
Builders Part 2
Karol L. Grove, PS, CFM

Zone AE or A1-A30
Studied Area- Known Elevation

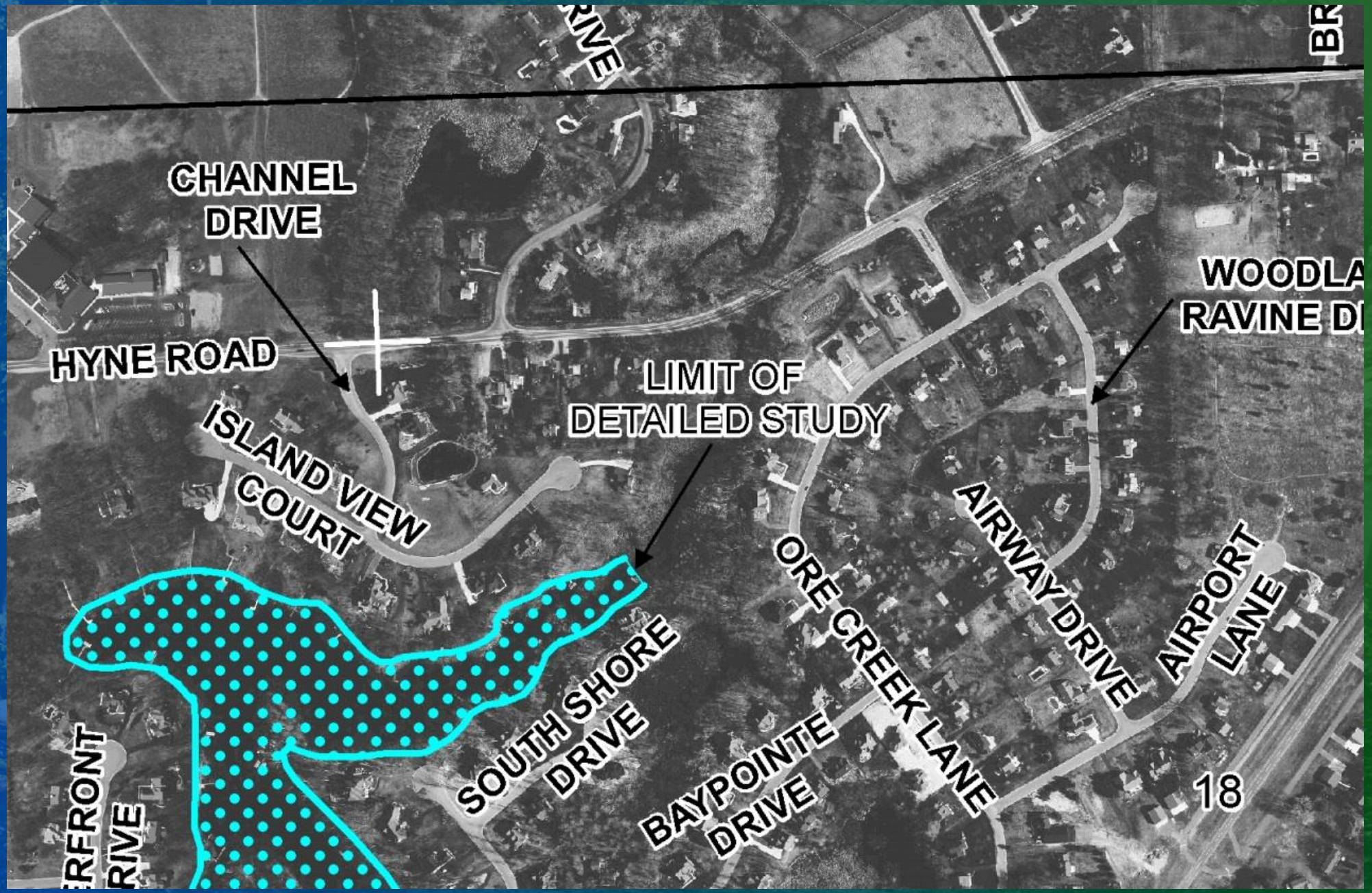
Zone A
Non-studied- elevation unkown

When Looking At A Flood Map

1. The FIRM Shows The Approximate Location of The 100 Year Floodplain (Rounded To The Nearest Food)
2. The Ultimate Determination of Whether or Not A Site Within The 100 Year Floodplain is ELEVATION.

If it is NOT completely obvious it's above the BFE, then require a survey!

Identifying Floodplains in Unmapped Areas


CHANNEL DRIVE
HYNE ROAD
ISLAND VIEW COURT
LIMIT OF DETAILED STUDY
SOUTH SHORE DRIVE
BAYPOINTE DRIVE
ORE CREEK LANE
AIRWAY DRIVE
AIRPORT LANE
18

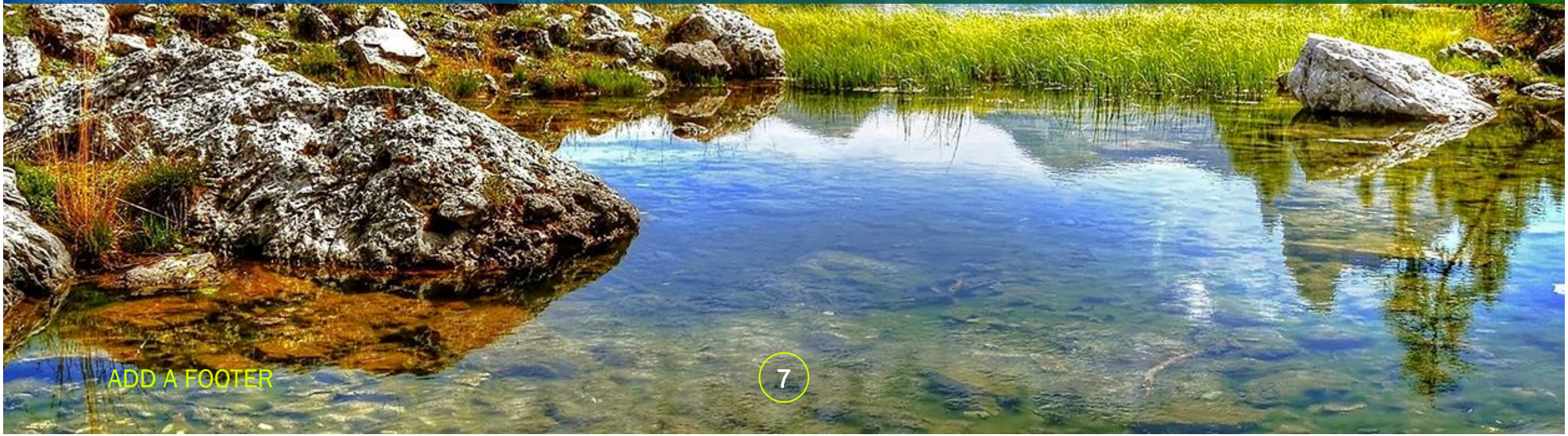
Development Purposes:
DEQ can provide estimates of flood elevations on streams when floodplain maps do not exist.

Requestor submits site location map in Miwaters.

New Construction in a Flood Zone?

2 Choices

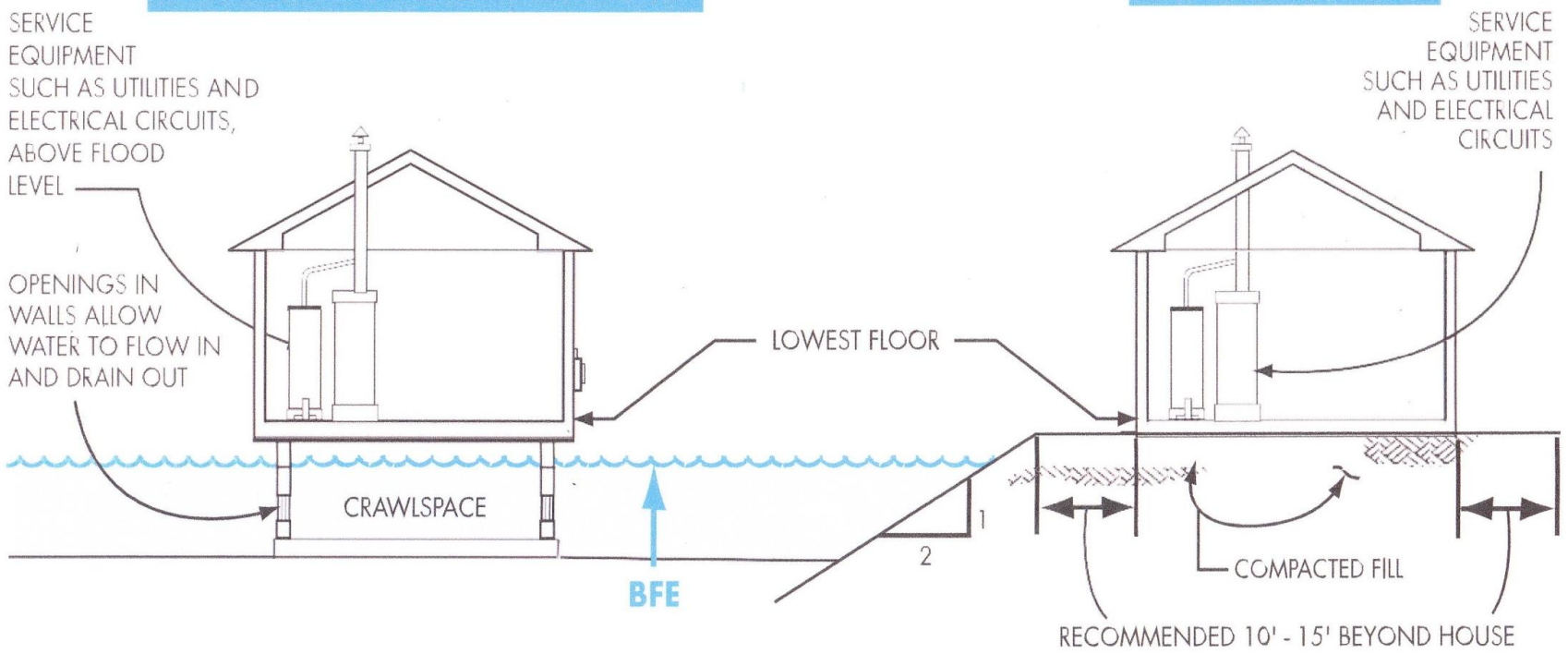
1. Elevation and Build above a Flood Zone
2. Build in a Flood Zone (Compliant)



How to Elevate Your Floodplain Building

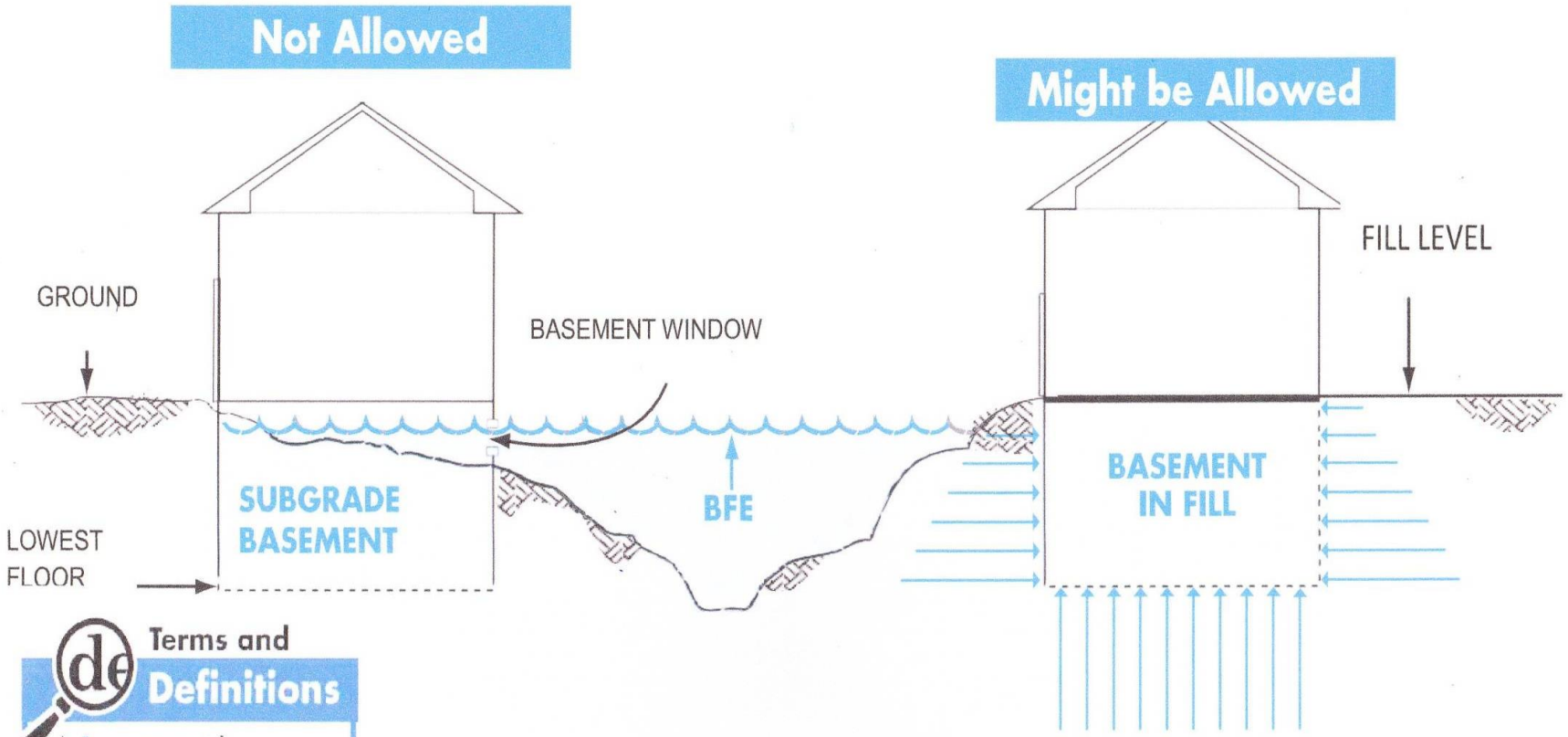
Elevate on Foundation Walls

Elevate on Fill



CAUTION! Enclosures (including crawlspaces) have some special requirements, see page 35. Note: When the walking surface of the lowest floor is at the minimum elevation, under-floor utilities and ductwork are not allowed. Fill used to elevate buildings must be properly compacted (see page 32).

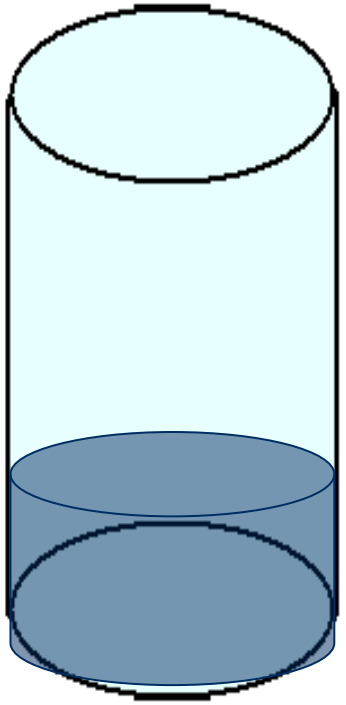
Basements Are Unsafe

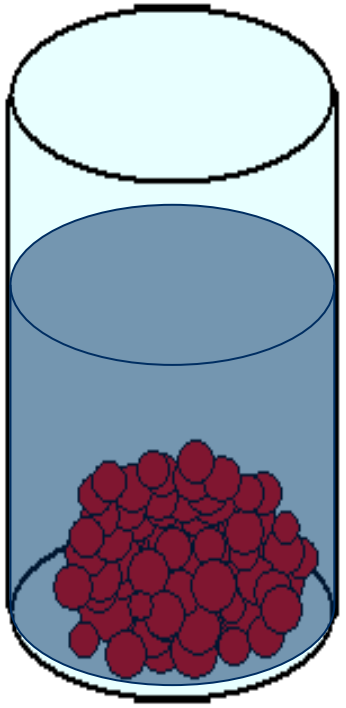


Terms and Definitions

A **basement** is any portion of a building that has its floor sub-grade (below ground level) on all sides.

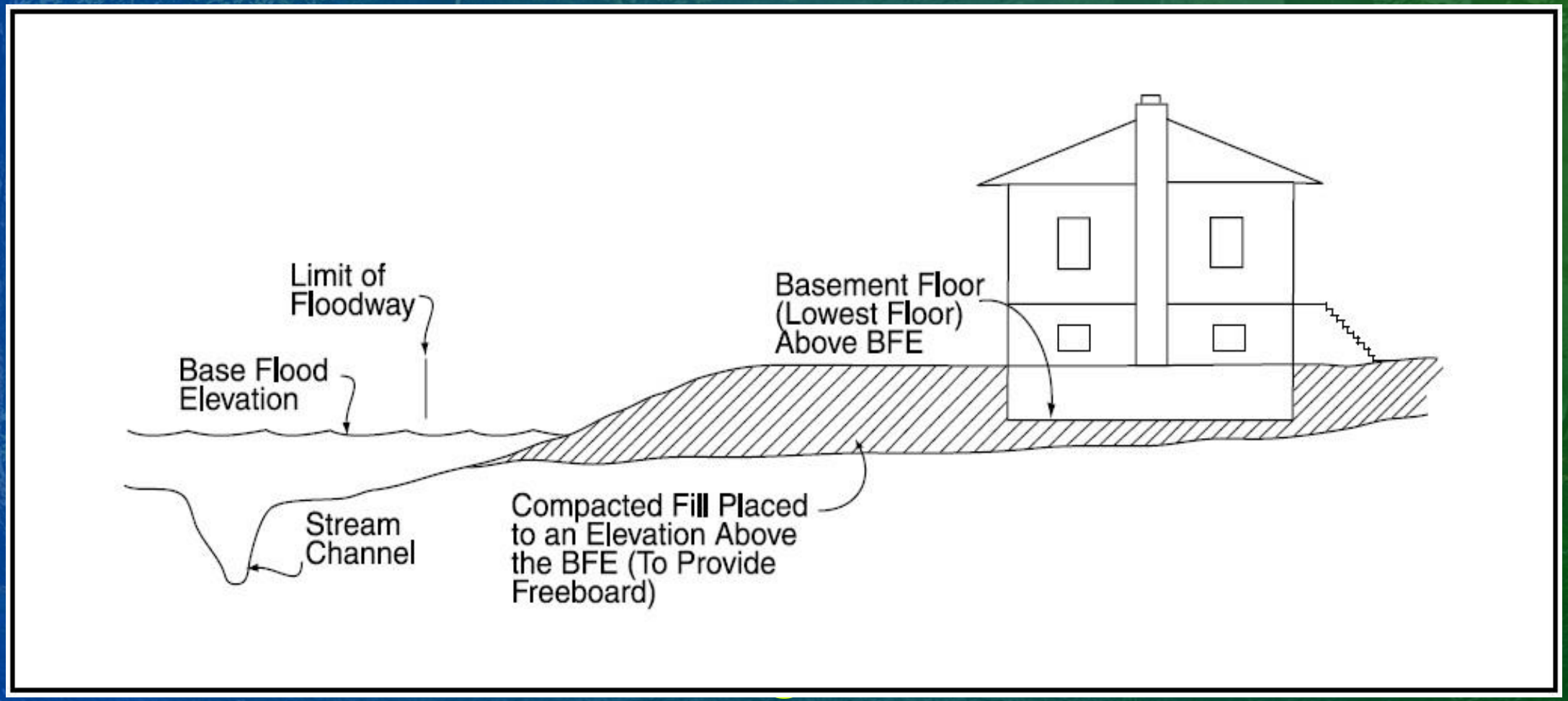
New basements below the BFE are not allowed. An inch of water over the sill and the entire basement can fill. Excavating a basement into fill doesn't always make it safe, pressure from saturated ground can damage the walls. Basements can be designed and built under certain circumstances. Check with your local permit office – the community must certify that a filled site is "reasonably safe from flooding."





300 Cubic Yards/Site Maximum Allowed

Fill - Basement



Great Resource for Community Officials

Technical Bulletin
NO. 10-01

Structures Built on Fill

Elevation Certificate

No longer the Animal it used to be….

When Are They Needed??

When SHOULD an Elevation Certificate be Required

When Building (Any Permitting) Within or Near A Flood Zone Area

1. Pre-Construction
2. Once The Foundation is Complete
3. Prior To Final CFO

Elevation Certificates

MISTAKES
MANY MANY
MISTAKES!!

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

OMB No. 1660-0008
Expiration Date: November 30, 2018

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 Rory Fox		Policy Number:
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 41215 Conger Bay Drive		Company NAIC Number:
City Harrison Township	State Michigan	ZIP Code 48045
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) Part of Lot 47, Lot 48, Belvidere Subdivision as per plat of record. Tax ID #: 17-12-15-154-035		
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) Residential		
A5. Latitude/Longitude: Lat. 42.597920 Long. -82.792798 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 8		
A8. For a building with a crawlspace or enclosure(s): a) Square footage of crawlspace or enclosure(s) 918 sq ft		

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

A7. Building Diagram Number 8

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

a) Square footage of crawlspace or enclosure(s) 918 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 440 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

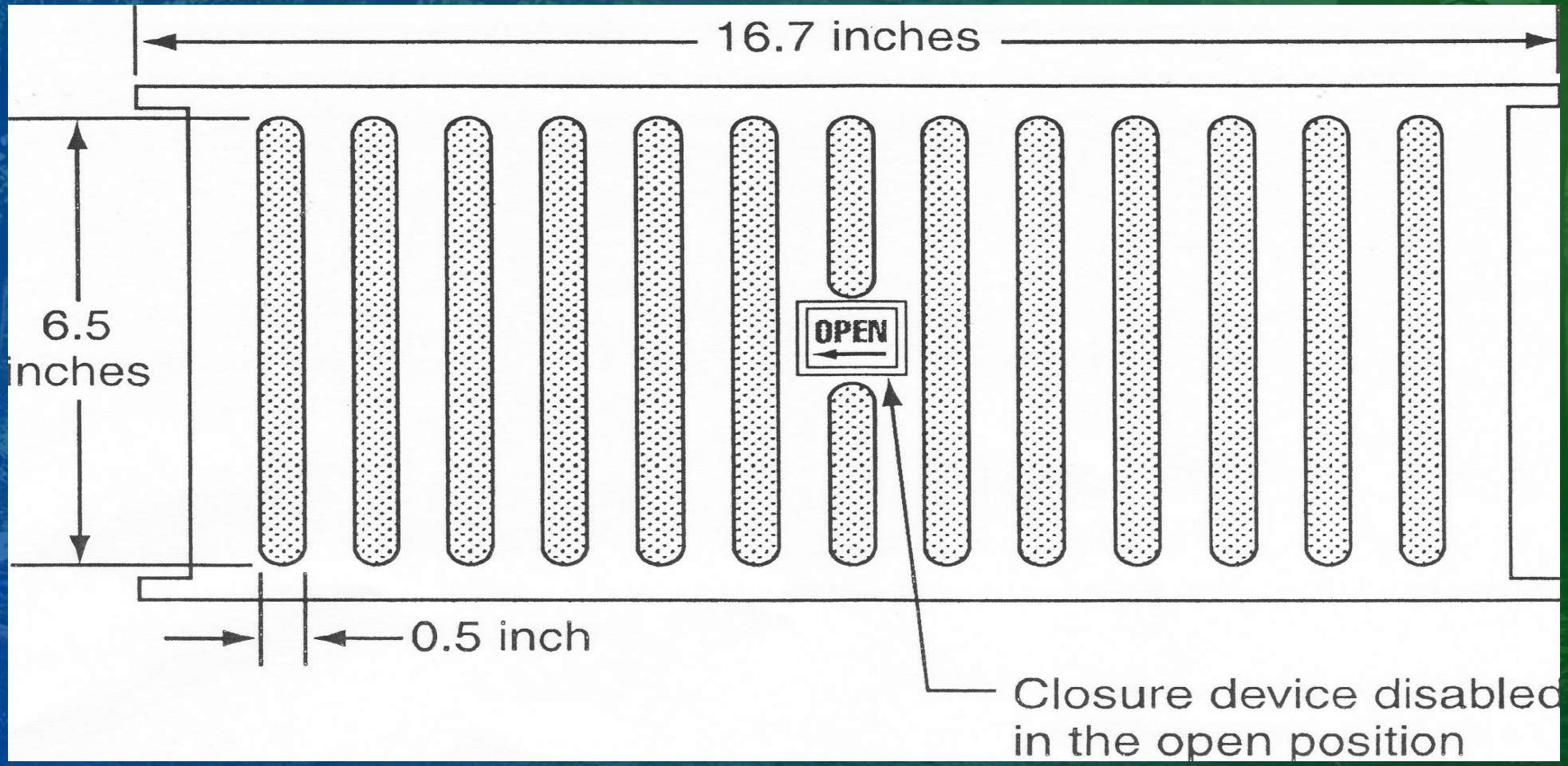
d) Engineered flood openings? ☐ Yes ☒ No

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

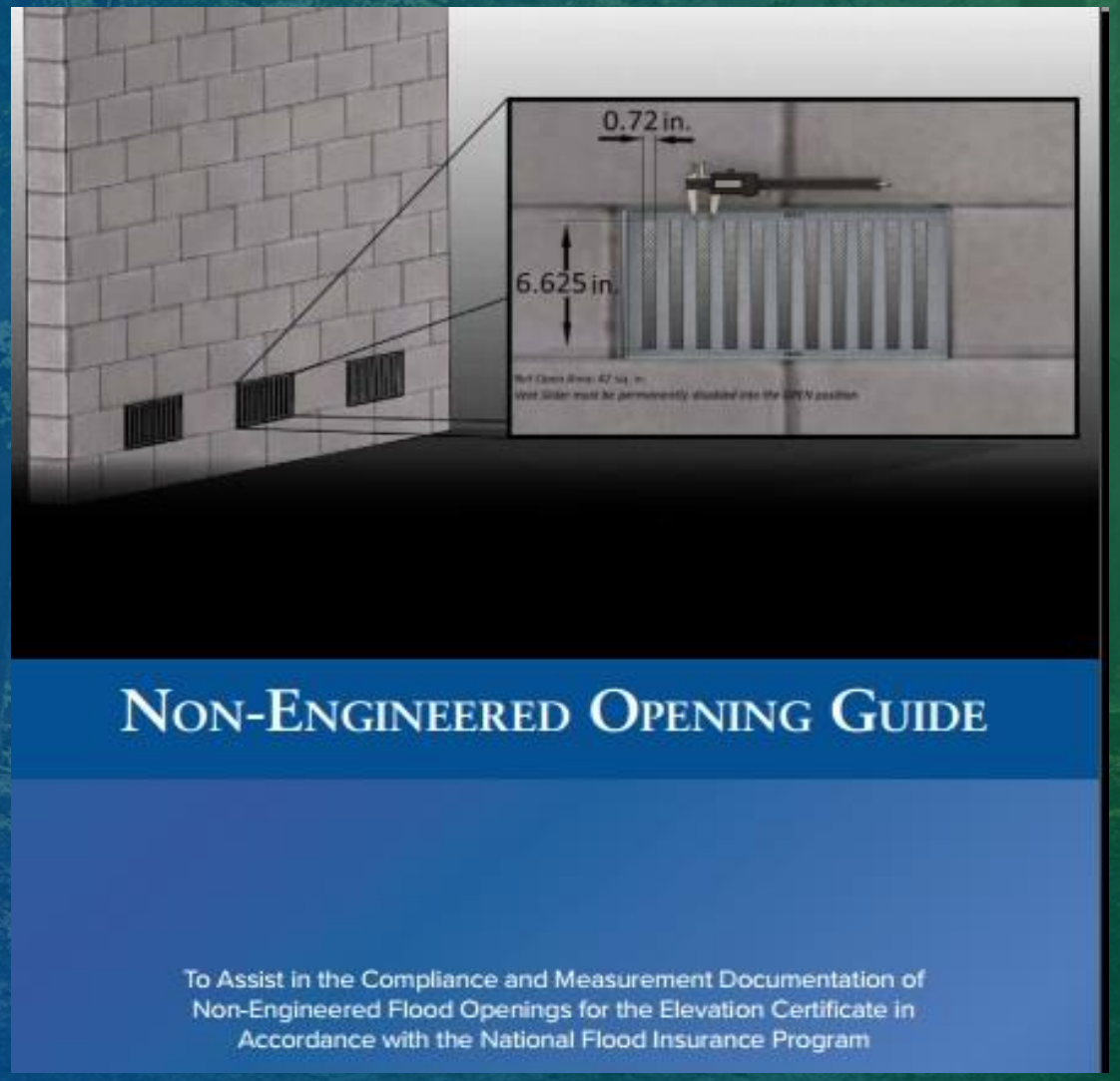
B1. NFIP Community Name & Community Number	B2. County Name	B3. State
Harrison Township #260123	Macomb	Michigan

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)
26099C0356	H	11/20/2013	12/04/2012	AE	578.6'

Standard Vent
42 sq. in.



Vents Vs Engineered Flood Vents



Great Resource for Community Officials

Technical Bulletin
NO.1

Flood Vents / Enclosures

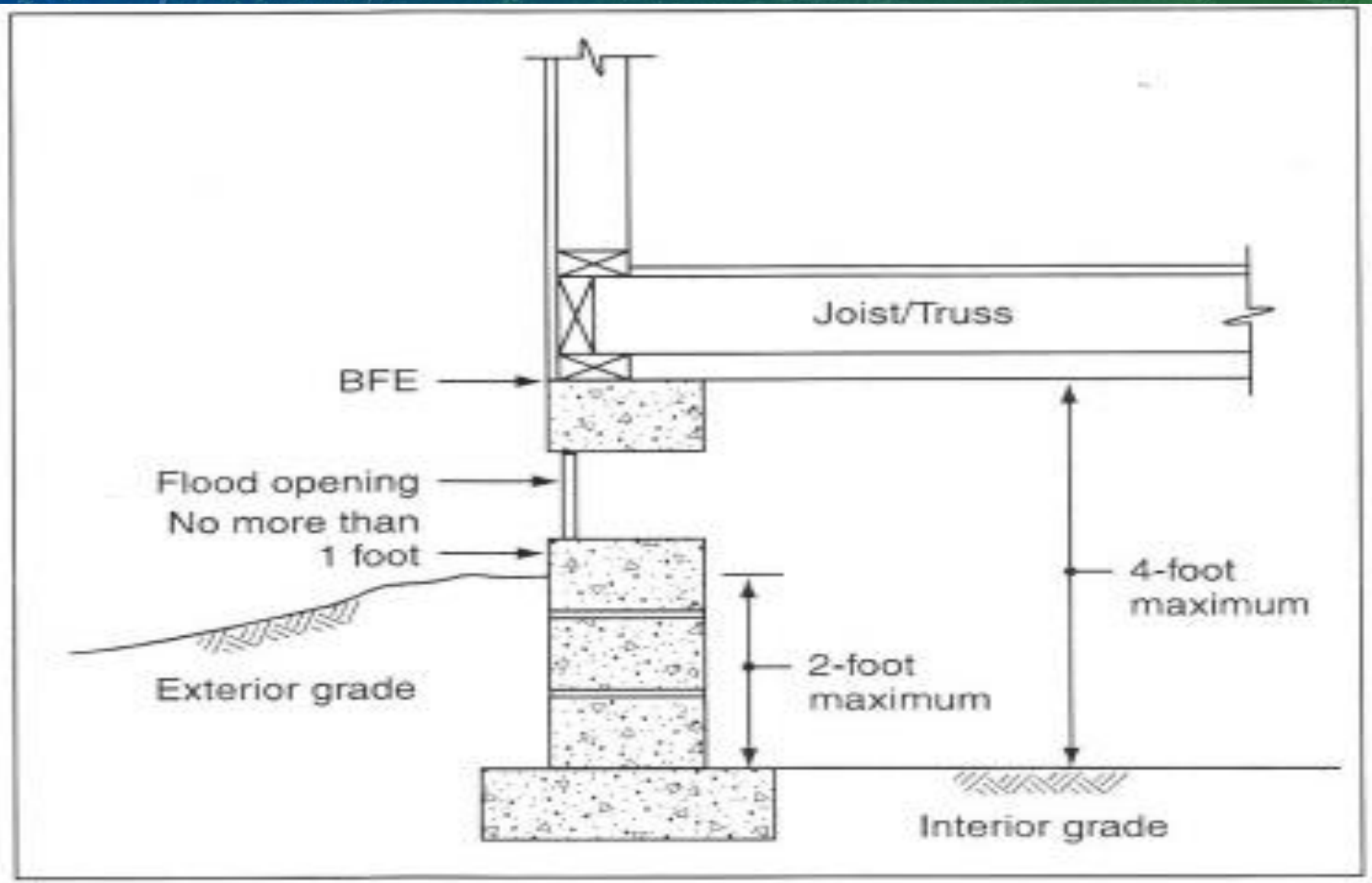


Figure 2. Limitations on below-grade crawlspaces in shallow flood hazard areas (TB 11)

Mistakes on Elevation Certificates

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State
Harrison Township #260123	Macomb	Michigan

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)
26099C0356	H	11/20/2013	12/04/2012	AE	578.6'

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: FIS Stillwater Chart

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

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

Designation Date: _____ ☐ CBRS ☐ OPA

FEMA Form 086-0-33 (7/15) Replaces all previous editions. Form Page 1 of 6

Can a Homeowner Complete An Elevation Certificate?

YES or NO???

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.

Elevation Certificates in a Zone A

What is an Acceptable BFE?

- Letter from DEQ?
- Nearby LOMA?
- Platted Subdivision?
- Letter from Community Official?

What if We Cannot Eliminate The Flood Insurance Requirement

If Done Correctly, In Most Cases We Can Get A 75% Reduction In Your Flood Insurance Premium.
Guaranteed!!

ELEVATION CERTIFICATE

BW-12

BW-12

- Eliminating Subsidized Rates….most of which are pre-FIRM structures (EC necessary to calculate full risk rates)
- Eliminating all Grandfathering - beginning Oct. 2014 (increase in premiums 25% per year)
- Increases all fines to lenders who neglect to force flood insurance.
- Requires Elevation Certificates on all new flood policies written. (post-dates back to July of 2012)

Insurance Agents

- Writing a Flood Insurance Policy
- Homeowners have options
- Reading the Elevation Certificate
- Lowest Floor vs Lowest Adjacent Grade
- Conditions for installing Flood Vents

Elevation Certificate

No Longer The Animal it Used
To Be……
When Are They Needed???

Let's Talk Non-Compliant vs Compliant

How Do We Make A Structure Compliant?

- Flood Vents
- Elevating Mechanicals
- Adjusting Elevations

Standard Vent 42 sq. in.

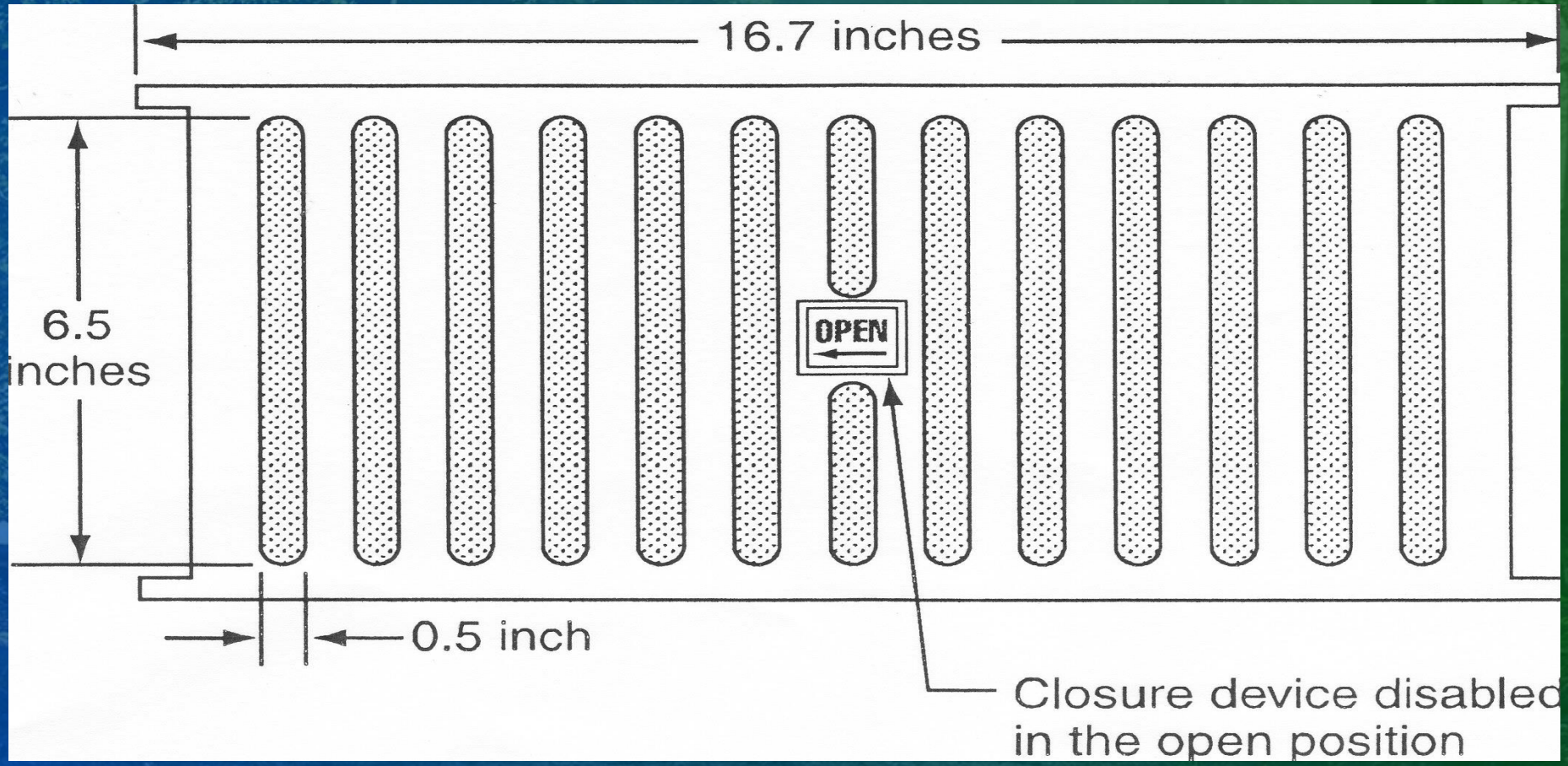
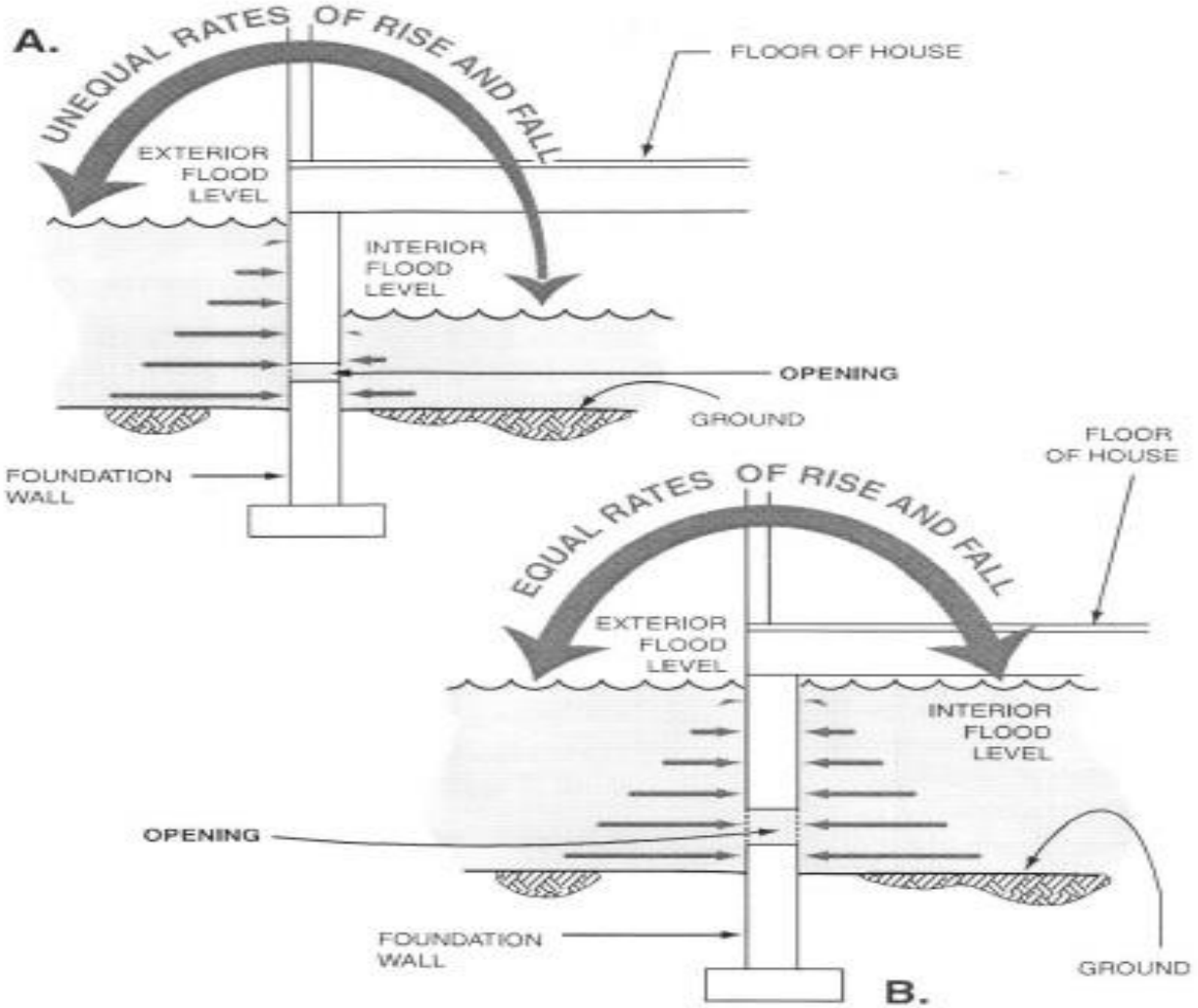


Figure 6-2
Wall openings must allow flood waters not only to enter the house but also to rise and fall at the same rate as flood waters outside.



When the number and/or size of openings in foundation walls are inadequate (A), interior flood levels cannot rise or fall as fast as exterior flood levels. As a result, hydrostatic pressures, as indicated by the horizontal arrows, are not equalized. When the number and size of openings are adequate (B), interior and exterior flood levels rise and fall at the same rate and hydrostatic pressures are equalized.

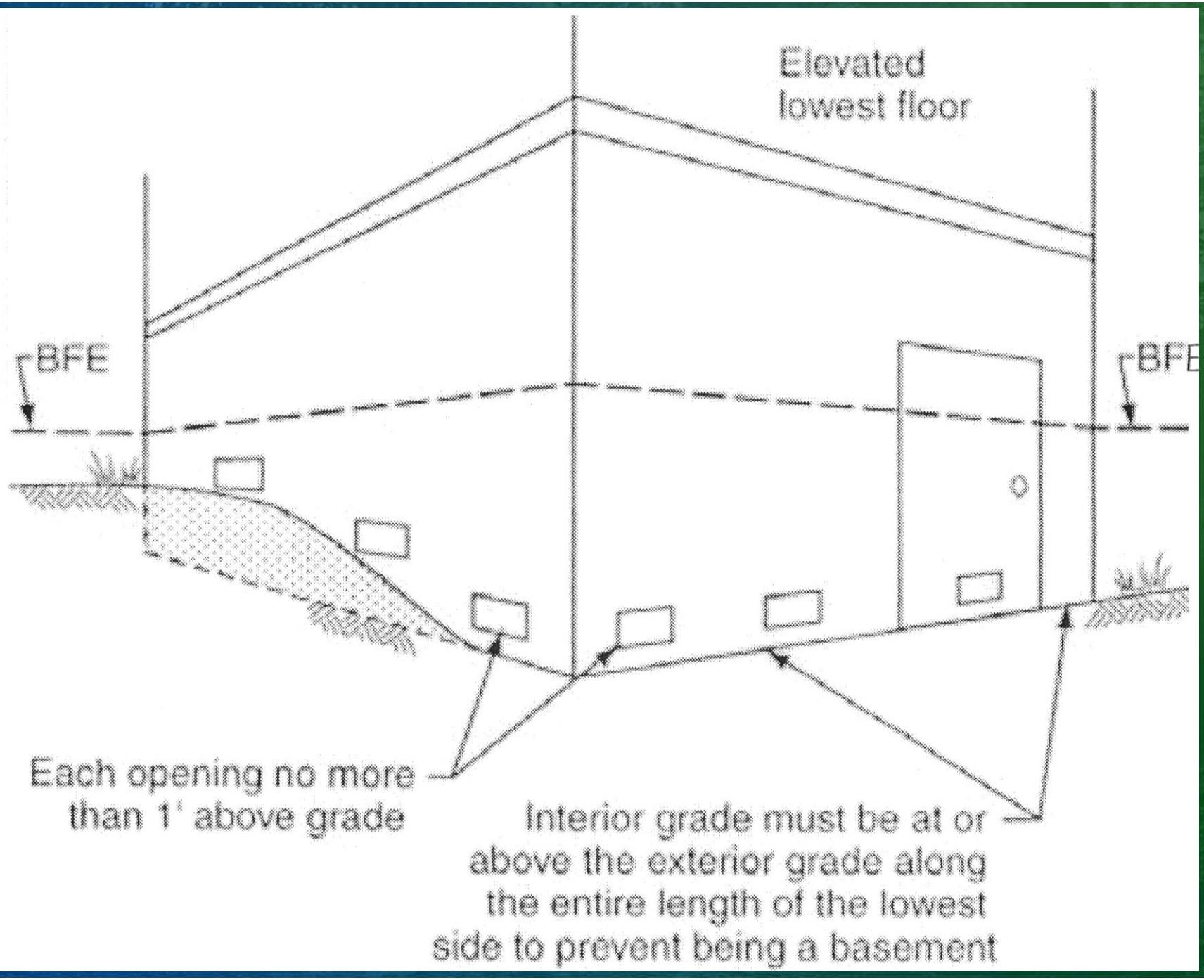
Engineered Flood Vents


MIP
most innovative product
AT WORLD OF CONCRETE

Engineered Flood Vents

Placement of Vents?

Number of Vents?


Elevated
lowest floor
BFE
BFE
Each opening no more
than 1' above grade
Interior grade must be at or
above the exterior grade along
the entire length of the lowest
side to prevent being a basement

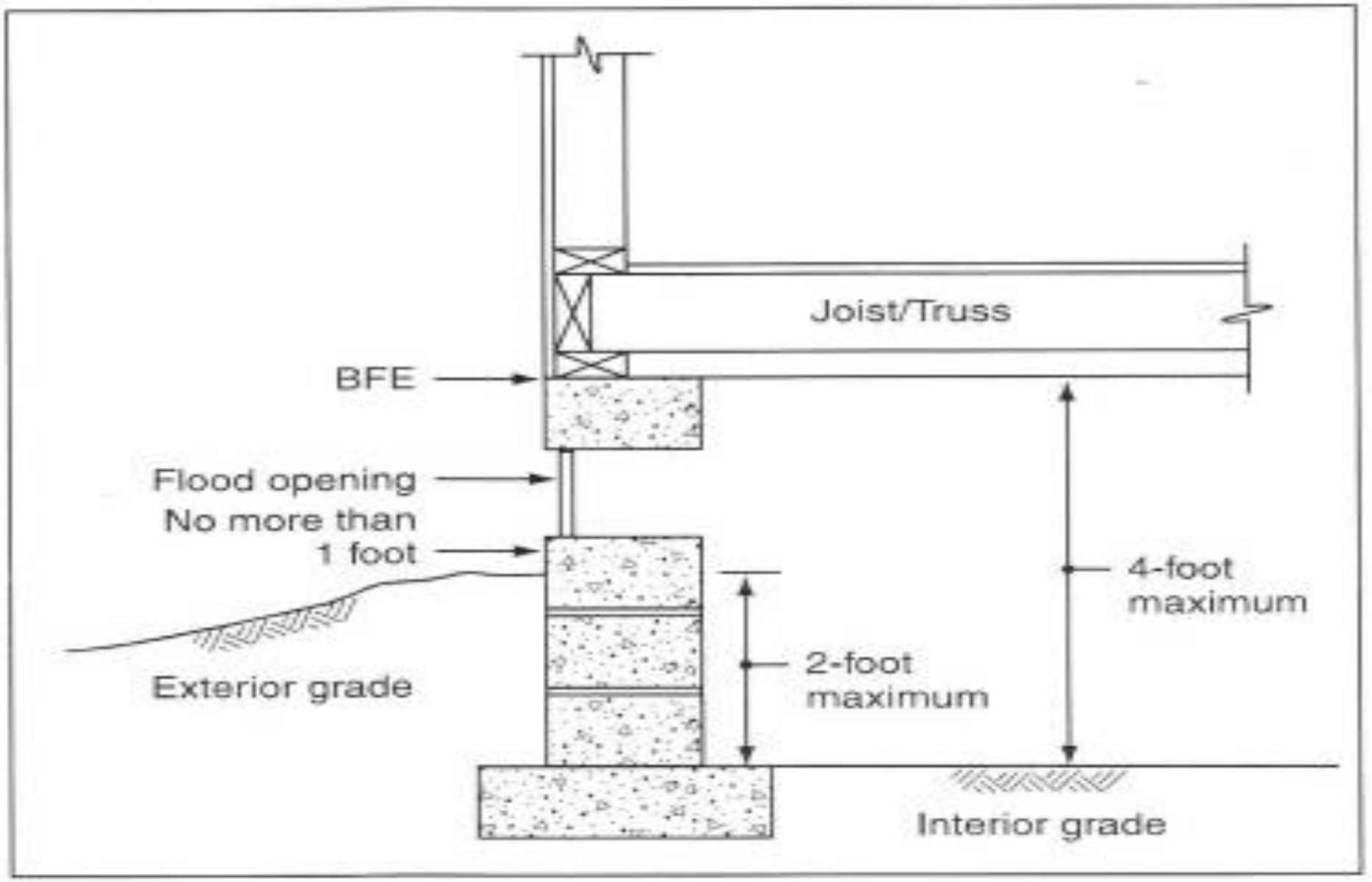


Figure 2. Limitations on below-grade crawlspaces in shallow flood hazard areas (TB 11)

Elevating All Mechanicals Servicing The Structure!

Air Conditioning Units
Sump Pumps are fine

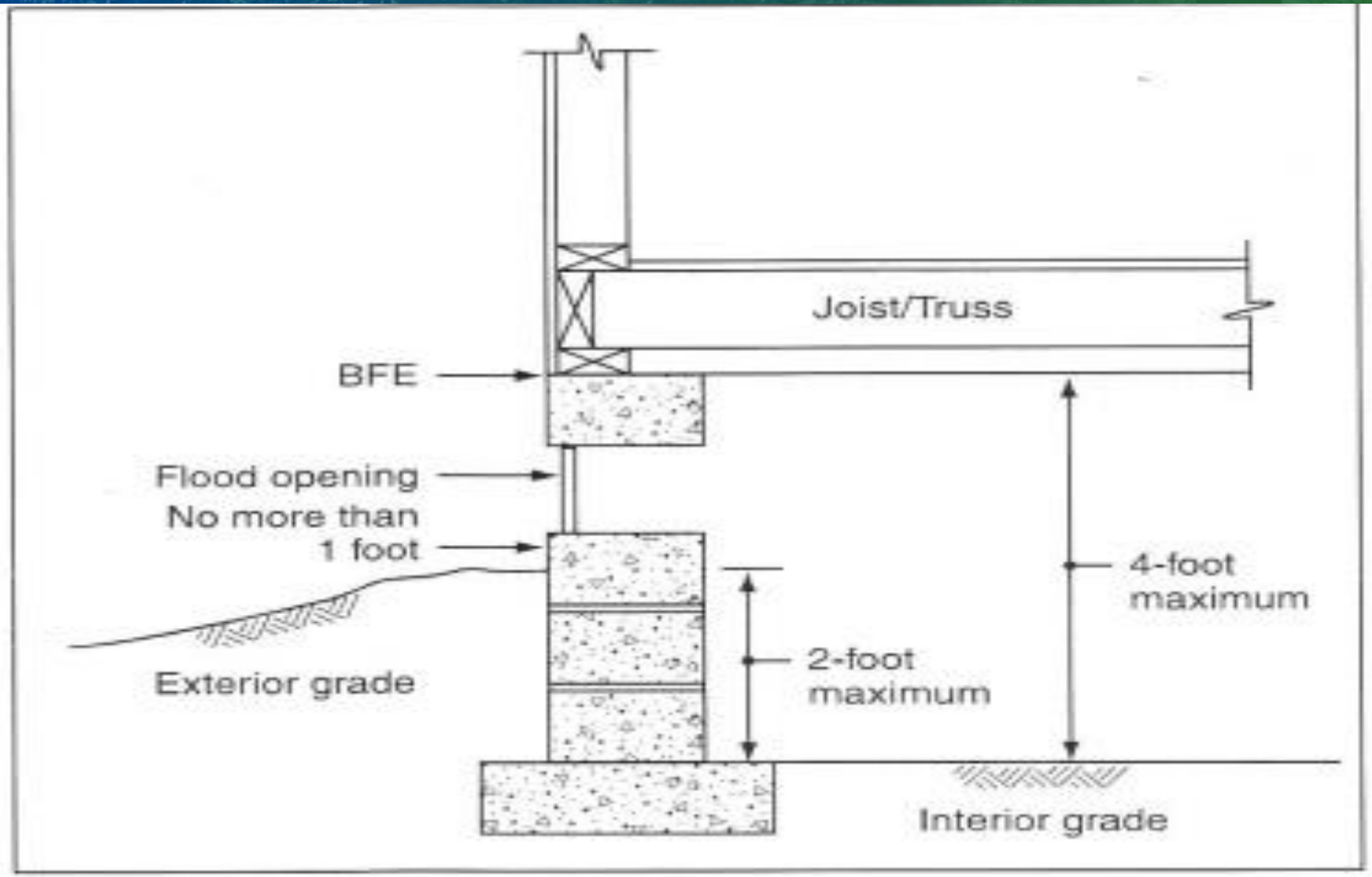


Figure 2. Limitations on below-grade crawlspaces in shallow flood hazard areas (TB 11)

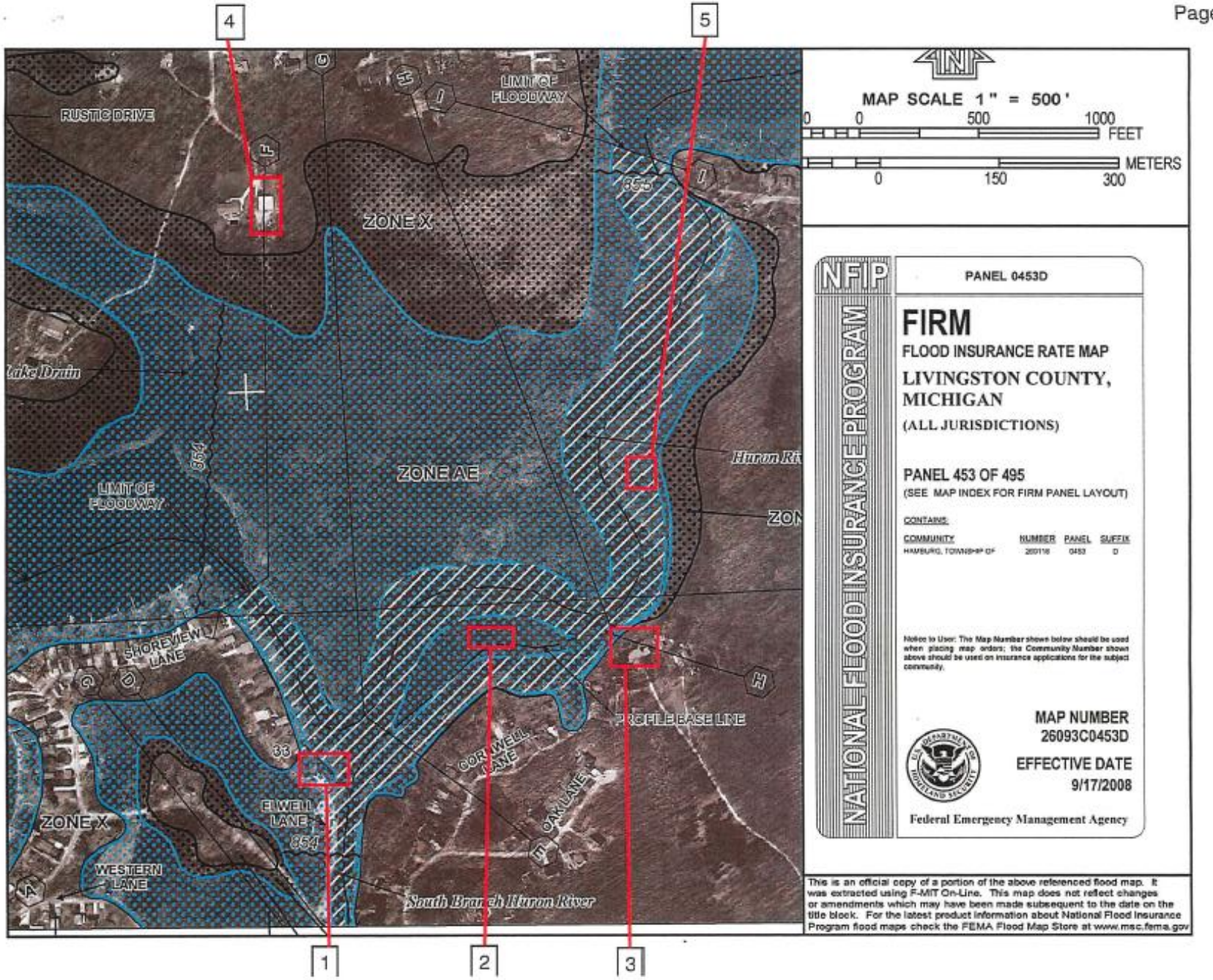
New Construction

ZONE A

Vacant Land

If it's Location Completely Within a 1% Floodplain Area....
Is it Buildable??


Flood Zones
Review Hand-outs



MAP SCALE 1 " = 500 '

0 0 500 1000 FEET

0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0453D

FIRM

FLOOD INSURANCE RATE MAP

LIVINGSTON COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 453 OF 495

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HAMBURG, TOWNSHIP OF	260116	0453	D

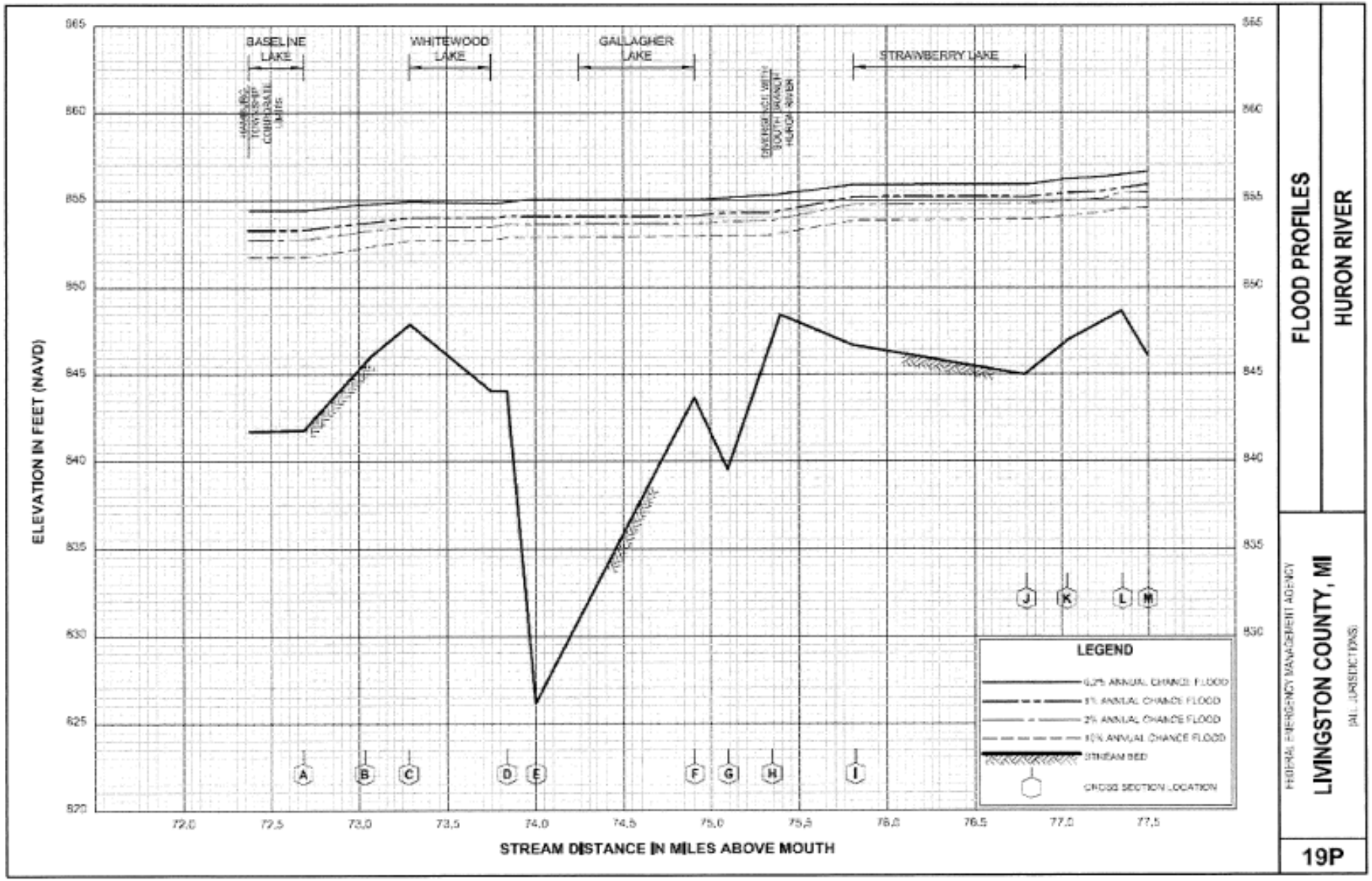
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

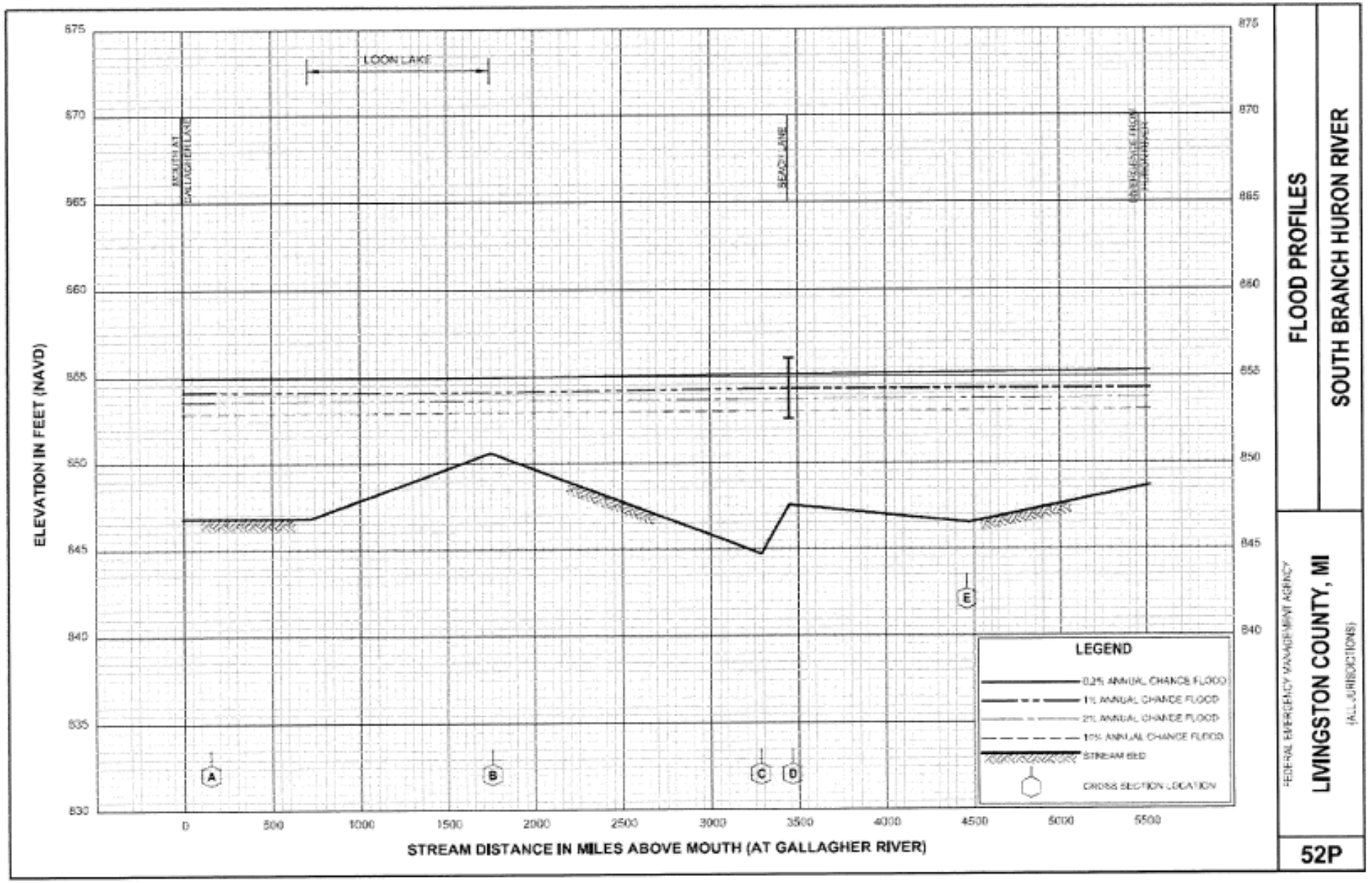
MAP NUMBER
26093C0453D

EFFECTIVE DATE
9/17/2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


BASELINE LAKE
WHITEWOOD LAKE
GALLAGHER LAKE
STRAWBERRY LAKE
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN MILES ABOVE MOUTH
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
HURON RIVER
FEDERAL EMERGENCY MANAGEMENT AGENCY
LIVINGSTON COUNTY, MI
19P


FLOOD PROFILES
SOUTH BRANCH HURON RIVER
FEDERAL EMERGENCY MANAGEMENT AGENCY
LIVINGSTON COUNTY, MI
(ALL JURISDICTIONS)
52P
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN MILES ABOVE MOUTH (AT GALLAGHER RIVER)
LOON LAKE
MOUTH AT GALLAGHER LAKE
BEACH LANE
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
875
870
865
860
855
850
845
840
835
830
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	72.679	396	1,218	2.0	853.3	853.3	853.3	0.0
B	73.028	850	2,363	1.0	853.7	853.7	853.8	0.1
C	73.278	850	1,565	1.5	854.0	854.0	854.1	0.1
D	73.834	900	2,372	1.0	854.1	854.1	854.2	0.1
E	73.999	310	4,943	0.5	854.1	854.1	854.2	0.1
F	74.905	131	991	2.1	854.1	854.1	854.2	0.1
G	75.096	451[2]	2,239	1.0	854.3	854.3	854.4	0.1
H	75.342	180	690	3.3	854.3	854.3	854.4	0.1
I	75.814	224	1,231	1.9	855.2	855.2	855.3	0.1
J	76.798	520	1,781	1.2	855.2	855.2	855.3	0.1
K	77.030	900	3,181	0.7	855.4	855.4	855.5	0.1
L	77.353	550	1,896	1.0	855.7	855.7	855.8	0.1
M	77.499	192	873	2.2	855.9	855.9	856.0	0.1
N	77.567	64	454	4.3	855.9	855.9	856.0	0.1
O	77.603	118	751	2.6	856.2	856.2	856.3	0.1
P	77.717	446	1,668	1.2	856.4	856.4	856.5	0.1
Q	77.899	228	1,086	1.8	856.6	856.6	856.7	0.1
R	78.000	84	545	3.6	856.7	856.7	856.8	0.1
S	78.045	295	994	2.0	856.9	856.9	857.0	0.1
T	78.283	350	1,258	1.5	857.2	857.2	857.3	0.1
U	78.522	435	1,552	1.3	857.6	857.6	857.7	0.1
V	78.819	290	924	2.1	857.9	857.9	858.0	0.1
W	79.018	291	1,407	1.4	858.2	858.2	858.3	0.1
X	79.369	355	1,414	1.4	858.4	858.4	858.5	0.1
Y	79.600	360	1,551	1.3	858.6	858.6	858.7	0.1
Z	79.862	122	651	3.0	858.7	858.7	858.8	0.1

[1]Miles above mouth

[2]Combined width with South Branch Huron River

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

LIVINGSTON COUNTY, MI
(ALL JURISDICTIONS)

FLOODWAY DATA

HURON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	150	133	788	0.3	854.1	854.1	854.2	0.1
B	1,750	52	123	1.6	854.1	854.1	854.2	0.1
C	3,280	61	403	0.5	854.3	854.3	854.4	0.1
D	3,460	40	208	1.0	854.3	854.3	854.4	0.1
E	4,460	451[2]	212	0.4	854.3	854.3	854.4	0.1

[1]Feet above mouth (at Gallagher Lake)
[2]Combined width with Huron River

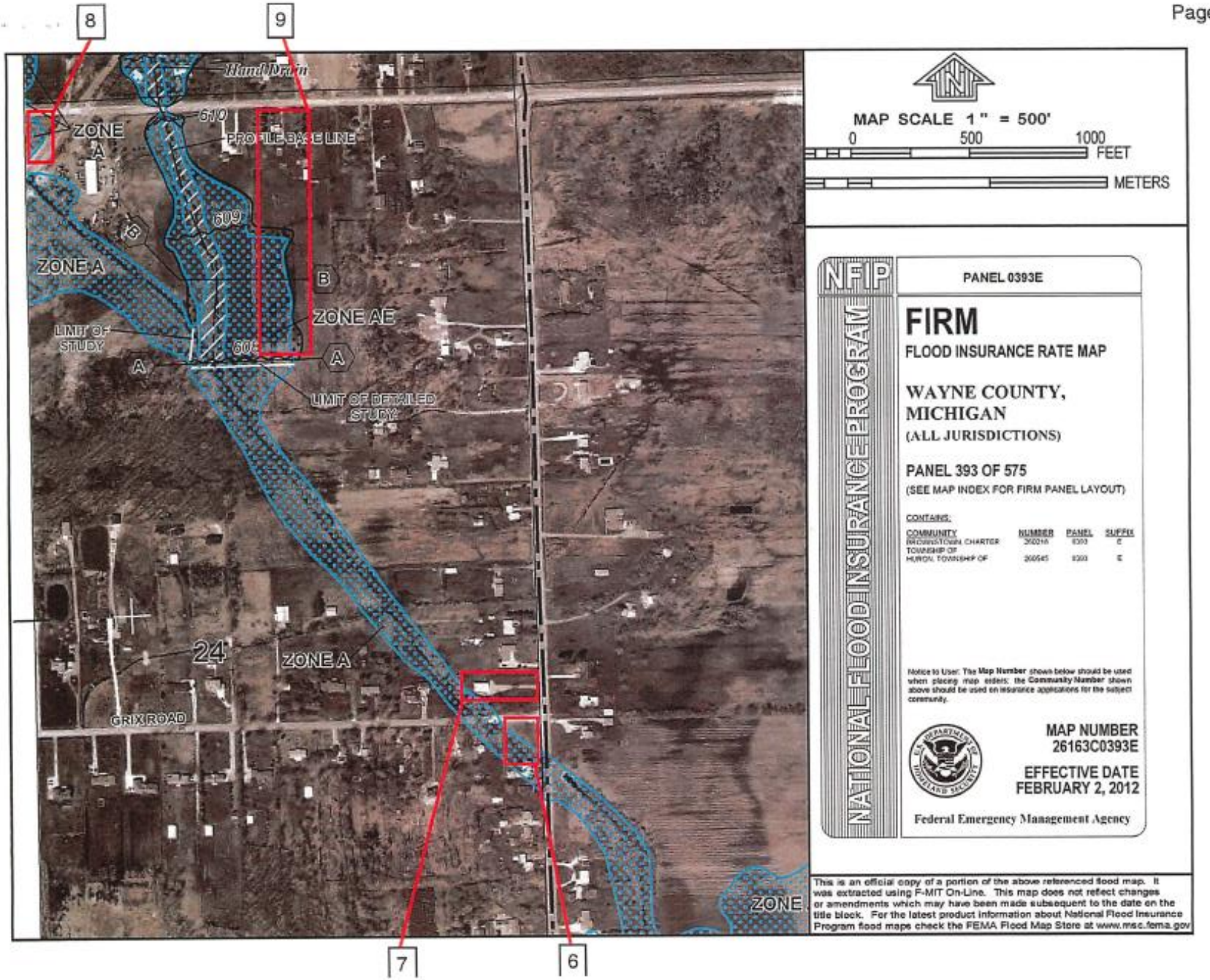
TABLE 14

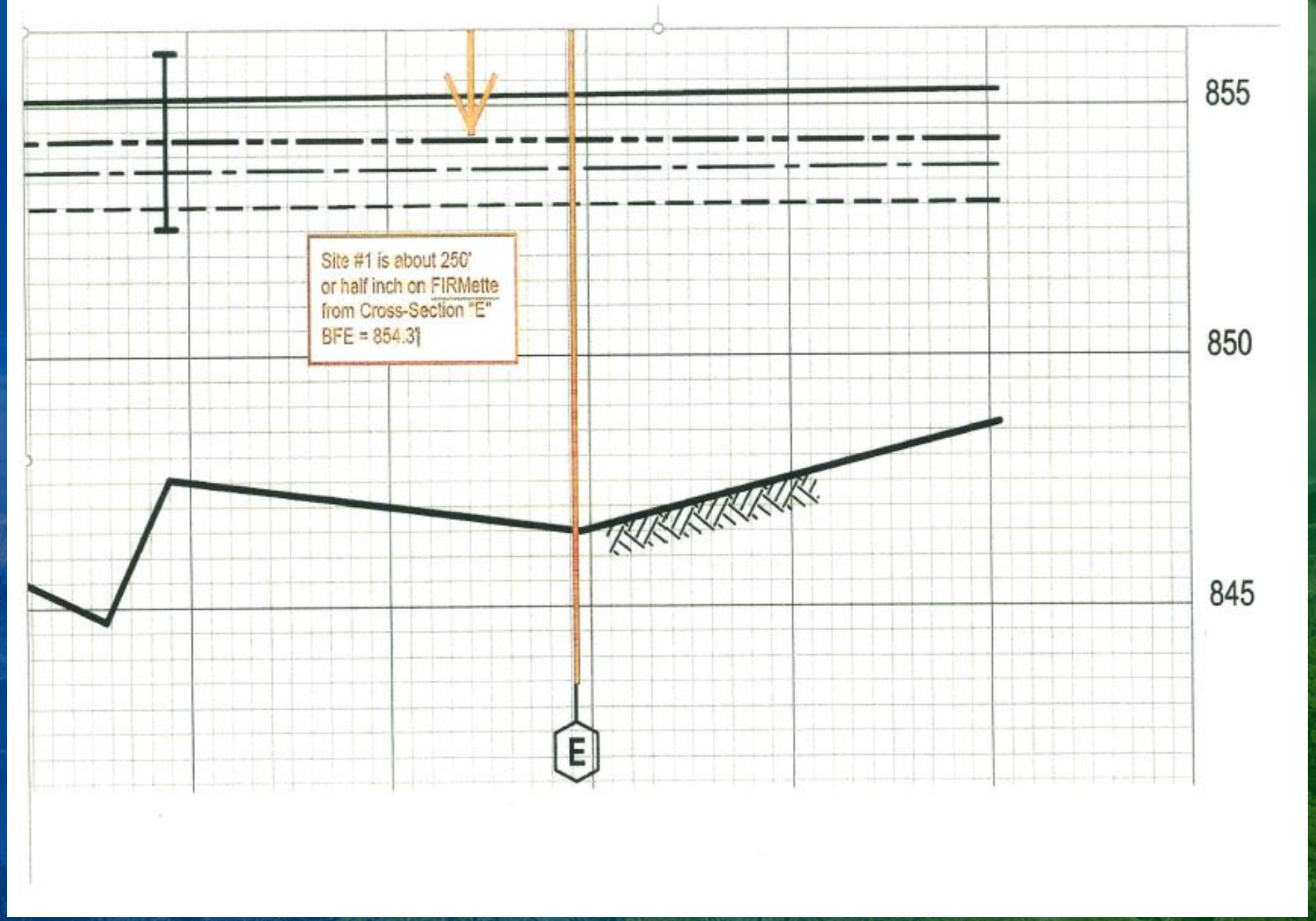
FEDERAL EMERGENCY MANAGEMENT AGENCY

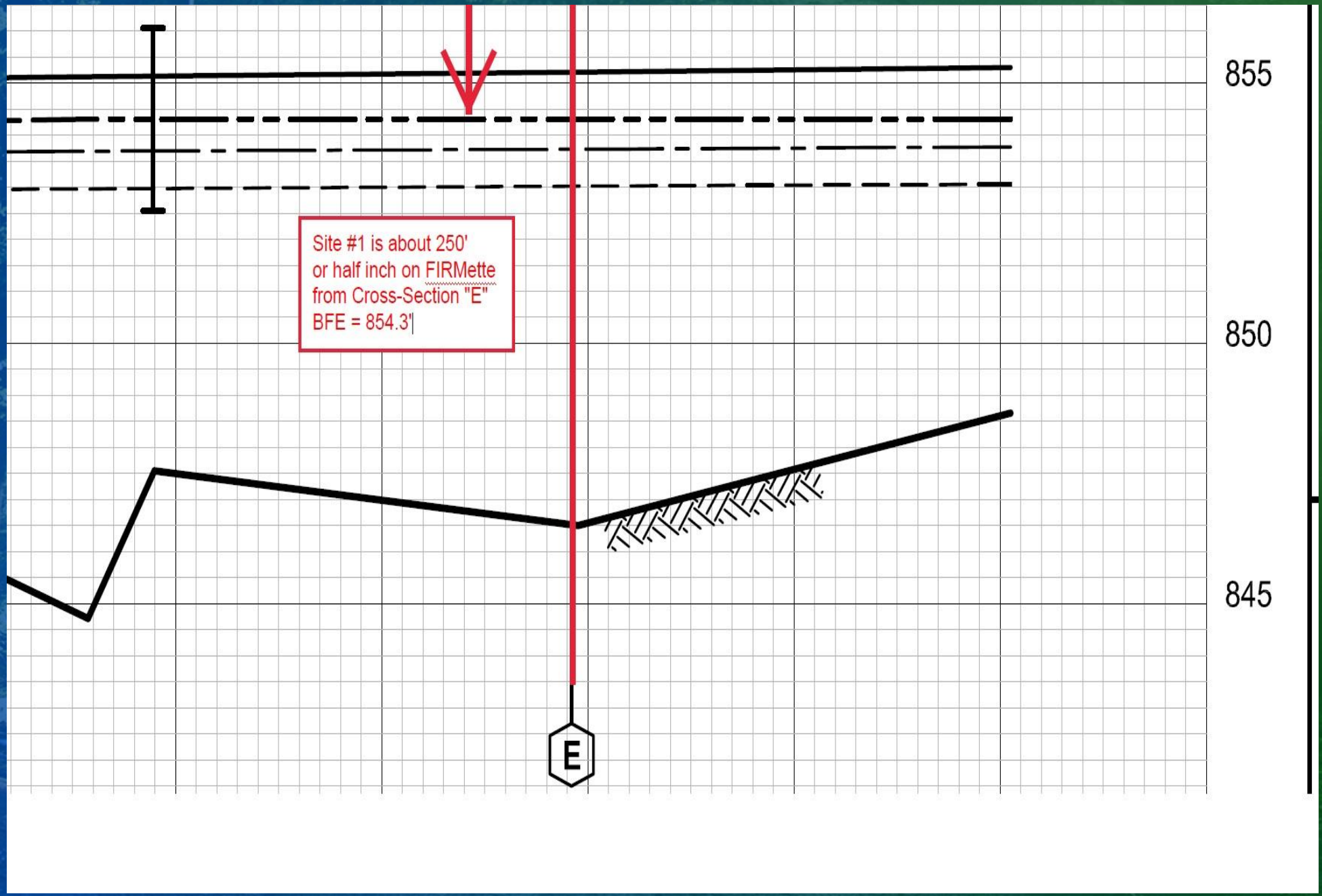
LIVINGSTON COUNTY, MI
(ALL JURISDICTIONS)

FLOODWAY DATA

SOUTH BRANCH HURON RIVER


8
9
Hand Drain
610
ZONE A
PROFILE BASE LINE
609
ZONE A
B
ZONE AE
LIMIT OF STUDY
608
A
A
LIMIT OF DETAILED STUDY
24
ZONE A
GRIX ROAD
ZONE
7
6
MAP SCALE 1 " = 500'
0
500
1000
FEET
METERS
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0393E
FIRM
FLOOD INSURANCE RATE MAP
WAYNE COUNTY, MICHIGAN
(ALL JURISDICTIONS)
PANEL 393 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
BROWNSTOWN, CHARTER TOWNSHIP OF
260216
0393
E
HURON, TOWNSHIP OF
260545
0393
E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
26163C0393E
EFFECTIVE DATE
FEBRUARY 2, 2012
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


855
850
845
Site #1 is about 250'
or half inch on FIRMette
from Cross-Section "E"
BFE = 854.3
E


Site #1 is about 250'
or half inch on FIRMette
from Cross-Section "E"
BFE = 854.3'
855
850
845
E

Our Role As Professionals in the 21st Century

- Flood Zones
- Educating
- Safer Community

Questions??