elev	vation datum u	sed for BFE in item E	99: 🔲 NG	IVD 1929 🔀	Sector Sector	r/Source:)PA)? 🗌 Yes 🗶 N





For CRS purposes:

🗸 C1

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✓ All items under C2 are required to have an entry.

**Note-Select "finished construction" only when all machinery and/or equipment furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment—have been installed and the grading around the building is completed.

ELEVATION CERTIFICATE	OMB No. 1660-00 Expiration Date: N	008 November 30, 2018			
IMPORTANT: In these spaces, copy the o	FOR INSURANCE COMPANY USE				
Building Street Address (including Apt., Un	Policy Number:				
City	State	ZIP Code	Company NAIC	Number	
SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)					
C1. Building elevations are based on:	Construction Drawings"	Building Under Constr	uction" 🔄 Finist	hed Construction	
A new Elevation Certificate will be n	quired when construction of th	e building is complete.			
C2. Elevations – Zones A1–A30, AE, AH Consiste literation C2 and balance account					
Complete Items C2.a-h below accor Benchmark Utilized:	Vertical		to Rico only, enter	meters.	
Indicate elevation datum used for the					
NGVD 1929 NAVD 19		ny below.			
Datum used for building elevations m		or the BFE.			
_			Check the me	easurement used.	
 Top of bottom foor (including bas 	ement, crawispace, or enclosu	re floor),	feet	meters	
b) Top of the next higher floor			feet	meters	
c) Bottom of the lowest horizontal st	ructural member (V Zones only)	feet	meters	
d) Attached garage (top of slab)			feet	meters	
 e) Lowest elevation of machinery or (Describe type of equipment and 		na	feet	meters	
f) Lowest adjacent (inished) grade	next to building (LAG)	· · · · ·	feet	meters	
g) Highest adjacent (finished) grade	next to building (HAG)		feet	meters	
 h) Lowest adjacent grade at lowest of structural support 	elevation of deck or stairs, inclu	ding,	feet	meters	

Section C - EC Vocabulary

Finished Construction

"Finished Construction" applies only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the finished grading around the building is completed.



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Section C - EC Vocabulary

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Basement

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Any area of the building, including any sunken room or sunken portion of a room, having its floor below ground level (subgrade) on all sides.





Section C - EC Vocabulary

Lowest Floor

TETRA TECH

The floor of the lowest enclosed area (including a basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor provided that such enclosure is not built so as to render the structure in violation of requirements.





Section C – EC Vocabulary

Lowest horizontal structural member

If the building you are rating is in a V zone, you will need the elevation of the bottom of the lowest horizontal structural member or C2.c. Many times, this is the bottom of a support beam that runs beneath an elevated building and braces it.







Section C – EC Vocabulary

Machinery/Equipment

Utilities and their associated equipment. Includes but is not limited to:

- elevators
- Furnaces
- hot water heaters
- heat pumps
- Electrical service panel
- Yes, this includes "duct work!





Section C – EC Vocabulary

Grade level

TETRA TECH

There are two measurements associated with grade level: the highest adjacent grade (HAG) next to the building (Item C2.g on the EC) and lowest adjacent grade (LAG) (Item C2.f on the EC).





Building Types

There are three types of buildings represented in the diagrams on the EC.

1. Slab-on-Grade

2. Buildings with basements

3. Buildings with elevated foundations



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Diagram #IA

DIAGRAM 1A

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

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





Diagram # IA





Diagram #IB

DIAGRAM 1B

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

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







Diagram #IB









Diagram # 1

1A

A7. Building Diagram Number

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

774.0

IMPO	RTANT: In these spaces, copy the corresponding information from Section	FOR INSURANCE COMPANY USE Policy Number:		
Build	ing Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route			
City	State ZIP C	ode	Company NAIC I	Number
	SECTION C - BUILDING ELEVATION INFORMATIO	ON (SURVEY R	EQUIRED)	
	Building elevations are based on: Construction Drawings* Buildi *A new Elevation Certificate will be required when construction of the building Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE			ned Construction
02.	Complete Items C2.a–h below according to the building diagram specified in Benchmark Utilized: RM-32 Vertical Datum:		to Rico only, enter	
	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 BF		Check the me	easurement used.
	a) Top of bottom floor (including basement, crawlspace, or enclosure floor) .	775.25	feet	meters
	b) Top of the next higher floor	<u>N/A</u>	feet	meters
	c) Bottom of the lowest horizontal structural member (V Zones only)	N/A	feet	meters
	d) Attached garage (top of slab)	<u>N/A</u>	feet	meters
	e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	780.5	feet	meters
	f) Lowest adjacent (finished) grade next to building (LAG)	774.0	✓ feet	meters
	g) Highest adjacent (finished) grade next to building (HAG)	774,65	✓ feet	meters
	 h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support 	N/A	feet	meters



Let's Take a Break!



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Buildings with Basements Diagram #2-4





Diagram #2A





Diagram #2B

DIAGRAM 2B

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

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





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CENTER

Diagram #2

A7. Building Diagram Number

B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 774.00

	SECTION C – BUILDING ELEVATION INFORMATIO	ON (SURVEY REC	UIRED)
C1.	Building elevations are based on: Construction Drawings* Building *A new Elevation Certificate will be required when construction of the building	•	ion* Finished Construction
C2.	Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE Complete Items C2.a–h below according to the building diagram specified in Benchmark Utilized: RM-32 Vertical Datum:		
	Indicate elevation datum used for the elevations in items a) through h) below. NGVD 1929 INAVD 1988 Other/Source: Datum used for building elevations must be the same as that used for the BF		Check the measurement used
	a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	768.80	Check the measurement used.
	b) Top of the next higher floor	776.0	feet meters
	c) Bottom of the lowest horizontal structural member (V Zones only)	<u>N/A</u>	feet meters
	d) Attached garage (top of slab)	774,80	feet meters
	e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	769.50	feet meters
	f) Lowest adjacent (finished) grade next to building (LAG)	774.0	feet 🔲 meters
	g) Highest adjacent (finished) grade next to building (HAG)	775.10	feet meters
	h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	N/A	feet meters

2

Diagram #3












	Diagram #3	3		
A7	. Building Diagram Number3		B9. Base F (Zone A Flood D	lood Elevation(s) AO, use Base Depth) 774.0
	SECTION C – BUILDING ELEVATION INFORMATIO	ON (SURVEY REQUI	RED)	
C1.	Building elevations are based on: Construction Drawings* Building *A new Elevation Certificate will be required when construction of the building	•	🖌 Finisł	ned Construction
C2.	Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE Complete Items C2.a–h below according to the building diagram specified in Benchmark Utilized: <u>RM-32</u> Vertical Datum: Indicate elevation datum used for the elevations in items a) through h) below.	Item A7. In Puerto Rico NAVD 88		
	□ NGVD 1929 ✓ NAVD 1988 □ Other/Source: Datum used for building elevations must be the same as that used for the BF	Ε.	heck the me	easurement used
	a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	773,25	feet	meters
	b) Top of the next higher floor	775,60	feet	meters
	c) Bottom of the lowest horizontal structural member (V Zones only)	N/A	feet	meters
	d) Attached garage (top of slab)	774,75	feet	meters
	e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	773.8	feet	meters
	f) Lowest adjacent (finished) grade next to building (LAG)	772.50	feet	meters
	g) Highest adjacent (finished) grade next to building (HAG)	774.5	feet	meters
		N/A.		meters

DIAGRAM 4

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

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













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Diagra	am #4
A7. Building Diagram Number 4	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 774.0
SECTION C – BUILDING ELEVATIO	IN INFORMATION (SURVEY REQUIRED)
A new Elevation Certificate will be required when constructi C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1– Complete Items C2.a–h below according to the building diag	ngs Building Under Construction* Finished Construction on of the building is complete. V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. gram specified in Item A7. In Puerto Rico only, enter meters. /ertical Datum: NAVD 88
Indicate elevation datum used for the elevations in items a) t NGVD 1929 NAVD 1988 Other/Source: Datum used for building elevations must be the same as tha	
a) Top of bottom floor (including basement, crawlspace, or ob) Top of the next higher floor	
 c) Bottom of the lowest horizontal structural member (V Zor d) Attached garage (top of slab) 	nes only) N/A Get meters
 e) Lowest elevation of machinery or equipment servicing the (Describe type of equipment and location in Comments) 	e building 765.00 v feet meters
f) Lowest adjacent (finished) grade next to building (LAG)	772.5 / feet in meters
g) Highest adjacent (finished) grade next to building (HAG)	774,1 🗹 feet 🗌 meters
h) Lowest adjacent grade at lowest elevation of deck or stai	rs. including N/A feet meters

Elevated Buildings Diagram #5-9





Building Elevation Vocabulary

Elevated Building

FEMA defines an elevated building as one that:

- 1. Has no basement, and
- 2. Has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns





ETRA TECH













TET TET	TRA TECH		
	Diagram #	5	
A7	. Building Diagram Number 5	lood Zone(s) VE	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 48.00
	SECTION C - BUILDING ELEVATION INFORMATIO	ON (SURVEY REQ	UIRED)
C1.	Building elevations are based on: Construction Drawings* Building *A new Elevation Certificate will be required when construction of the building		on* Finished Construction
C2.	Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE Complete Items C2.a–h below according to the building diagram specified in Benchmark Utilized: <u>RM-10</u> Vertical Datum:), AR, AR/A, AR/AE	
	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 BF		Check the measurement used.
	a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	49.50	_ feet _ meters
	b) Top of the next higher floor	N/A	feet meters
	c) Bottom of the lowest horizontal structural member (V Zones only)	48.5	feet meters
	d) Attached garage (top of slab)	N/A	feet meters
	e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	42.65	feet meters
	f) Lowest adjacent (finished) grade next to building (LAG)	42.45	feet meters
	g) Highest adjacent (finished) grade next to building (HAG)	42.50	feet meters
	h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	42.50	feet meters

WATER RESOURCE CENTER

DIAGRAM 6

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

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

















DIAGRAM 7

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

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











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	Diagram 7	#7	
A7. Building Dia B8. Flood Zone(s) AE	a) Square footage of crawispace o b) Number of permanent flood ope (Zone AO, use Base Flood Depth) 2352.00 c) Total net area of flood openings	r enclosure(s) 2000 s nings in the crawlspace or enclosure	q ft a(s) within 1.0 foot above adjacent grade <u>18</u>
	SECTION C - BUILDING ELEVATION INFORMA	TION (SURVEY REC	QUIRED)
Complete Ite Benchmark Indicate elev	Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with Beens C2.a–h below according to the building diagram specified Utilized: <u>RM-7</u> Vertical Datum vation datum used for the elevations in items a) through h) below GVD 1929 ✓ NAVD 1988 Other/Source:	in Item A7. In Puerto	Rico only, enter meters.
	for building elevations must be the same as that used for the l		Check the measurement used.
	ottom floor (including basement, crawlspace, or enclosure floor ine next higher floor	r) <u>2347.60</u> <u>2354.00</u>	feet meters
c) Bottom o	f the lowest horizontal structural member (V Zones only) I garage (top of slab)	N/A	feet meters
e) Lowest e	elevation of machinery or equipment servicing the building type of equipment and location in Comments)	2354.00	feet meters
f) Lowest a	idjacent (finished) grade next to building (LAG)	2347.40	feet meters
g) Highest a	adjacent (finished) grade next to building (HAG)	2348.10	feet meters
h) Lowest a structural	djacent grade at lowest elevation of deck or stairs, including	N/A	feet meters

DIAGRAM 8

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

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











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	Diagram #8			
A7. Building Diagram Number 8 B8. Flood Zone(s) B9. Base Flood Elevation(s) (Zone AO, use Base	 A8. For a building with a crawlspace or en a) Square footage of crawlspace or en b) Number of permanent flood opening 	nclosure(s) 1250	sq ft re(s) within 1.0 foot above adjacent grade	2
AE Flood Depth) 789				<u> </u>
	 c) Total net area of flood openings in a d) Engineered flood openings? 	A8.0 1440 sq in Yes No		
SECTION C - BUILD	ING ELEVATION INFORMATIO	ON (SURVEY RE	QUIRED)	
 C1. Building elevations are based on: □ Col *A new Elevation Certificate will be required C2. Elevations – Zones A1–A30, AE, AH, A (with Complete Items C2.a–h below according to Benchmark Utilized: <u>RM-14</u> Indicate elevation datum used for the elevation NGVD 1929 NAVD 1988 □ 	when construction of the building h BFE), VE, V1–V30, V (with BFE the building diagram specified in Vertical Datum: ions in items a) through h) below.	E), AR, AR/A, AR/A Item A7. In Puerto NAVD 8	E, AR/A1–A30, AR/AH, AR/AC Rico only, enter meters.	
Datum used for building elevations must be		E.		_
a) Top of bottom floor (including basement,	crawlspace, or enclosure floor)	788,2	Check the measurement us	ed.
b) Top of the next higher floor		790,5	feet meters	
c) Bottom of the lowest horizontal structural	I member (V Zones only)	N/A	feet meters	
d) Attached garage (top of slab)		788,2	feet meters	
 e) Lowest elevation of machinery or equipm (Describe type of equipment and location) 	nent servicing the building . n in Comments)	790.8	feet meters	
f) Lowest adjacent (finished) grade next to	building (LAG)	788.5	feet meters	
g) Highest adjacent (finished) grade next to	building (HAG)	789.0	feet meters	
 h) Lowest adjacent grade at lowest elevation structural support 	on of deck or stairs, including .	<u>N/A</u>	feet meters	

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DIAGRAM 9

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

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

















IMPORTANT NOTE

- If you are going to permit subgrade crawlspaces in the floodplain, you need to make sure that your floodplain management ordinance:
 - 1. Defines "crawlspace"
 - 2. Includes the 4 provisions of FEMA's "Technical Bulletin 11-01: Crawlspace Construction for Buildings Located in Special Flood Hazard Areas."
- If the crawlspace does not meet the TB 11-01 requirements, it is a basement (Diagram 2, not Diagram 9)!



Technical Bulletin

Crawlspace Construction

for Buildings Located in Special Flood Hazard Areas National Flood Insurance Program Interim Guidance FEMATB-11 / November 2001





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TETRA TECH	Dia	agram #9			
A7. Building Dia		A8. For a building with a crawlspace or enda) Square footage of crawlspace or end		sq ft	
B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth)	b) Number of permanent flood opening	as in the crawlspace or enclos	ure(s) within 1.0 foot above ac	djacent grade 12
AL	789	c) Total net area of flood openings in A	A8b 1440 sq in		
			/es No		
	SECTION C - BUILDIN	IG ELEVATION INFORMATIC	ON (SURVEY RE	QUIRED)	
	ations are based on: Cons tion Certificate will be required w		ng Under Construe is complete.	ction* 🗹 Finish	ned Construction
	Zones A1–A30, AE, AH, A (with ms C2.a–h below according to th Itilized: <u>RM-14</u>			Rico only, enter	
	ation datum used for the elevation				
_	VD 1929 VD 1988 (0) or building elevations must be th		Ε.	district of the	
					easurement used.
a) Top of bot	tom floor (including basement, c	rawlspace, or enclosure floor) _	<u>788</u> ,2	feet	meters
b) Top of the	e next higher floor		793,5	feet	meters
c) Bottom of	the lowest horizontal structural n	nember (V Zones only)	<u>N/A</u>	feet	meters
d) Attached	garage (top of slab)	-	<u> </u>	feet	meters
e) Lowest ele (Describe	evation of machinery or equipme type of equipment and location i	nt servicing the building n Comments)	<u>790,8</u>	feet	meters
f) Lowest ad	ljacent (finished) grade next to b	uilding (LAG)	788.5	feet	meters
g) Highest ad	djacent (finished) grade next to b	uilding (HAG)	789.0	feet	meters
h) Lowest ad structural	ljacent grade at lowest elevation support	of deck or stairs, including	N/A	feet	meters

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Any Questions?



		imprisonment under 1911 S. Cod	This certification is to be signed and s I certify that the information on this Ce statement may be punishable by fine
Check here if attachme			Were latitude and longitude in Section
	ber	License Numb	Certifier's Name
Place Seal Here	Title Company Name		
			Address
	ZIP Code	State	City
	Telephone	Date	Signature
company, and (3) building	nunity official, (2) insurance age	e and all attachments for (1) comm	Copy all pages of this Elevation Certific
com	Telephone	Date	Signature

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).

meters

meters

meters

feet meters

feet

feet

feet

- a) Top of bottom floor (including basement, crawlspace, or enclosure) is
- b) Top of bottom floor (including basement, crawlspace, or enclosure) is
- 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

E4. Top of platform of machinery and/or equipment servicing the building is

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.



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above or below the HAG.

above or below the LAG.

above or below the HAG.

above or below the HAG.



Section F - Property Owner (or Owner's Representative) Certification

	SECTION F - PROPERT	Y OWNER (OR OWNER'S REPRESE	NTATIVE) CERTIFICATIO	N
The property own community-issued	ner or owner's authorized repres d BFE) or Zone AO must sign h	sentative who completes Sections A, B here. The statements in Sections A, B,	and E for Zone A (withour and E are correct to the be	t a FEMA-issued or st of my knowledge.
Property Owner of	or Owner's Authorized Represer	ntative's Name		
Address		City	State	ZIP Code
Signature		Date	Telephone	
Comments				
	-	easurements owner or repr	•	



Section G - Community Information

 ✓ If G1 or G2 is checked, then the first and third lines after G10 (the local official's name and signature) must be completed.

✓ NOTE: If a local official authorized by law to complete an Elevation Certificate fills out ALL the information (including elevation data), then G8, G9, and the signature block must be completed.

S	ECTION G - COMMUNITY INFORMATION	(OPTIONAL)		
	vation Certificate. Complete the applicable it	floodplain management ordinance can complete em(s) and sign below. Check the measurement		
G1. The information in Section C was taken from other documentation that has been signed and sealed by a licensed surve engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elev 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 Bi or Zone AO.				
G3. The following information (Item	s G4–G10) is provided for community floodp	lain 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 Im	provement		
G8. Elevation of as-built lowest floor (in of the building:	cluding basement)	feet meters		
G9. BFE or (in Zone AO) depth of flood	ng 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 a	and location, per C2(a) if applicable)			
sommerne (moldanig type of equipment t				
		Check berg if attachments		



Building Photographs



 Photographs are required for insurance rating.

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- At least two photographs, showing at least the front and rear of the building.
- Help confirm values in Section C.
- The photos are not required for CRS compliance.

		HOTOGRAPHS	OMB No. 1660-0008	
LEVATION CERTIFICATE		ons for Item A6.	Expiration Date: November 30, 201	
MPORTANT: In these spaces, copy the c Building Street Address (including Apt., Unit			FOR INSURANCE COMPANY US Policy Number:	
Suiding Street Address (including Apr., Oni	r, Suite, and/or Bidg. No.) or P.O. Route and Box No.	Policy Number.	
City	State	ZIP Code	Company NAIC Number	
If using the Elevation Certificate to obta instructions for Item A6. Identify all photog "Left Side View." When applicable, photo vents, as indicated in Section A8. If submit	raphs with date taken; "F graphs must show the	Front View" and "Rear View"; foundation with representation	and, if required, "Right Side View" and ve examples of the flood openings or	
	Phot	to One		
	_			
Photo One Caption	Pho	to One		
	Phot	to Two		
	-	to Two		
Photo Two Caption	Pho	ND IWO		



Any Questions?





Section A

 A3- property Legal Description-Proper Parcel # or legal description from Deed.
 Diagram #
 Blank fields in A8 and A9.

Providing backup documentation on engineered flood vents



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Common EC Errors

Section B

Wrong NFIP #-Must list community name and NFIP # in B1

Wrong index dates

➢Item B-10: Where did the BFE come from, especially in unnumbered "A" zones



Common EC Errors

Section C

- Understanding the distinguishing features of each diagram #
- **Definition of finished construction.**
- ➢Information certified in C2(a-g) does not support diagram # used.
- **No entry for C2e (machinery and equipment)**
- **Leaving field blank instead of using NA.**



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Correcting Elevation Certificates

Do not mark EC with corrections!!

Section "B" errors

- Send back to the surveyor
- Separate memo attached to EC from Local Official
- Note changes in comments section

Bad elevations and section "C" errors

- Send back to the original surveyor
 - Do a new elevation certificate
- Use a different surveyor

Helpful hints

- Make a "complete and correct" EC a condition for certificate of occupancy.
- Never assume the EC was filled out correctly because it has the seal on it.
- Establish a review process that determines if the EC is complete and correct.
- Fill out as much of the EC as you can at the time of the permit application (i.e.: section A and B).



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Review an Elevation Certificate

S. DEPARTMENT OF HOMELAND SECURITY deral Emergency Management Agency tional Flood Insurance Program		lo. 1660-0008 tion Date: November 30, 2018
ELEVATION CER Important: Follow the instructions		
py all pages of this Elevation Certificate and all attachments for (1) community	official, (2) insurance agent/co	mpany, and (3) building owner.
SECTION A – PROPERTY INFORMATION		NSURANCE COMPANY USE
A1. Building Owner's Name	Policy	Number:
 Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or I Box No. 	P.O. Route and Comp	any NAIC Number:
City State	ZIP C	ode
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Lega	I Description, etc.)	
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.	c.)	
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 us		—
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(nt grade
c) Total net area of flood openings in A8.bsq 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 ir	1	
d) Engineered flood openings? Yes No		
SECTION B – FLOOD INSURANCE RATE M	AP (FIRM) INFORMATION	
B1. NFIP Community Name & Community Number B2. County N	ame	B3. State
		ood Elevation(s) O, use Base Flood Depth)
B10. Indicate the source of the Base Flood Elevation (BFE) data or base floo FIS Profile FIRM Community Determined Other/Source		
B11. Indicate elevation datum used for BFE in Item B0: NGVD 1920		uree:

Replaces all previous editions.

Designation Date: CBRS OPA

FEMA Form 086-0-33 (7/15)

Form Page 1 of 6







Final Questions?









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 - -tony.subbio@tetratech.com

