PDHonline Course L129 (5 PDH)

FEMAs Flood Maps (FIRM) - Understanding and Utilizing This Resource

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2012

PDH Online | PDH Center

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Welcome to:

The FEMA FIRM Tutorial

Screen-captures of FEMA's well-thought-out and carefully presented tutorial on:

Flood Insurance Rate Maps

Table of Contents

Note:

The sequence that FEMA's tutorial follows when the user clicks the forward (right) arrow when progressing through the "FLOOD MAP OVERVIEW" section differs from the order presented using the tutorial's "Contents" pull-down listing located at the upper right on the web site's slides.

This hard-copy version follows the order the tutorial takes when clicking the forward (right) arrow while viewing the tutorial on FEMA's site, NOT the order using the tutorial's Contents pull-down.

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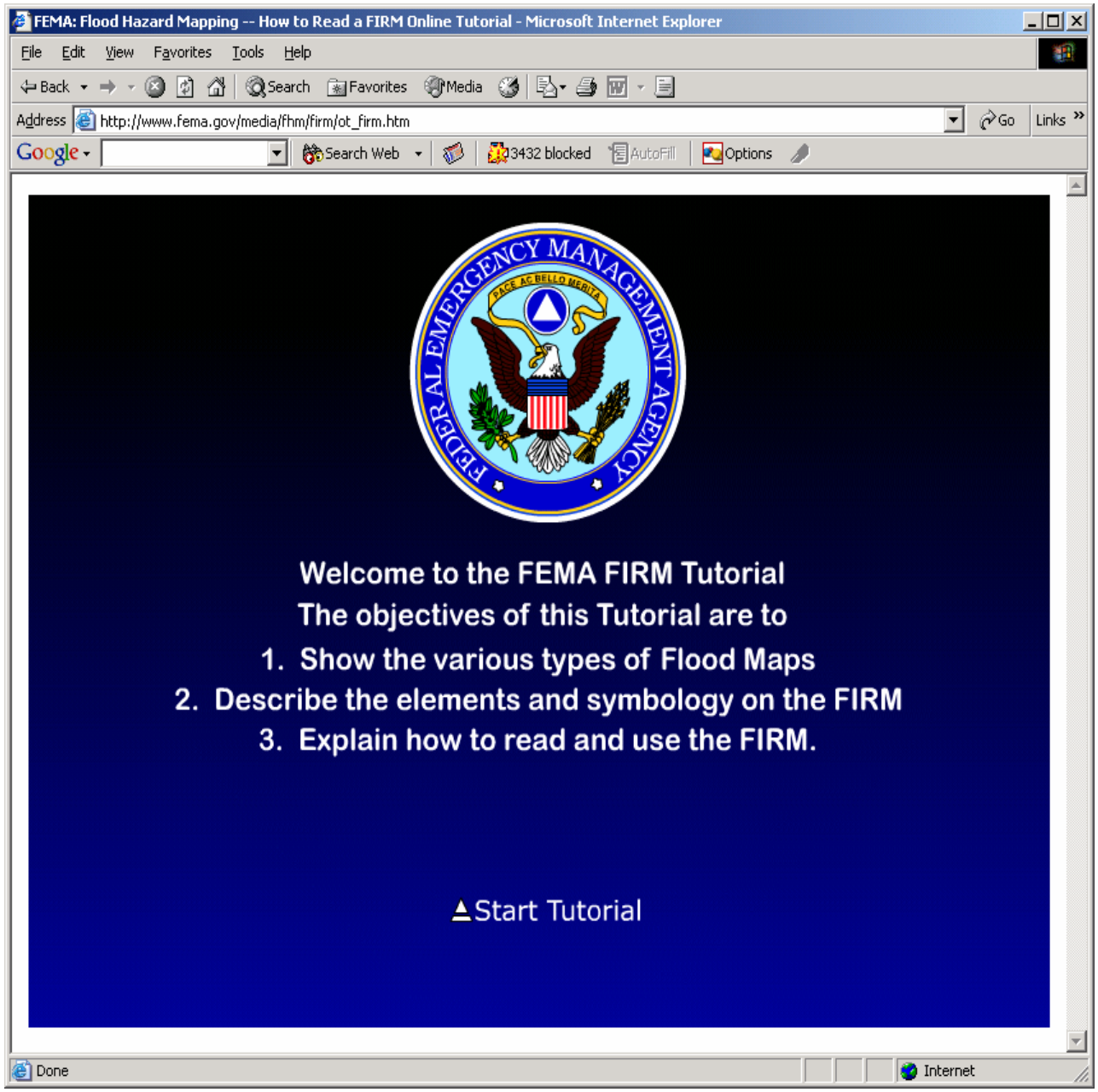
Table of Contents (continued)



This course's study material is also available on FEMA's site: http://www.fema.gov/media/fhm/firm/ot_firm.htm

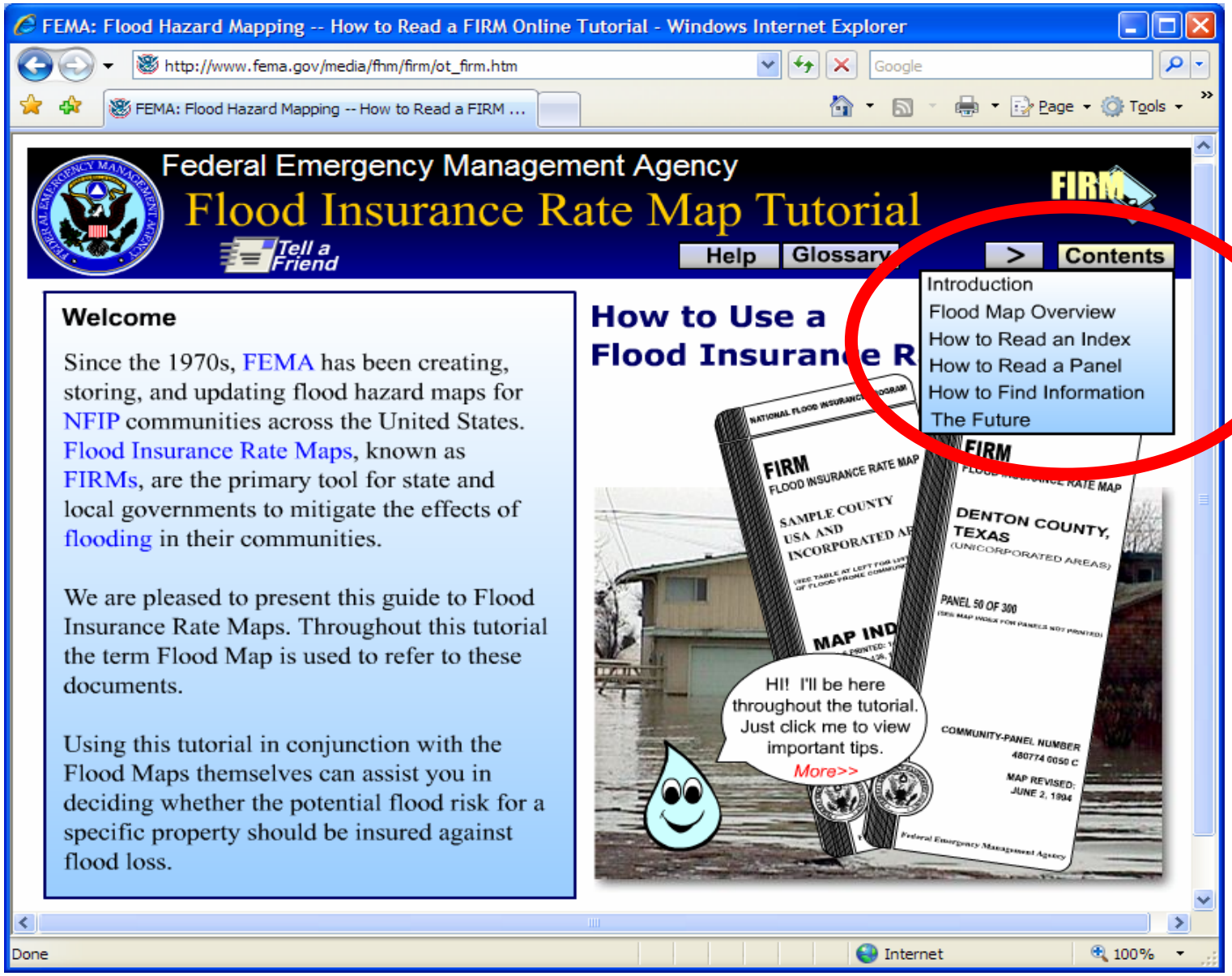
Most of the animations on the site are, in this author's opinion, adequately represented on the following pages, with the added benefit of making review more convenient. Studying the course in this format, makes it easy to find material many pages back or forward – something you may consider more convenient than numerous back and forward commands using your browser.

The test supplied with this tutorial is necessary to obtain P.D.H. continuing education credit through PDH Online. The sequence of the questions in the quiz closely follows the sequence of the course presentation.

Even as a person who's utilized FEMA/FIRM maps for years, I found going through the course material more than beneficial. Here's hoping you will, too!

Jonathan Terry, P.L.S.

Clicking on the Contents box in the "live" tutorial on FEMA's site opens the drop-down box and looks like the slide below"

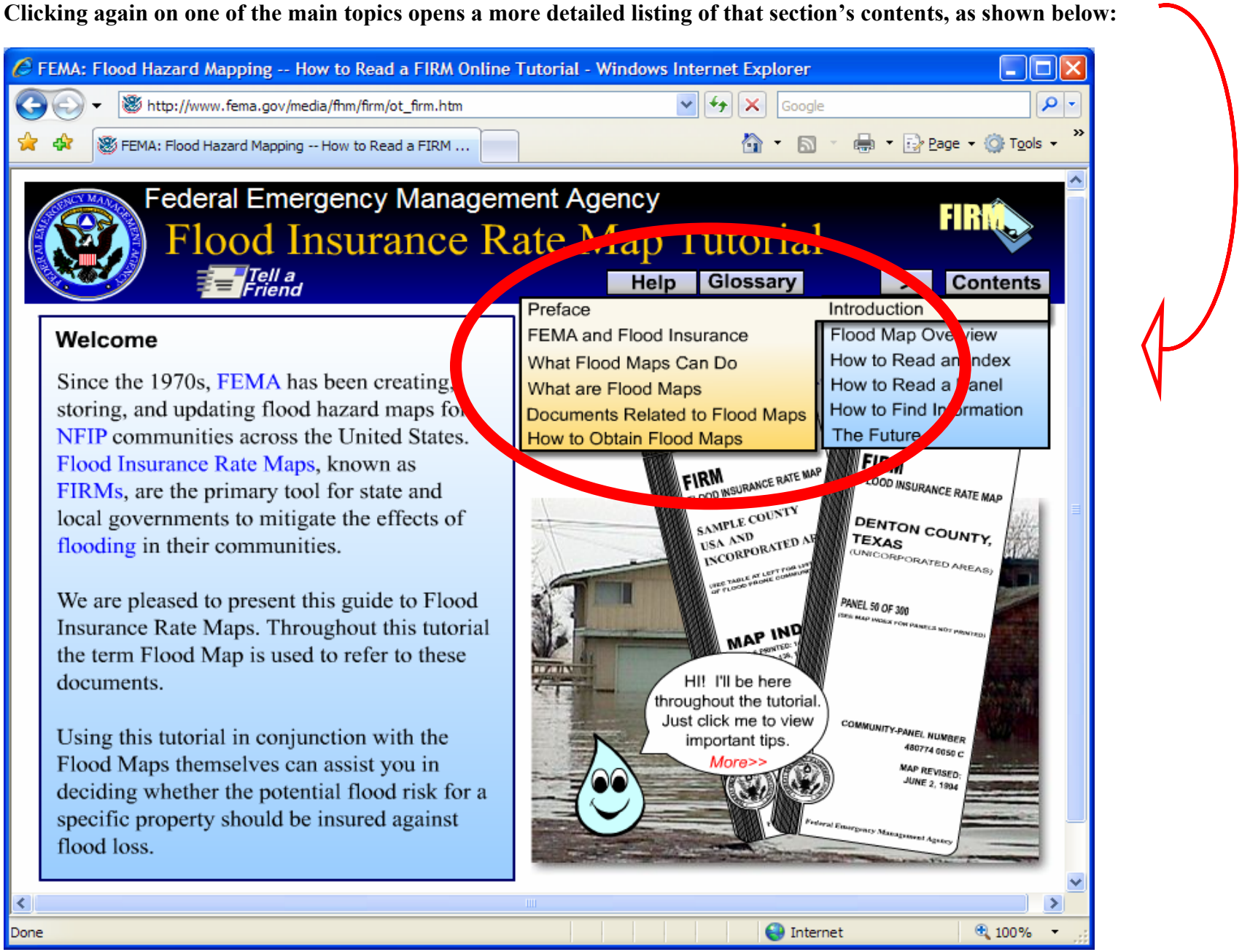


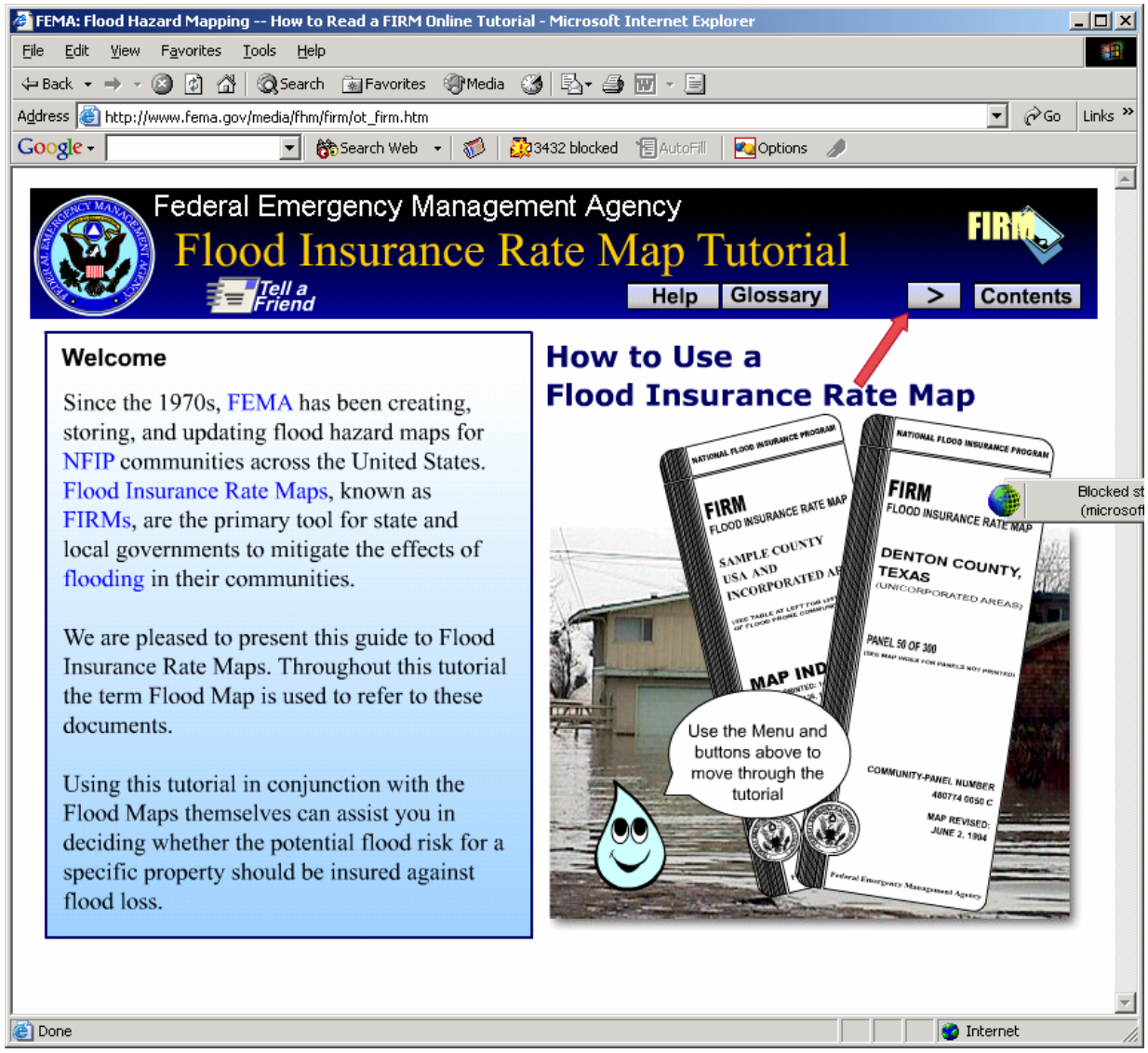
CAUTION !!!

See note on p. 2.

IMPORTANT: GLOSSARY ENTRIES ARE INCLUDED AT THE END OF THIS COURSE MATERIAL.

Clicking again on one of the main topics opens a more detailed listing of that section's contents, as shown below:





IMPORTANT NOTES:

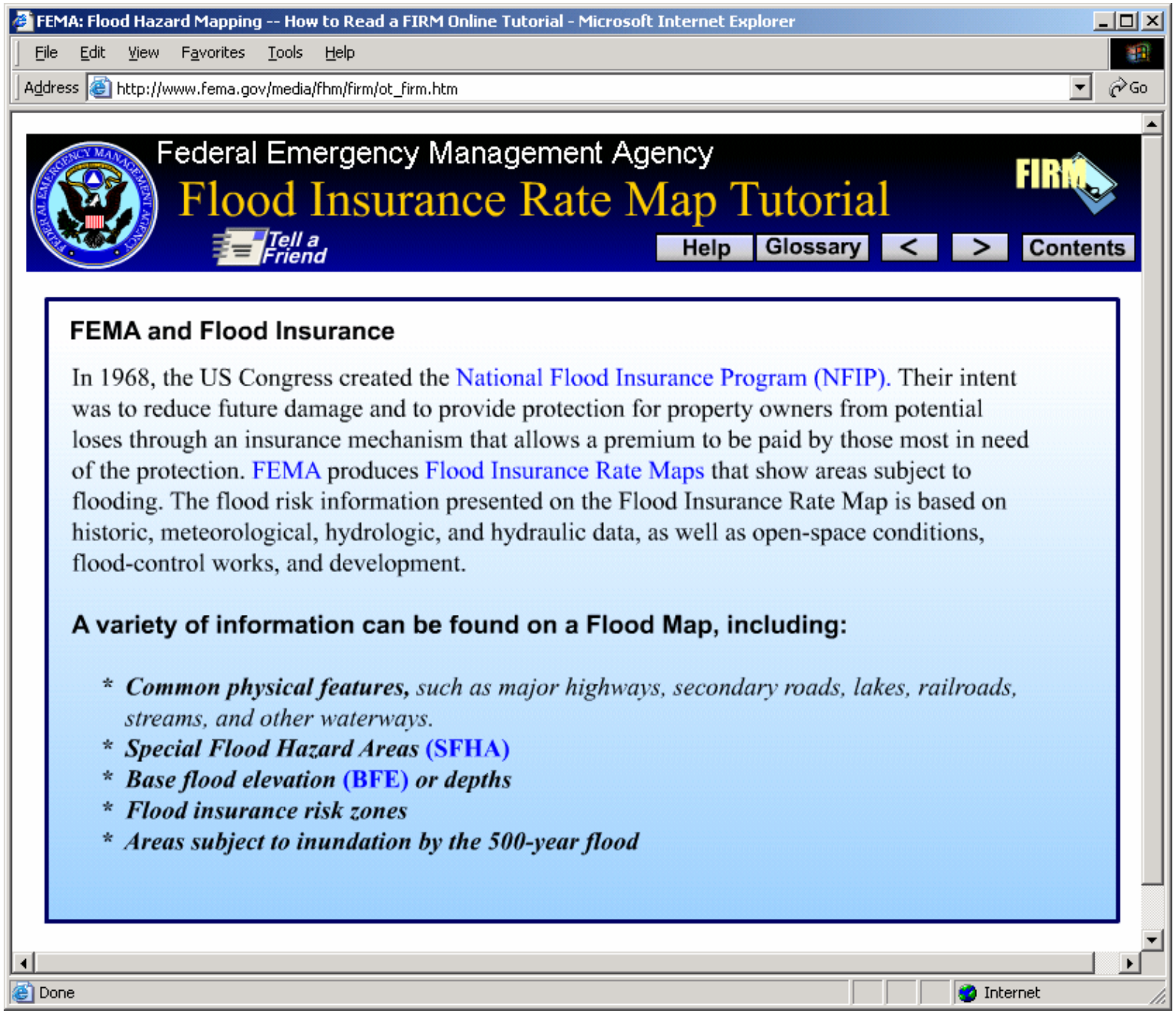
You'll find many of the pages you're about to view display duplicate information in some portion of the screen-captured images.

This is **NOT** a mistake. It was done to convey in this file various animations that appear on the screen when viewing the tutorial "live" on FEMA's site.

In most cases, your course author has presented these animation changes in an attempt to insure you don't miss anything important through viewing the tutorial via this pdf file.

An important element in both FEMA's tutorial and the QUIZ for this course is the information contained in the **Glossary**. These entries are included at the end of this course material, and you should find them very helpful.

J.T.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FEMA and Flood Insurance
In 1968, the US Congress created the National Flood Insurance Program (NFIP). Their intent was to reduce future damage and to provide protection for property owners from potential loses through an insurance mechanism that allows a premium to be paid by those most in need of the protection. FEMA produces Flood Insurance Rate Maps that show areas subject to flooding. The flood risk information presented on the Flood Insurance Rate Map is based on historic, meteorological, hydrologic, and hydraulic data, as well as open-space conditions, flood-control works, and development.
A variety of information can be found on a Flood Map, including:
* Common physical features, such as major highways, secondary roads, lakes, railroads, streams, and other waterways.
* Special Flood Hazard Areas (SFHA)
* Base flood elevation (BFE) or depths
* Flood insurance risk zones
* Areas subject to inundation by the 500-year flood
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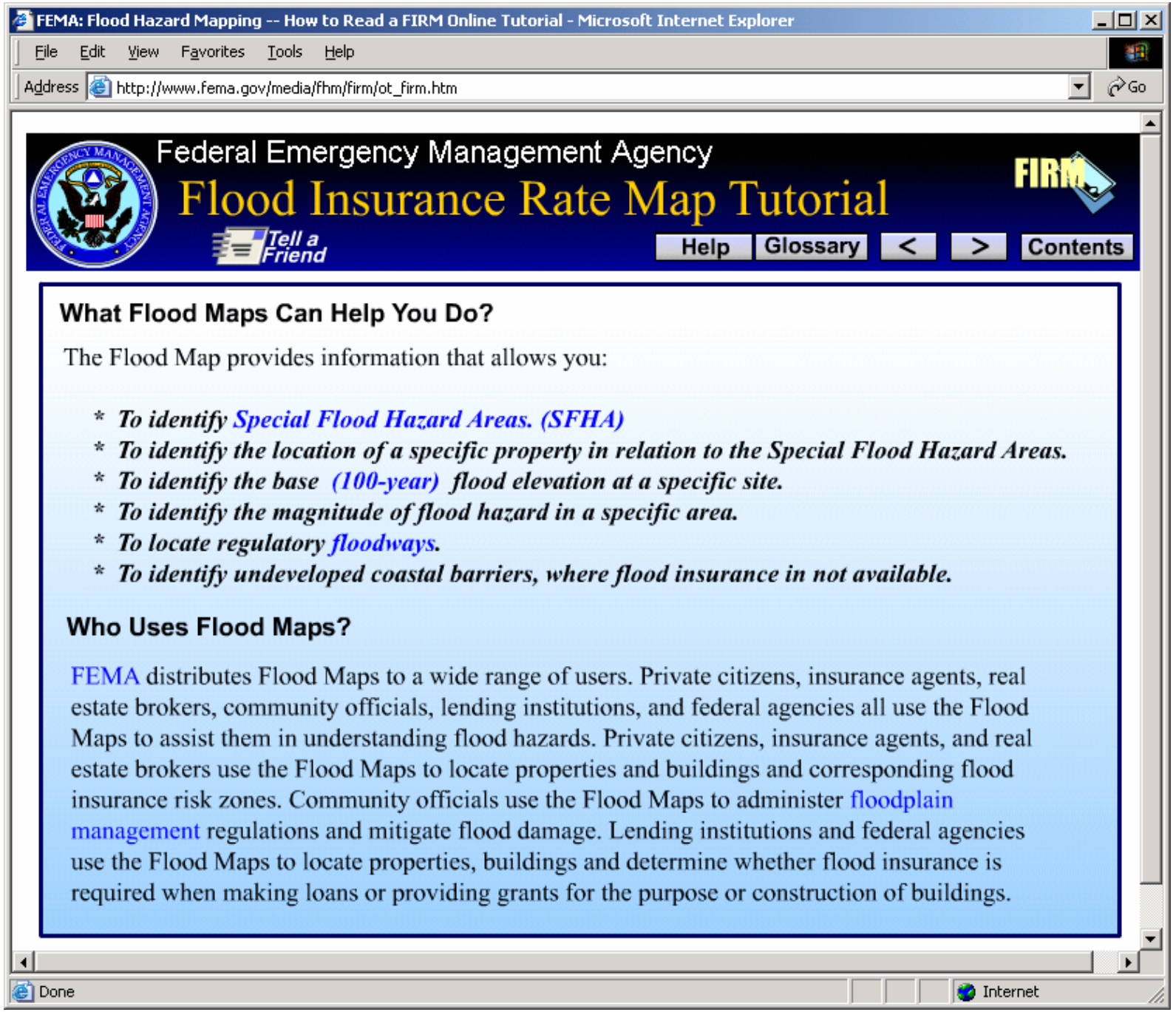
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What Flood Maps Can Help You Do?
The Flood Map provides information that allows you:
* To identify Special Flood Hazard Areas. (SFHA)
* To identify the location of a specific property in relation to the Special Flood Hazard Areas.
* To identify the base (100-year) flood elevation at a specific site.
* To identify the magnitude of flood hazard in a specific area.
* To locate regulatory floodways.
* To identify undeveloped coastal barriers, where flood insurance in not available.
Who Uses Flood Maps?
FEMA distributes Flood Maps to a wide range of users. Private citizens, insurance agents, real estate brokers, community officials, lending institutions, and federal agencies all use the Flood Maps to assist them in understanding flood hazards. Private citizens, insurance agents, and real estate brokers use the Flood Maps to locate properties and buildings and corresponding flood insurance risk zones. Community officials use the Flood Maps to administer floodplain management regulations and mitigate flood damage. Lending institutions and federal agencies use the Flood Maps to locate properties, buildings and determine whether flood insurance is required when making loans or providing grants for the purpose or construction of buildings.
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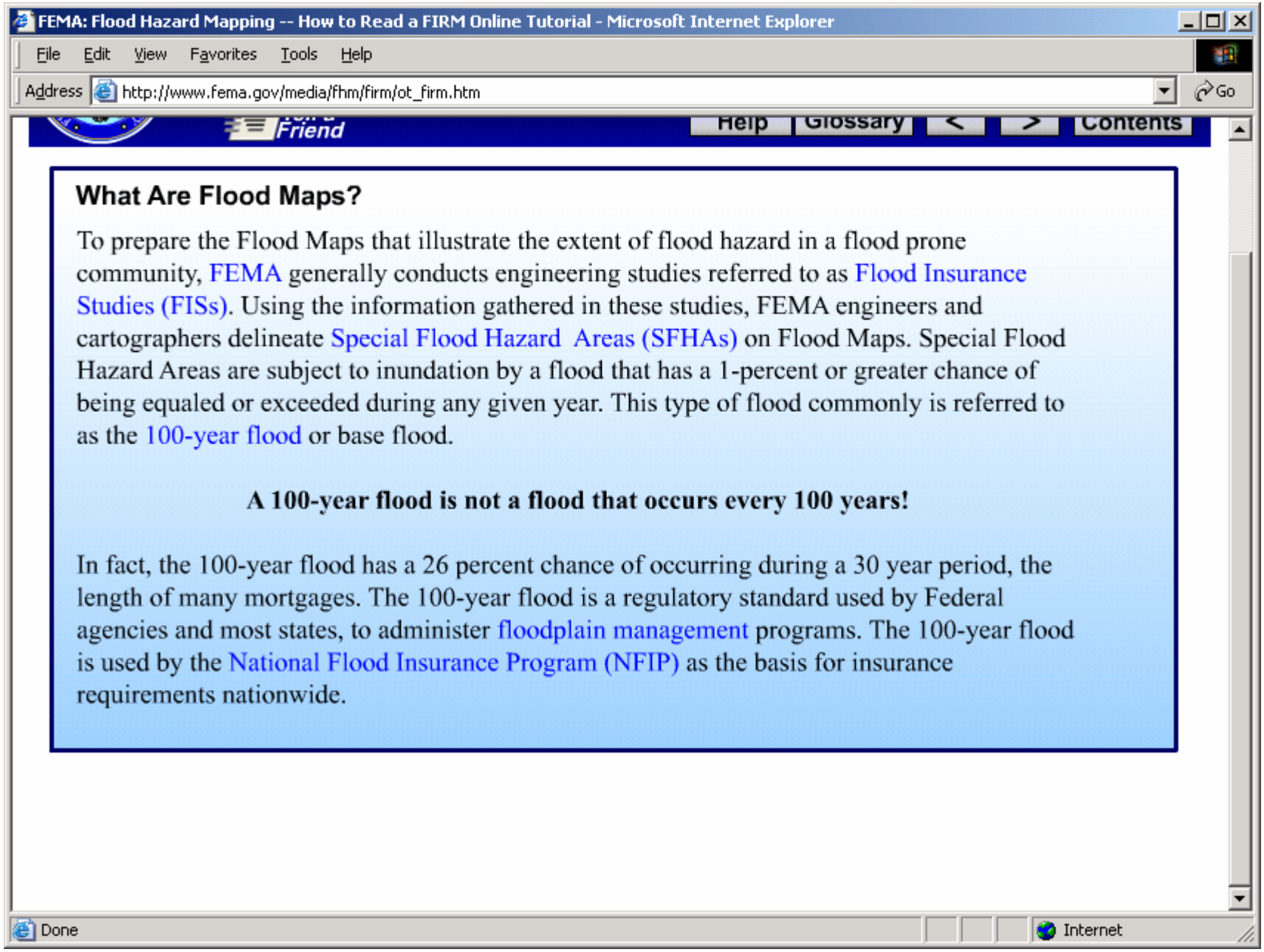
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What Are Flood Maps?
To prepare the Flood Maps that illustrate the extent of flood hazard in a flood prone community, FEMA generally conducts engineering studies referred to as Flood Insurance Studies (FISs). Using the information gathered in these studies, FEMA engineers and cartographers delineate Special Flood Hazard Areas (SFHAs) on Flood Maps. Special Flood Hazard Areas are subject to inundation by a flood that has a 1-percent or greater chance of being equaled or exceeded during any given year. This type of flood commonly is referred to as the 100-year flood or base flood.
A 100-year flood is not a flood that occurs every 100 years!
In fact, the 100-year flood has a 26 percent chance of occurring during a 30 year period, the length of many mortgages. The 100-year flood is a regulatory standard used by Federal agencies and most states, to administer floodplain management programs. The 100-year flood is used by the National Flood Insurance Program (NFIP) as the basis for insurance requirements nationwide.
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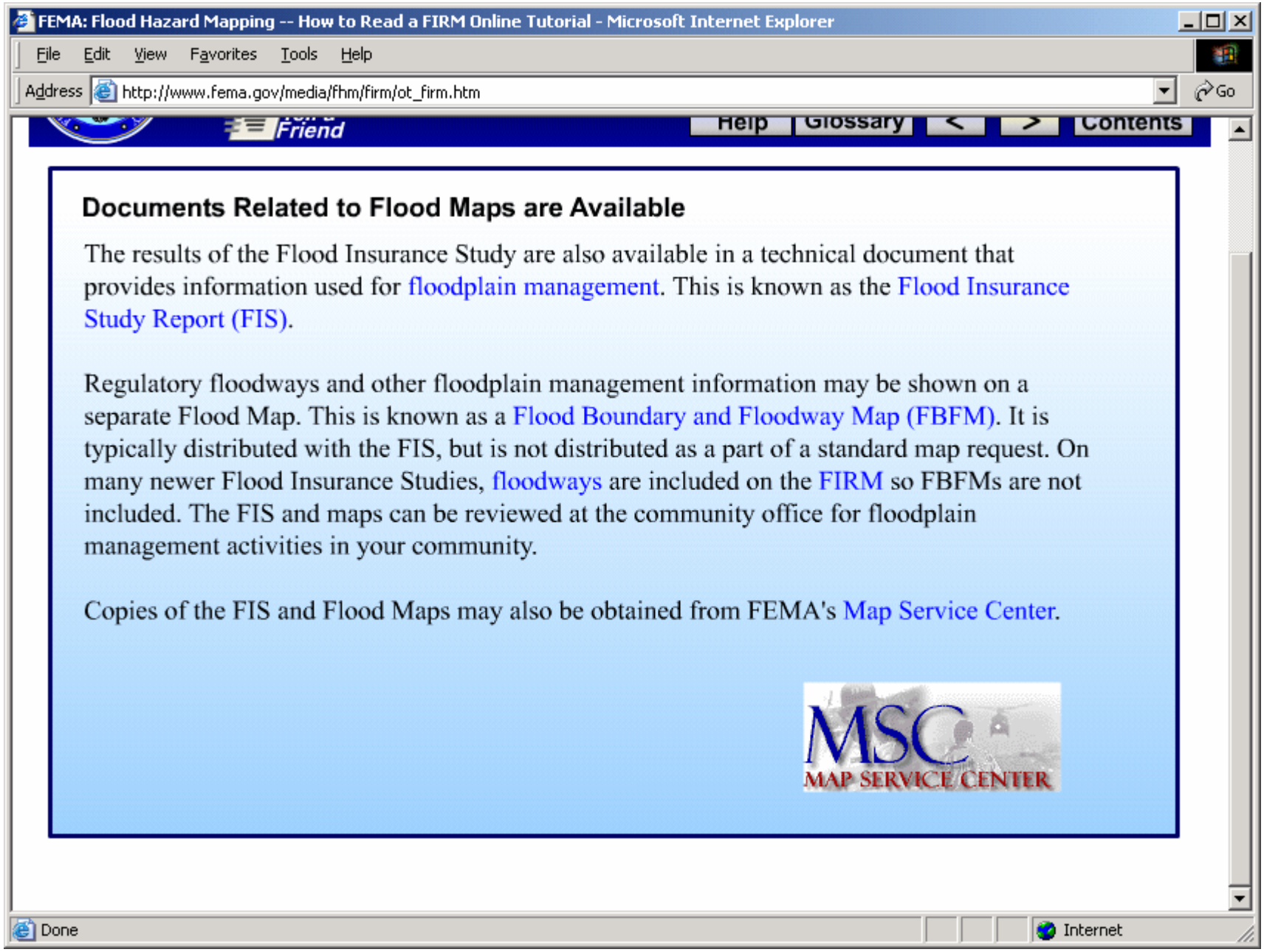
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Documents Related to Flood Maps are Available
The results of the Flood Insurance Study are also available in a technical document that provides information used for floodplain management. This is known as the Flood Insurance Study Report (FIS).
Regulatory floodways and other floodplain management information may be shown on a separate Flood Map. This is known as a Flood Boundary and Floodway Map (FBFM). It is typically distributed with the FIS, but is not distributed as a part of a standard map request. On many newer Flood Insurance Studies, floodways are included on the FIRM so FBFMs are not included. The FIS and maps can be reviewed at the community office for floodplain management activities in your community.
Copies of the FIS and Flood Maps may also be obtained from FEMA's Map Service Center.
MSC
MAP SERVICE CENTER
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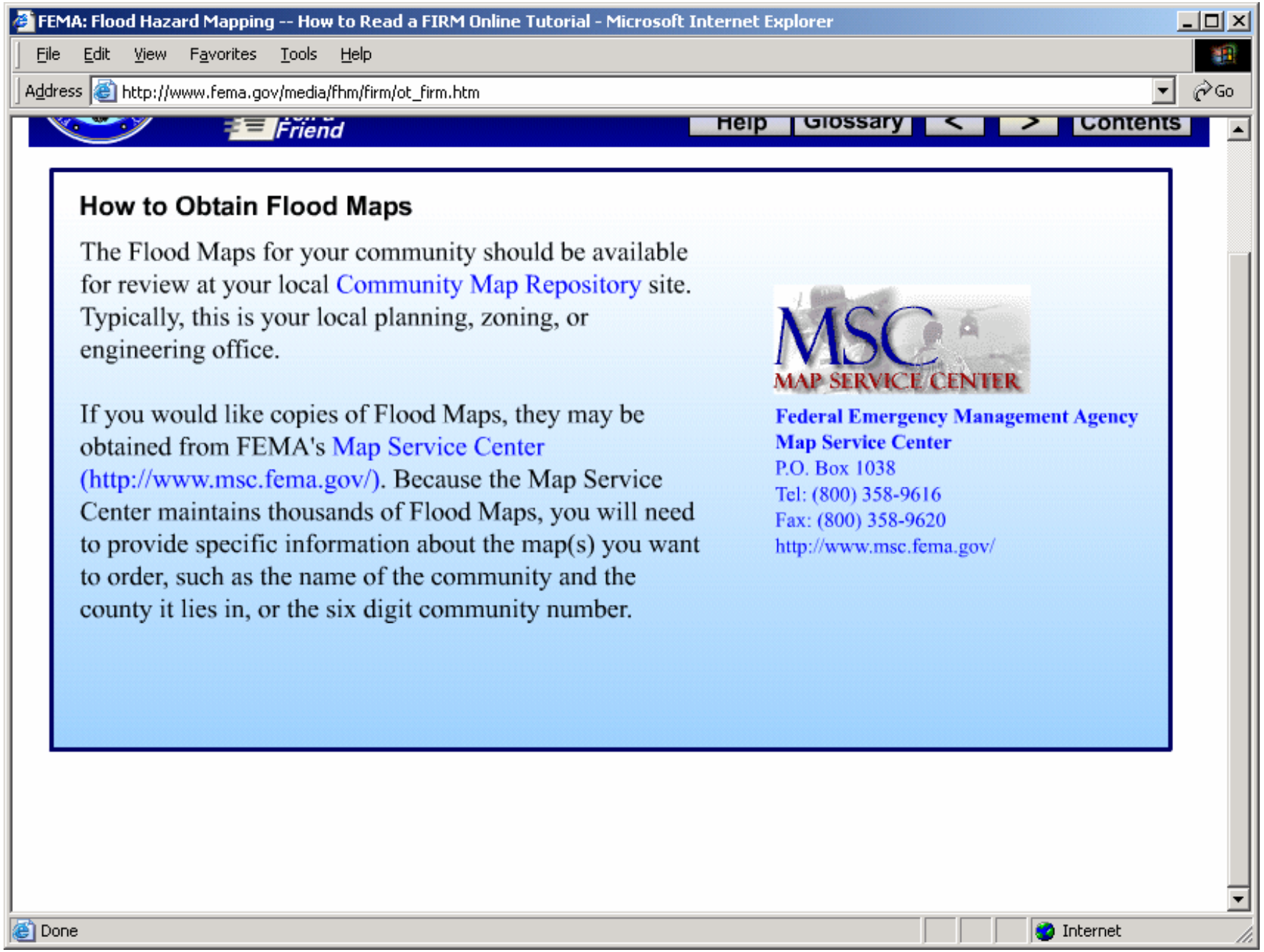
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How to Obtain Flood Maps
The Flood Maps for your community should be available for review at your local Community Map Repository site. Typically, this is your local planning, zoning, or engineering office.
If you would like copies of Flood Maps, they may be obtained from FEMA's Map Service Center (http://www.msc.fema.gov/). Because the Map Service Center maintains thousands of Flood Maps, you will need to provide specific information about the map(s) you want to order, such as the name of the community and the county it lies in, or the six digit community number.
MSC
MAP SERVICE CENTER
Federal Emergency Management Agency
Map Service Center
P.O. Box 1038
Tel: (800) 358-9616
Fax: (800) 358-9620
http://www.msc.fema.gov/
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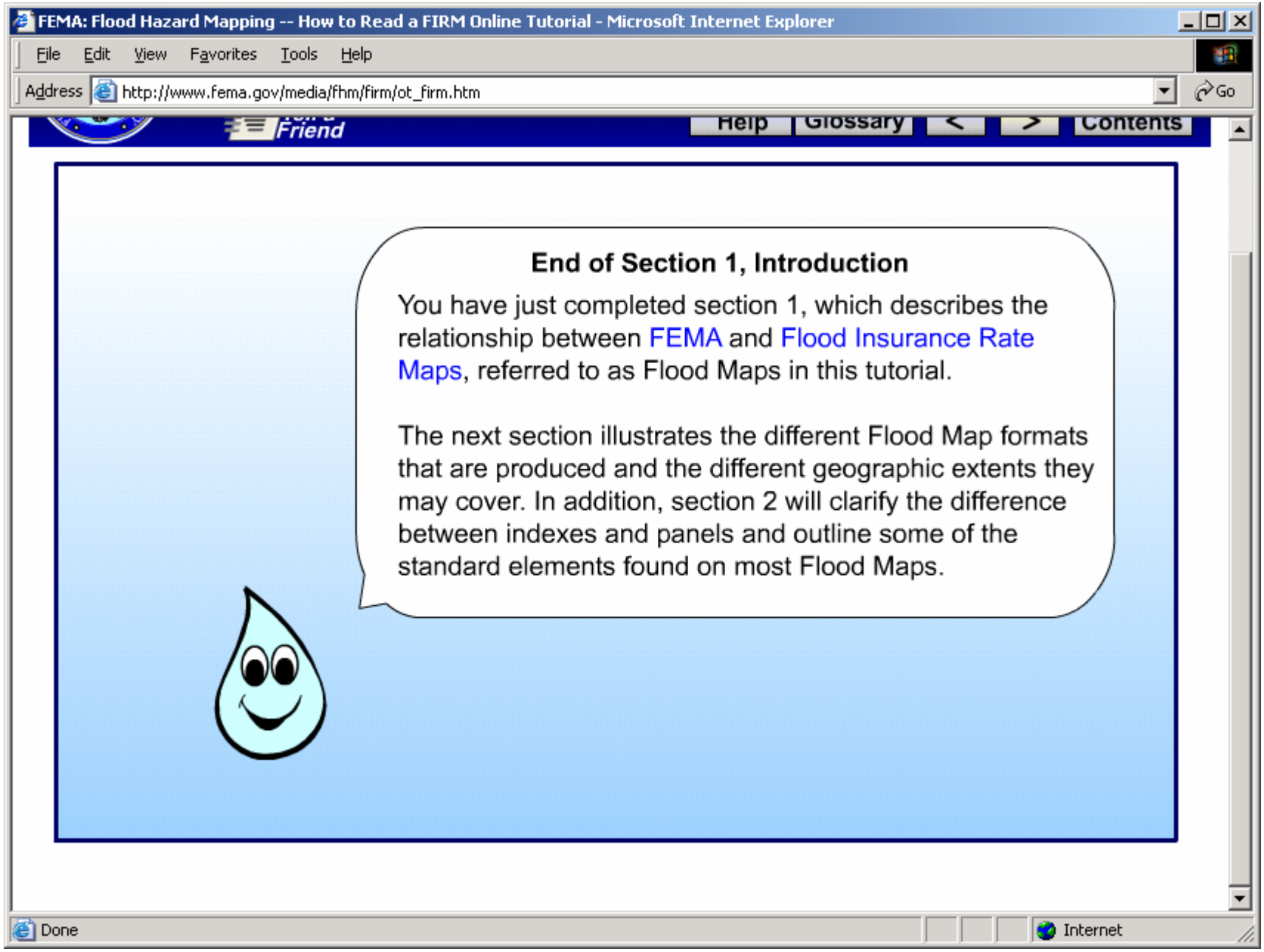
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End of Section 1, Introduction
You have just completed section 1, which describes the relationship between FEMA and Flood Insurance Rate Maps, referred to as Flood Maps in this tutorial.
The next section illustrates the different Flood Map formats that are produced and the different geographic extents they may cover. In addition, section 2 will clarify the difference between indexes and panels and outline some of the standard elements found on most Flood Maps.
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FLOOD MAP OVERVIEW

Since the National Flood Insurance Program began over 25 years ago, many improvements have been made to the design of Flood Maps, so that they are easier to use and better meet users' needs. To control costs, FEMA includes design improvements in Flood Maps as new maps are produced. These improvements occur on a community-by-community basis. As a result, all Flood Maps are not exactly the same. They may differ in format and content.

The two basic formats used for Flood Maps are a **"Flat Flood Map"** and a **"Z-Fold Flood Map."** In addition, every flood map has several basic elements, such as an associated index map, panel, title box, legend, and standard symbols.

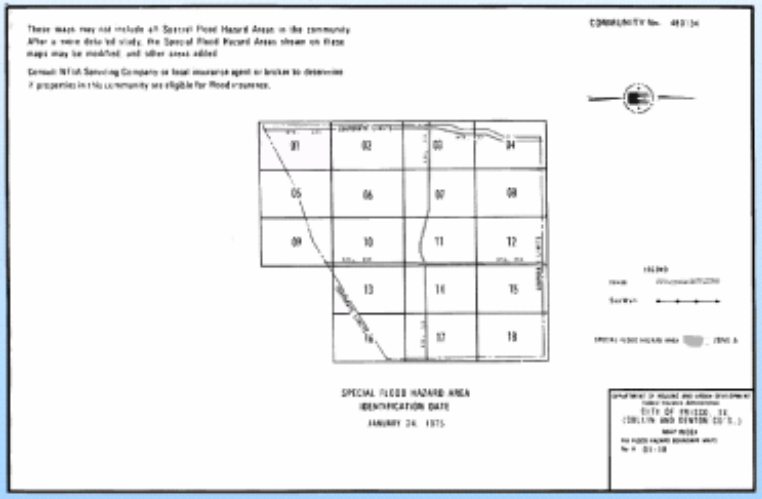

Figure 1 (Flat Flood Map)

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Flood Map Formats

·A **Flat Flood Map** consists of one or more 11"x17" pages and a cover sheet that includes an index and a legend.

·A **Z-Fold Flood Map** is a larger map that is folded like a highway map. Z-Folds consist of one or more panels which, have a legend printed on it. Z-fold Flood Maps involving more than one panel also have an index.

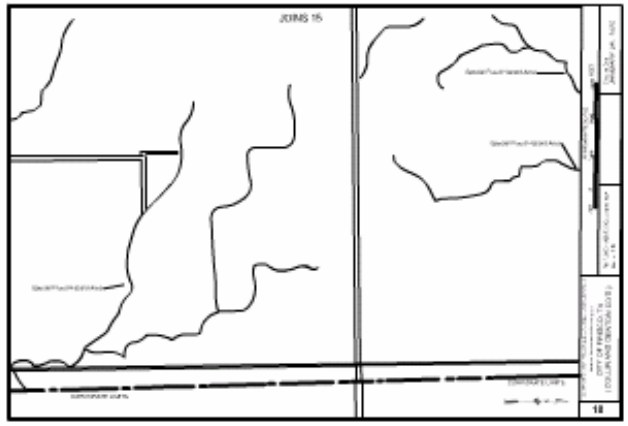

Figure 1. (Flat Flood Map)

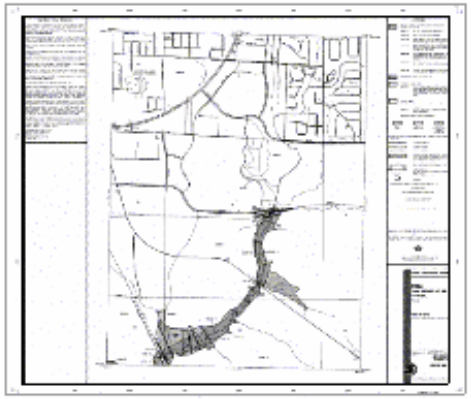

Figure 2. (Z-Fold Flood Map)

When discussing Flood Maps, it is common to refer to the set of panels that make up a geographic area as one Flood Map. More >>>

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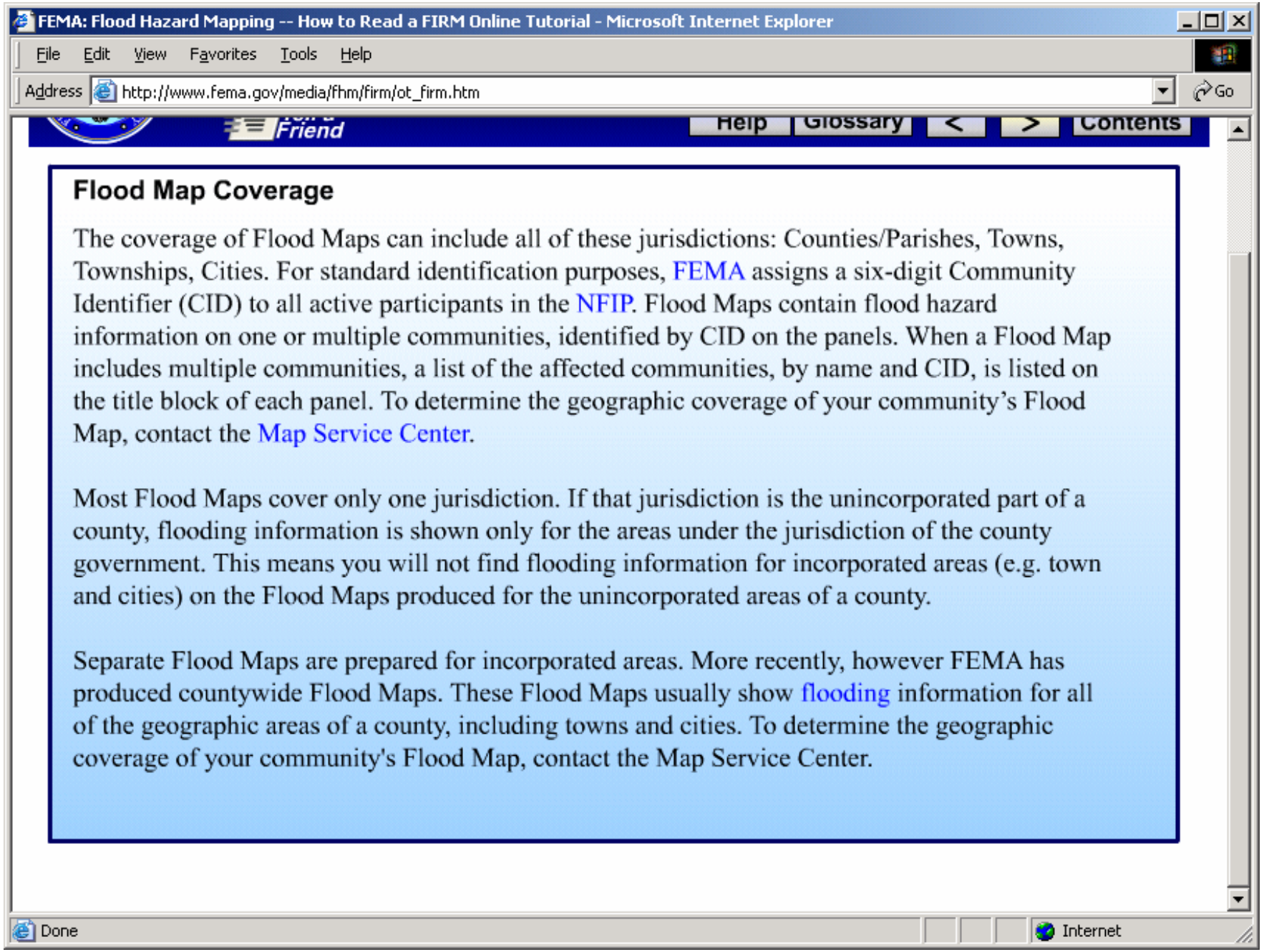
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Flood Map Coverage
The coverage of Flood Maps can include all of these jurisdictions: Counties/Parishes, Towns, Townships, Cities. For standard identification purposes, FEMA assigns a six-digit Community Identifier (CID) to all active participants in the NFIP. Flood Maps contain flood hazard information on one or multiple communities, identified by CID on the panels. When a Flood Map includes multiple communities, a list of the affected communities, by name and CID, is listed on the title block of each panel. To determine the geographic coverage of your community's Flood Map, contact the Map Service Center.
Most Flood Maps cover only one jurisdiction. If that jurisdiction is the unincorporated part of a county, flooding information is shown only for the areas under the jurisdiction of the county government. This means you will not find flooding information for incorporated areas (e.g. town and cities) on the Flood Maps produced for the unincorporated areas of a county.
Separate Flood Maps are prepared for incorporated areas. More recently, however FEMA has produced countywide Flood Maps. These Flood Maps usually show flooding information for all of the geographic areas of a county, including towns and cities. To determine the geographic coverage of your community's Flood Map, contact the Map Service Center.
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The Index

The index serves as a guide to map sheets found on a Flood Map. Since the geographic coverage of a Flood Map may be quite large, FEMA divides the area into sections called panels. The index is provided to indicate what areas are shown on each map.

Due to variations in content found on Flood Maps, separate formats exist for both Flat Flood and Z-Fold Maps.

See the section on How to Read a Flood Map index for further information on the variations of these maps. When determining flood hazard potential for an area, you should first consult the index to determine which Flood Map panel illustrates your community.

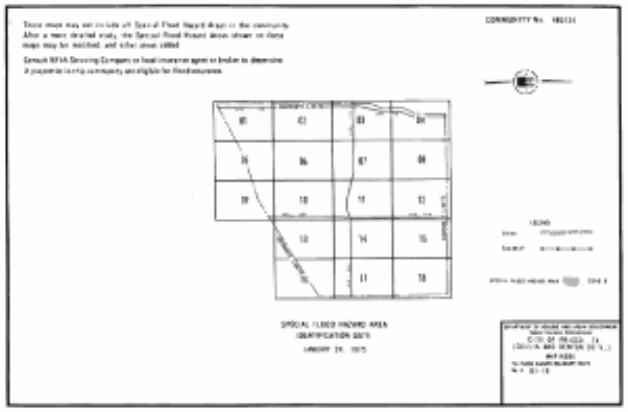

Figure 1 (Flat Flood Map)

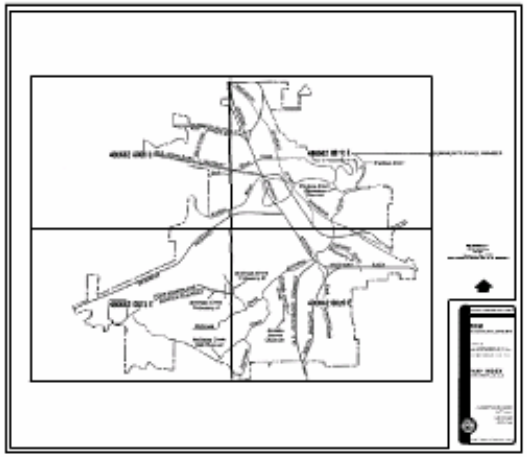

Figure 2 (Z-Fold Flood Map)

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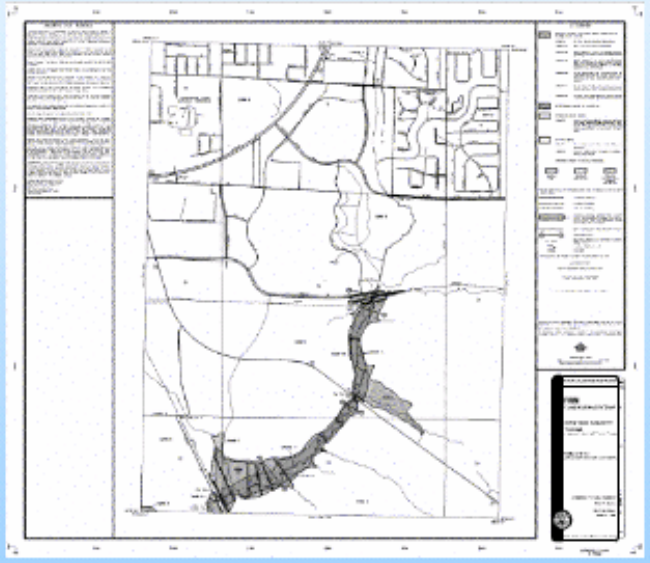
The Panel

The Flood Map for your community may include one or more individual maps. Each map is called a panel. When a Flood Map contains multiple panels, that simply means that the Flood Map for your community will not fit on one page. The number of panels depends on the community size and the scale(s) of the panels. The index is used to determine which panel should be utilized to obtain flood hazard information for a specific location.



Z-Fold Panel

Click on the "Show Me" button to view a Panel Determination animation

Show Me

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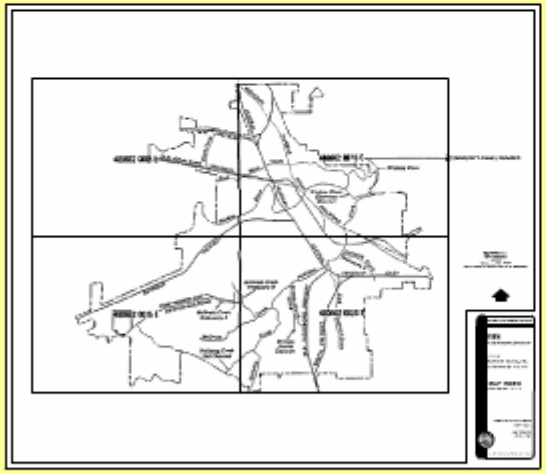
DETERMINING THE CORRECT PANEL

Step 1: Find the index

Step 2: Determine the panel number

Step 3: Locate the panel number on the title box



Community Index Map

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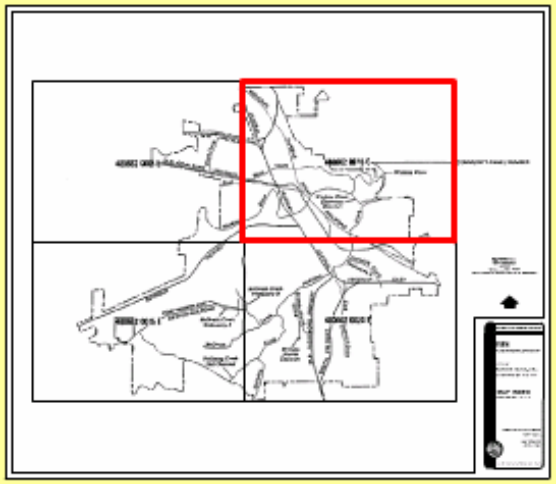

PANEL NUMBER

480774 0050 C

Community Index Map

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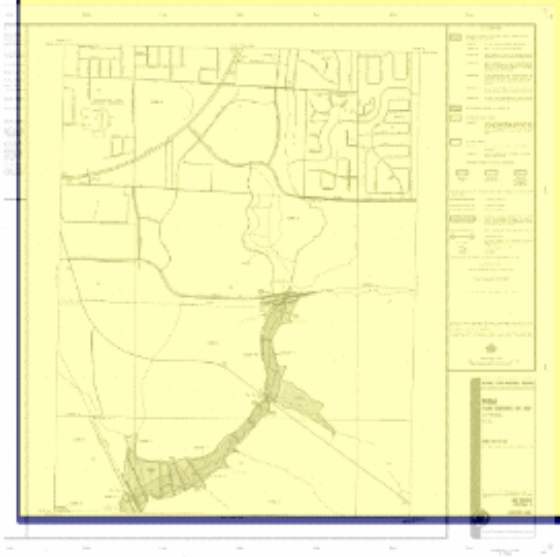

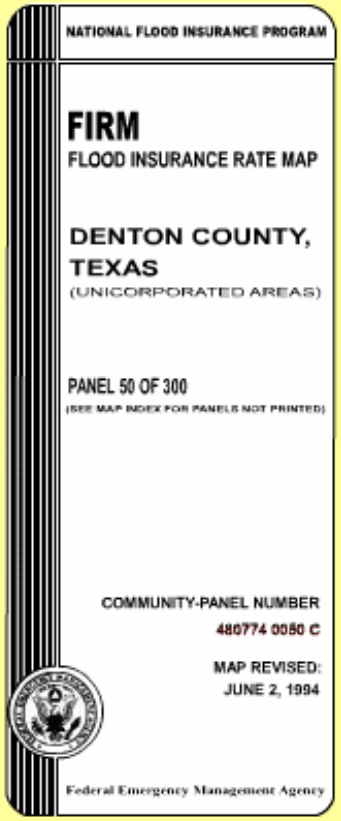

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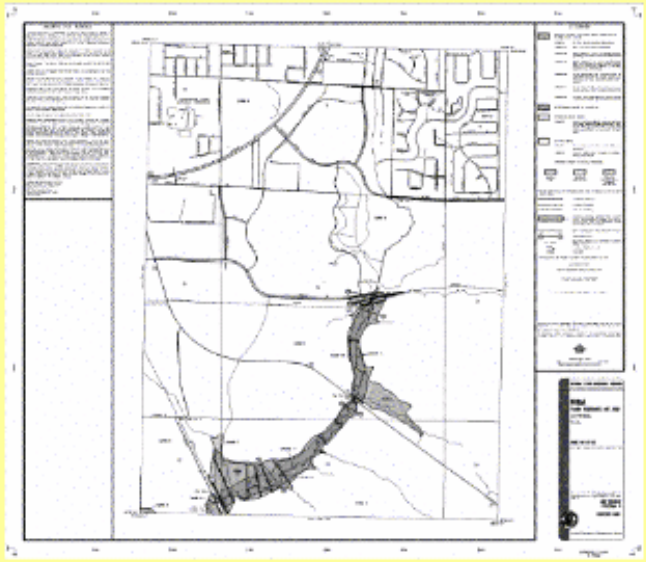

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Flood Map Basics

In addition to the two basic formats, Flood Maps also have several basic elements. Every Flood Map will include a title box, legend, body, and basic symbols.

In this section elements common to all Flood Maps are illustrated. However, as you view the rest of this tutorial, keep in mind that due to variations in format and content, not all elements appear on every Flood Map.

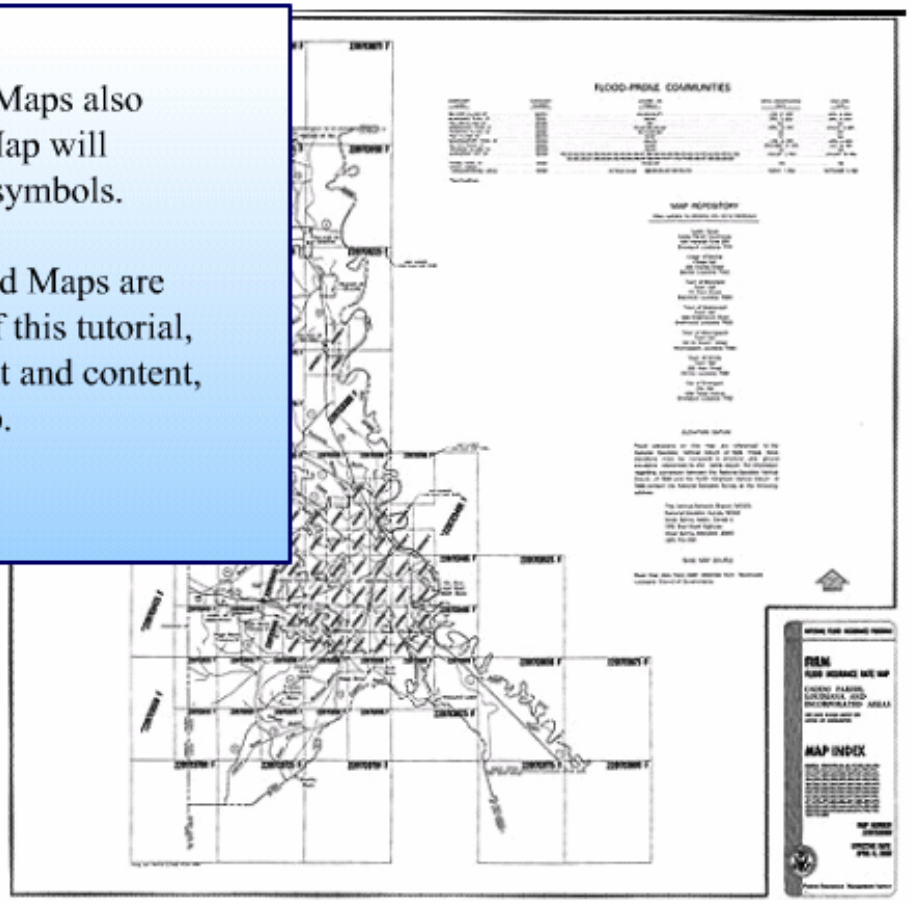

Figure 3. Countywide Index

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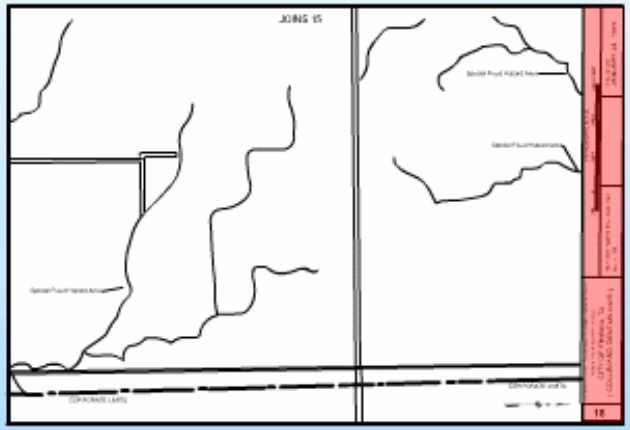
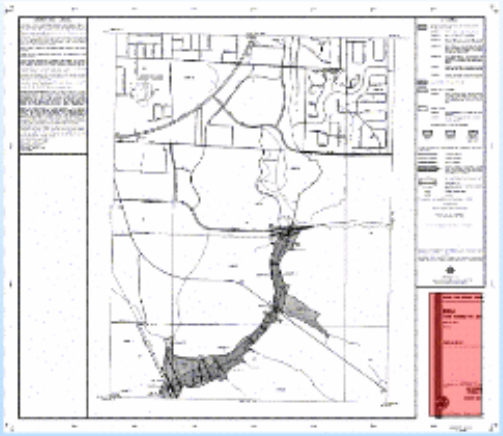
The Title Block

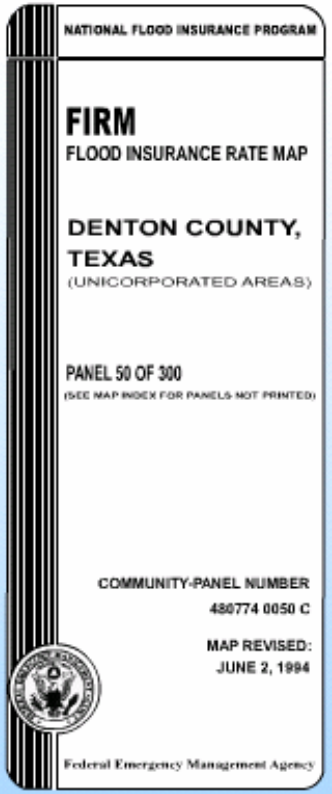
The Title Block - Found on each panel (map), the title box contains the community name, the panel number (page number), date, and other information necessary to identify the Flood Map panel.

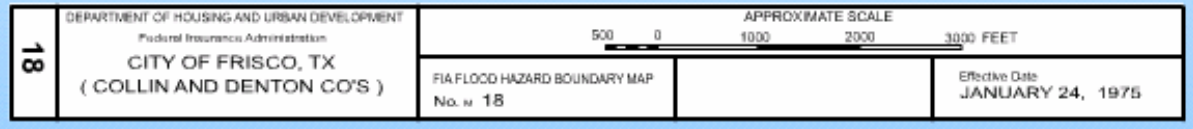


Flat Panel



Z-Fold Panel





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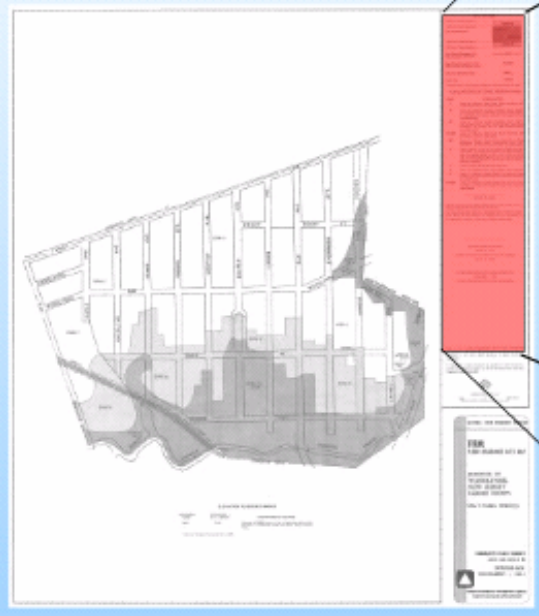
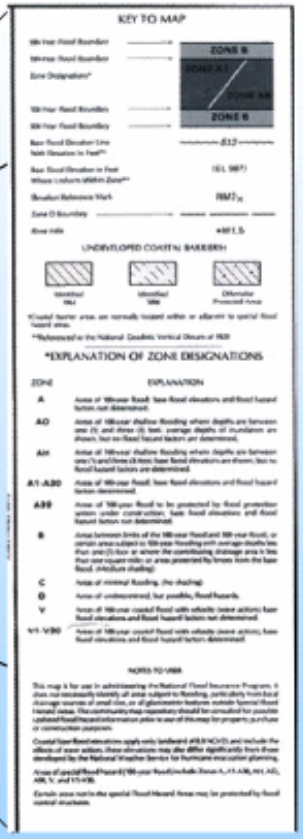
The Legend

Legend / Key to Map - Found on Z-fold Flood Maps, the Legend provides information for identifying the risk zones and/or floodway on the Flood Map.





Z-Fold format for an individual community

Done

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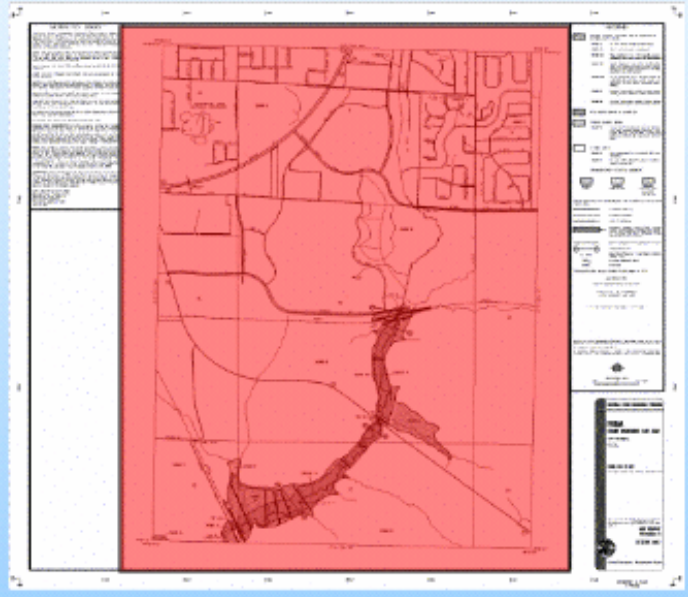
The Body

The body of a Flood Map displays the map contents. On an index, the body will usually only display primary features like major roads, corporate limits and other general landmarks that help to identify location. On a panel, the body will show more detail than what is shown on the index, including secondary roads, bridges, and flood hazard information.

In addition, every map regardless of format will contain a typical set of symbology as noted on the next slide.



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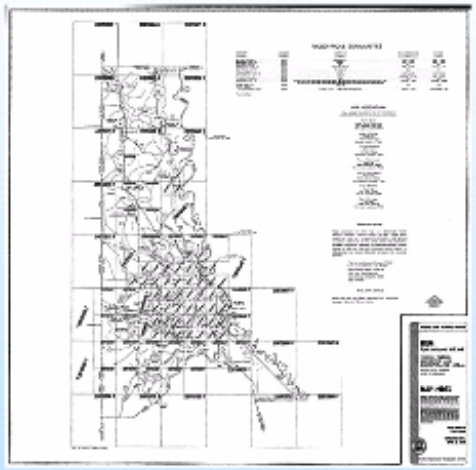
Typical Flood Map Elements:

- Community Name
- Community or Map Number
- Corporate Limits or County Line
- Inset Note
- North Arrow
- Panel Limit Line
- Panel-not-Printed Notes



These seven items are typically found on all FEMA Flood Maps regardless of the format or the area covered by the Flood Map. Other items may be found on specific Flood Maps depending upon the formats and geographic area, these will be discussed later in this tutorial. *Click on the "bullets" to view an example of each element.*

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Typical Flood Map Elements:

- *Community Name*
- Community or Map Number
- Corporate Limit or County Line
- Inset Note
- North Arrow
- Panel Limit Line
- Panel-not-Printed Notes

SAMPLE COUNTY
USA AND
INCORPORATED AREAS

Community Name:
The title block displays name of the mapped community, the community type (e.g. town, city, county), the county, and the state. When the mapped community is a county, the words "Unincorporated Areas" often appear below the county name. This indicates that the incorporated areas in the county area not covered by the Flood Map. When the Flood Map covers entire geographic area of the county, the words "and Incorporated Areas" appear after the county name.

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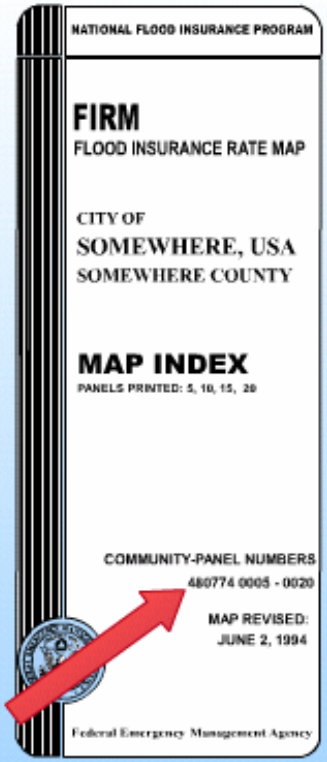
Typical Flood Map Elements:

- Community Name
- *Community or Map Number*
- Corporate Limit or County Line
- Inset Note
- North Arrow
- Panel Limit Line
- Panel-not-Printed Notes

COMMUNITY-PANEL NUMBERS

480774 0005 - 0020



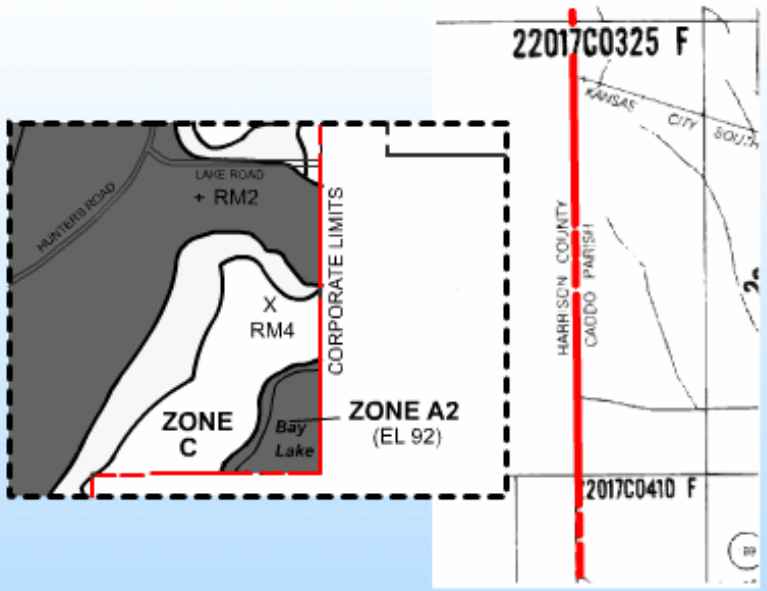
Community Number:

The Community Number is a six-digit identification number assigned to the mapped community. This number is also referred to as the community identification number (CID). You need to use the community identification number when you ask FEMA staff questions about a Flat Flood Map or a Z-fold Flood Map for an individual community and when your order a Flood Map from the Map Service Center.

Done Internet

Typical Flood Map Elements:

- Community Name
- Community or Map Number
- *Corporate Limit or County Line*
- Inset Note
- North Arrow
- Panel Limit Line
- Panel-not-Printed Notes



Corporate Limits or County Line:

The corporate limit or county line identifies the jurisdictional limits of the community's regulatory authority over land development and building construction. In some states, an incorporated community may exercise extraterritorial jurisdiction over land development and building construction in areas beyond its corporate limits. Where appropriate, these limits are shown and labeled on the index.

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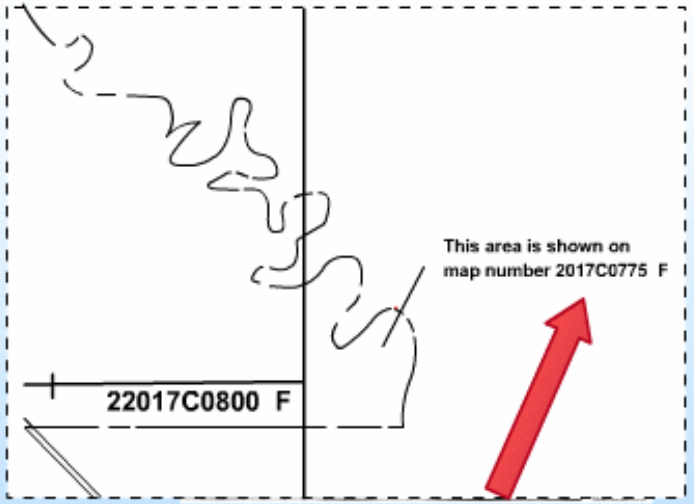
Typical Flood Map Elements:

- Community Name
- Community or Map Number
- Corporate Limit or County Line
- *Inset Note*
- North Arrow
- Panel Limit Line
- Panel-not-Printed Notes



Inset Note:

Inset notes identify what panel includes special areas on the map.

Done Internet

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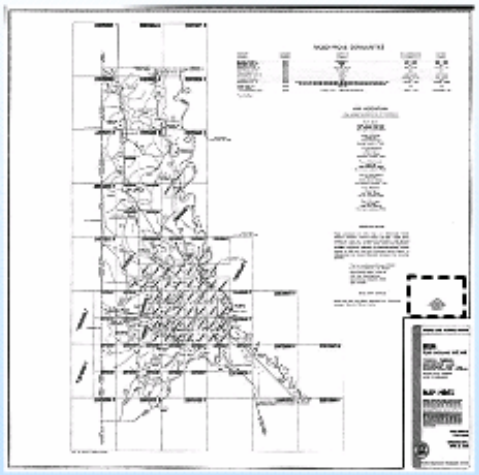
Typical Flood Map Elements:

- Community Name
- Community or Map Number
- Corporate Limit or County Line
- Inset Note
- *North Arrow*
- Panel Limit Line
- Panel-not-Printed Notes

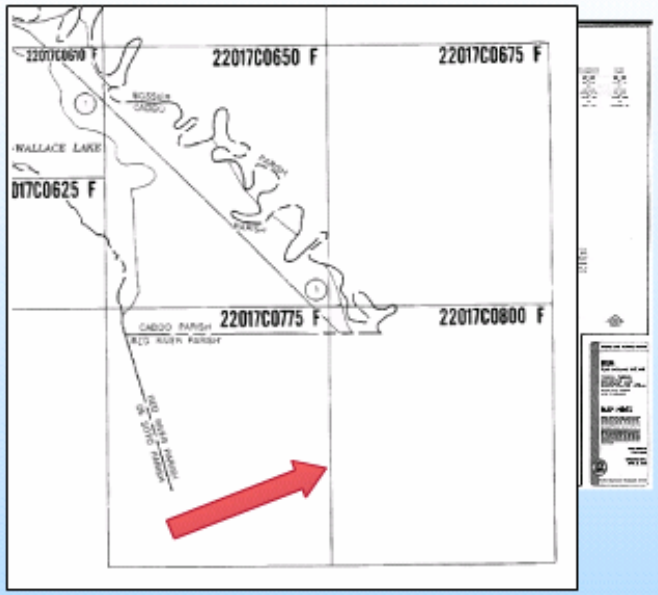


North Arrow - This arrow orients the Flood Map.

Done Internet

Typical Flood Map Elements:

- Community Name
- Community or Map Number
- Corporate Limit or County Line
- Inset Note
- North Arrow
- *Panel Limit Line*
- Panel-not-Printed Notes



Panel Limit Line - This line reveals the extent of the area covered by each panel shown on the index.

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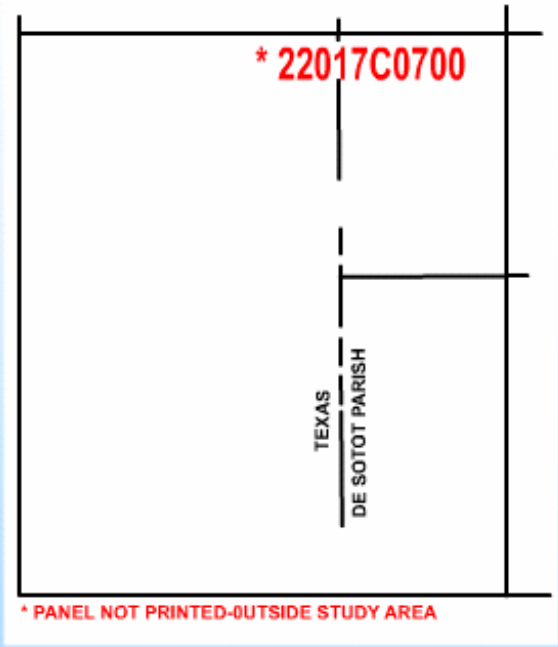
Typical Flood Map Elements:

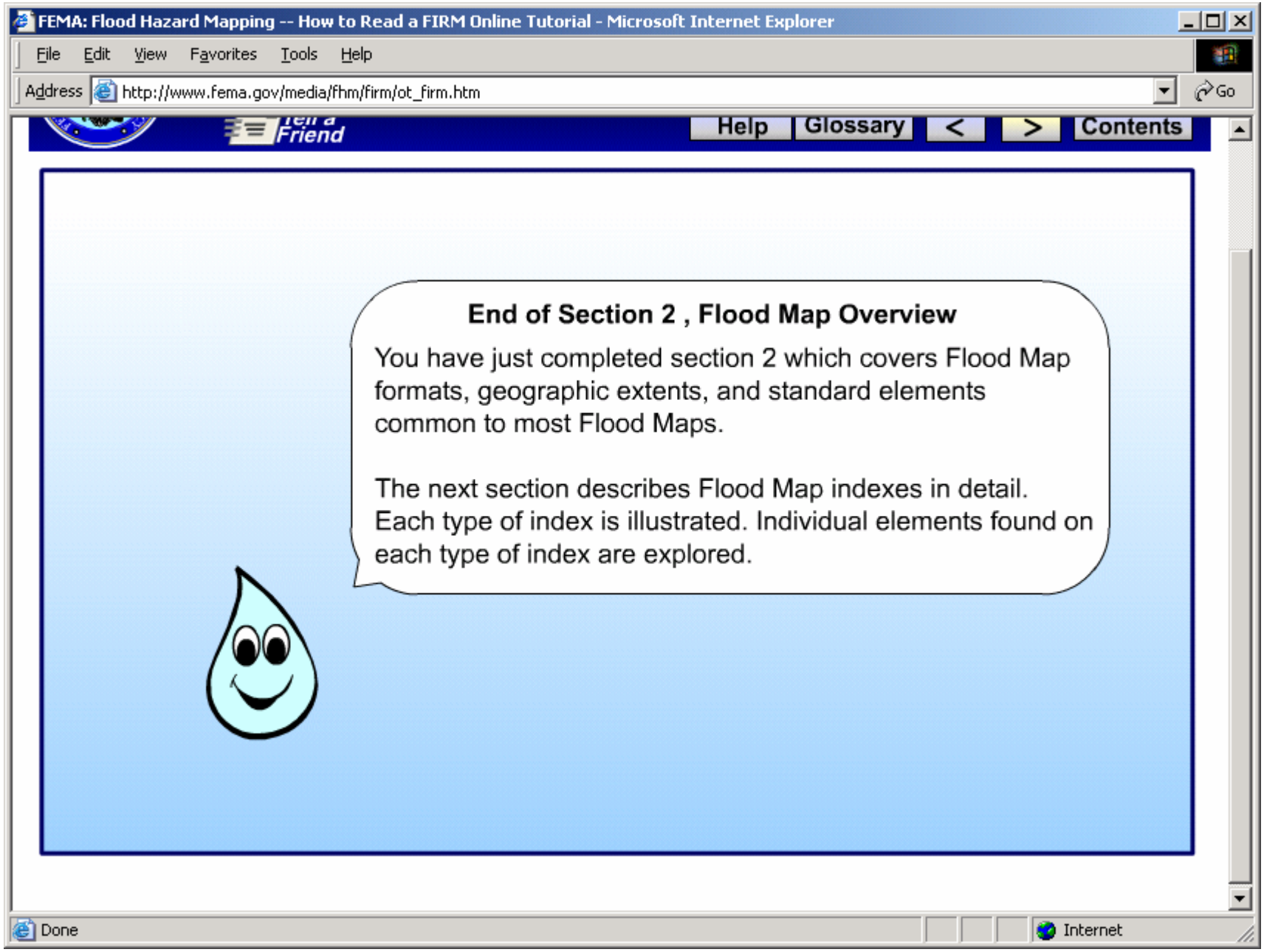
- Community Name
- Community or Map Number
- Corporate Limit or County Line
- Inset Note
- North Arrow
- Panel Limit Line
- *Panel-not-Printed Notes*



Panel-not-Printed Notes:

These notes identify the panels included in the Flood Map layout that are not printed and explain why they are not printed. For instance, when a panel covers an area of the community that falls entirely in one flood insurance risk zone, that panel may not be printed, and an explanatory note is added to the index. If all panels are printed this annotation is omitted.

Done Internet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Contents
End of Section 2 , Flood Map Overview
You have just completed section 2 which covers Flood Map formats, geographic extents, and standard elements common to most Flood Maps.
The next section describes Flood Map indexes in detail. Each type of index is illustrated. Individual elements found on each type of index are explored.
Done
Internet

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HOW TO READ A FLOOD MAP INDEX

Flood Map Indexes

If a Flood Map is composed of more than one panel, an index is usually provided that serves as a guide to the information found on each map. FEMA produces indexes for both Flat Flood and Z-Fold Flood Maps. Regardless of the format, each index is divided into sections that correspond to individual flood map panels.

When determining flood hazard potential for an area, you should first consult the index to determine which flood map panel illustrates the area.

In order to determine your community's flood map format or geographic coverage, you can contact FEMA's Map Service Center to consult a Flood Map Specialist.

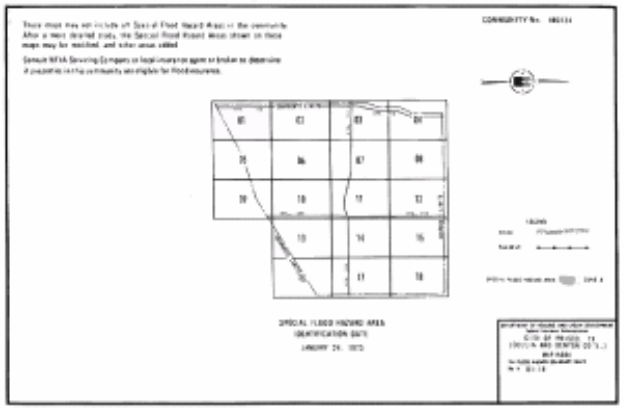


Figure 1 (Flat Flood Map)

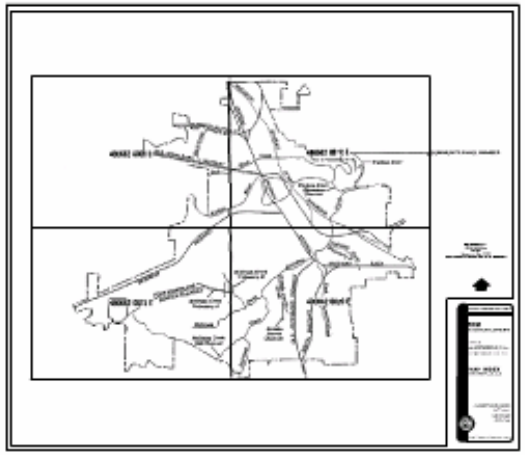
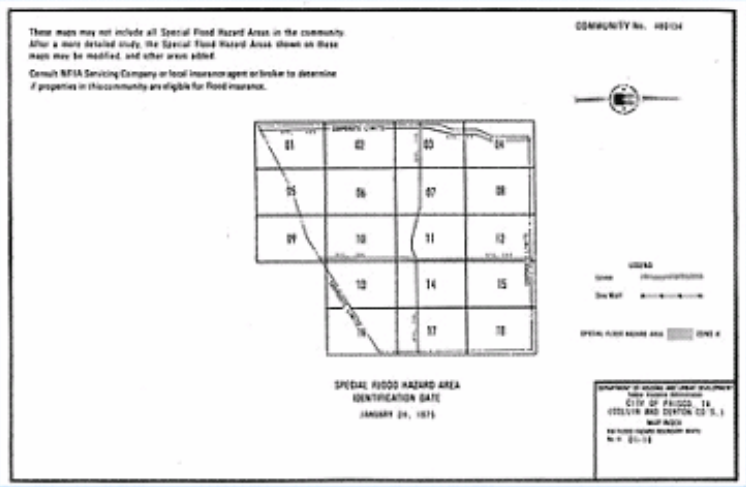


Figure 2 (Z-Fold Flood Map)

Done Internet

Types of Flood Map Indexes

The index shows the outline of the mapped community and the numbers and positions of the individual panels. There are three different types of indexes depending upon the community you are interested in, Flat Flood Maps, Community Flood Maps, and Countywide Flood Maps.



- **Flat Flood Map Index**
- **Community Flood Map Index**
- **Countywide Flood Map Index**

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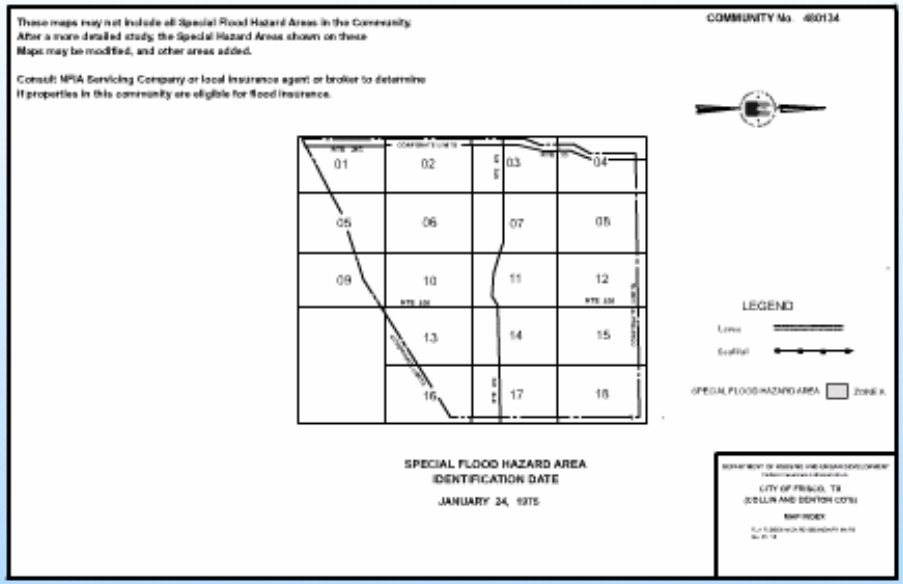
Flat Flood Map Index

Flat Flood Map indexes cover communities that are mapped on 11" x 17" sheets. This index shows the outline of the community and the numbers and positions of the individual panels (sheets). The Flat Flood Map index contains a key to the various flood insurance risk zone designations and important notes to the user. Several important dates are also shown on the index. These dates include the flood insurance rate map effective dates, and dates of revision to the Flood Map. The community name and number will be shown in the title block.



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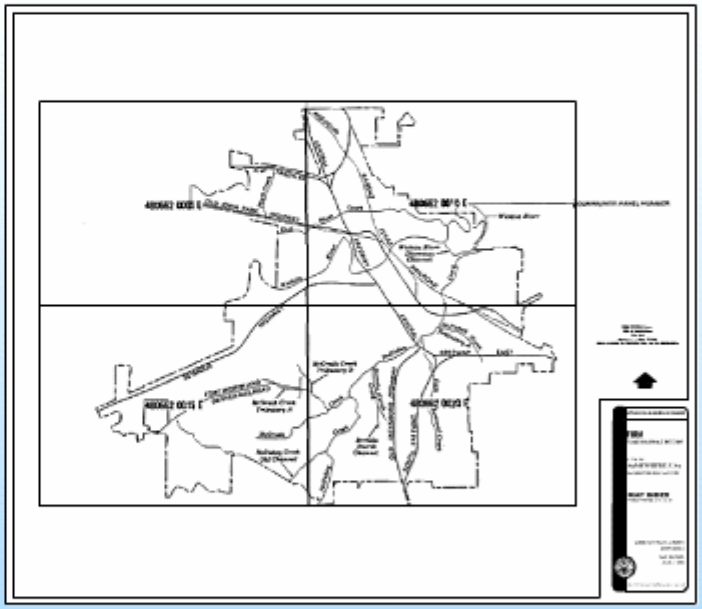
Individual Community Flood Map Index

Individual community indexes range in size. The smallest being 8½" x 11" to the largest 37½"x 25½". These index maps show the community boundary and the number and position of the individual panels. Individual community indexes do not have a legend and general panel notes to the user.

The title block contains the community name, community number and the lowest and highest panels included in the layout of the Flood Map.

The community number and panel number are combined into a 10-digit number for each panel. A map repository listing or street may be included on some indexes.



Community Map Repository
The location where a community`s flood maps are kept; usually the local zoning and planning office.

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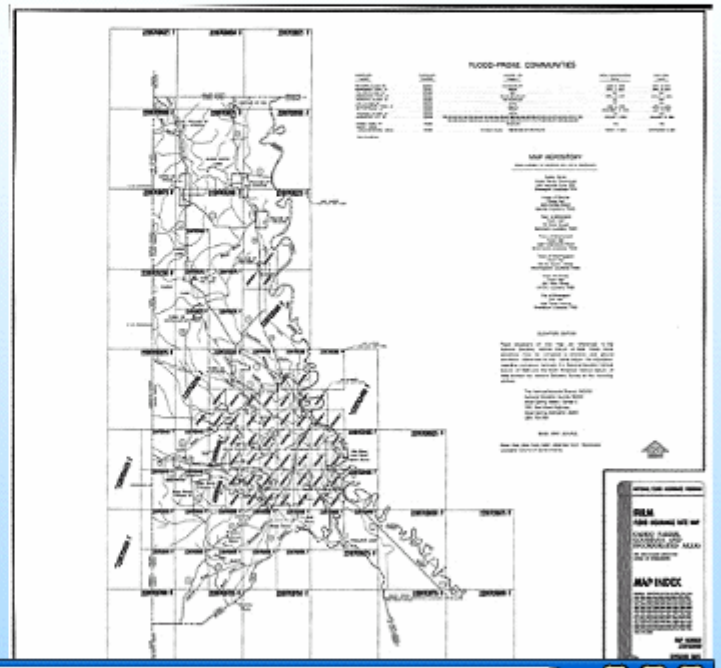
Countywide Flood Map Index

A Countywide Flood Map displays an entire county and any incorporated areas. Countywide Flood Maps may include more than one community. As with all indexes the community boundaries are shown along with the numbers and position of the individual panels. All panels may not be printed so "Panels Printed" are listed in the title block. Some indexes may contain a generalized depiction of the Special Flood Hazard Area shown on each panel, this is for reference purposes only. On selected index maps, a flood-prone streets index may be included that lists flood-prone streets on the Flood Map. Occasionally, there are exceptions where a community that falls within the area of a countywide Flood Map may continue to be shown on a separate Flood map.



Special Flood Hazard Area (SFHA)
Area inundated by the base (1-percent annual chance) flood, identified on the Flood Insurance Rate Map as Zones A, AE, AH, AO, AR, V, VE, or A99.

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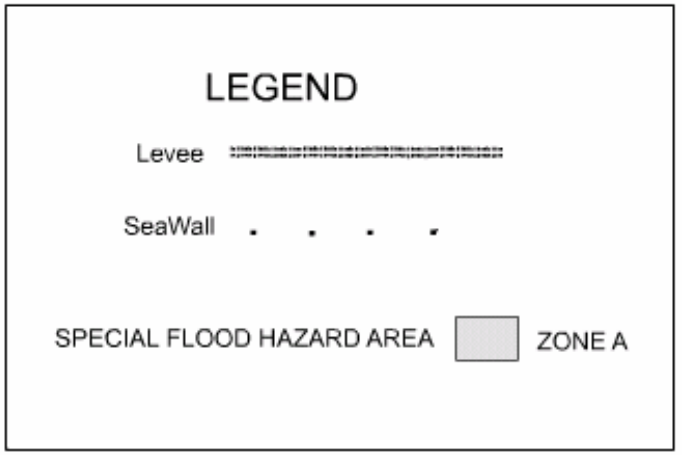
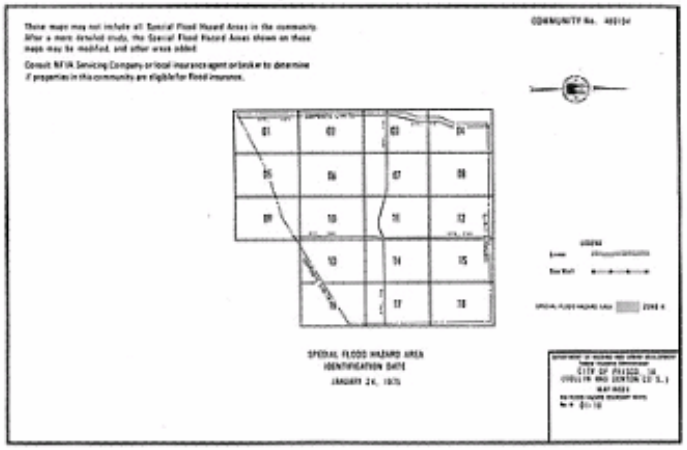
Elements Found Only on a Flat Flood Map Index

Legend - This is the map key that identifies the symbols on the Flood Map and provides information to assist users of the Flood Map, including explanations of the various flood insurance risk zone designations.

Notes to User - These notes provide important additional information about the flood map.



Legend

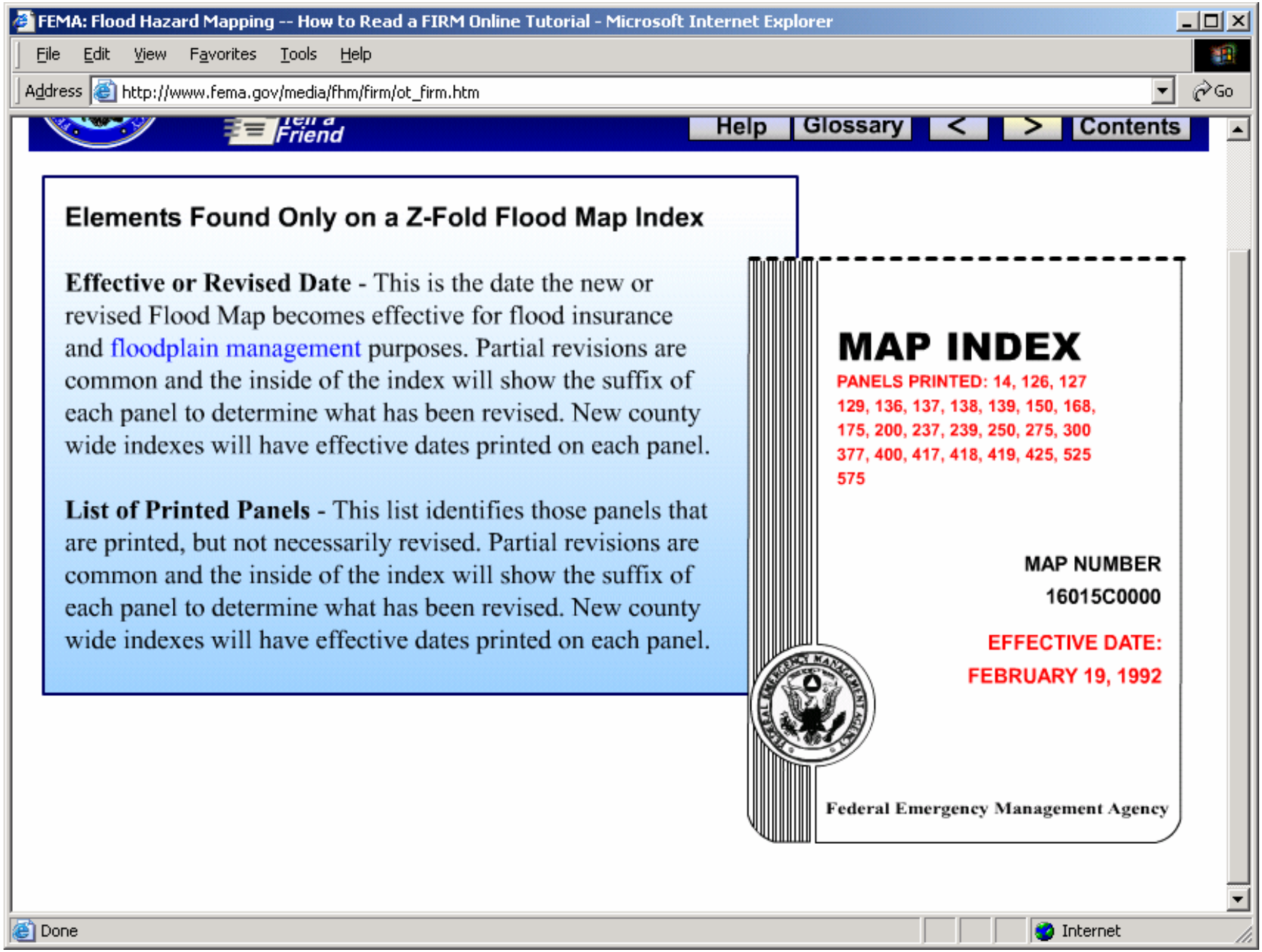


These maps may not include all Special Flood Hazard Areas in the Community. After a more detailed study, the Special Hazard Areas shown on these Maps may be modified, and other areas added.

Consult NFIA Servicing Company or local insurance agent or broker to determine if properties in this community are eligible for flood insurance.

Notes to User

Done Internet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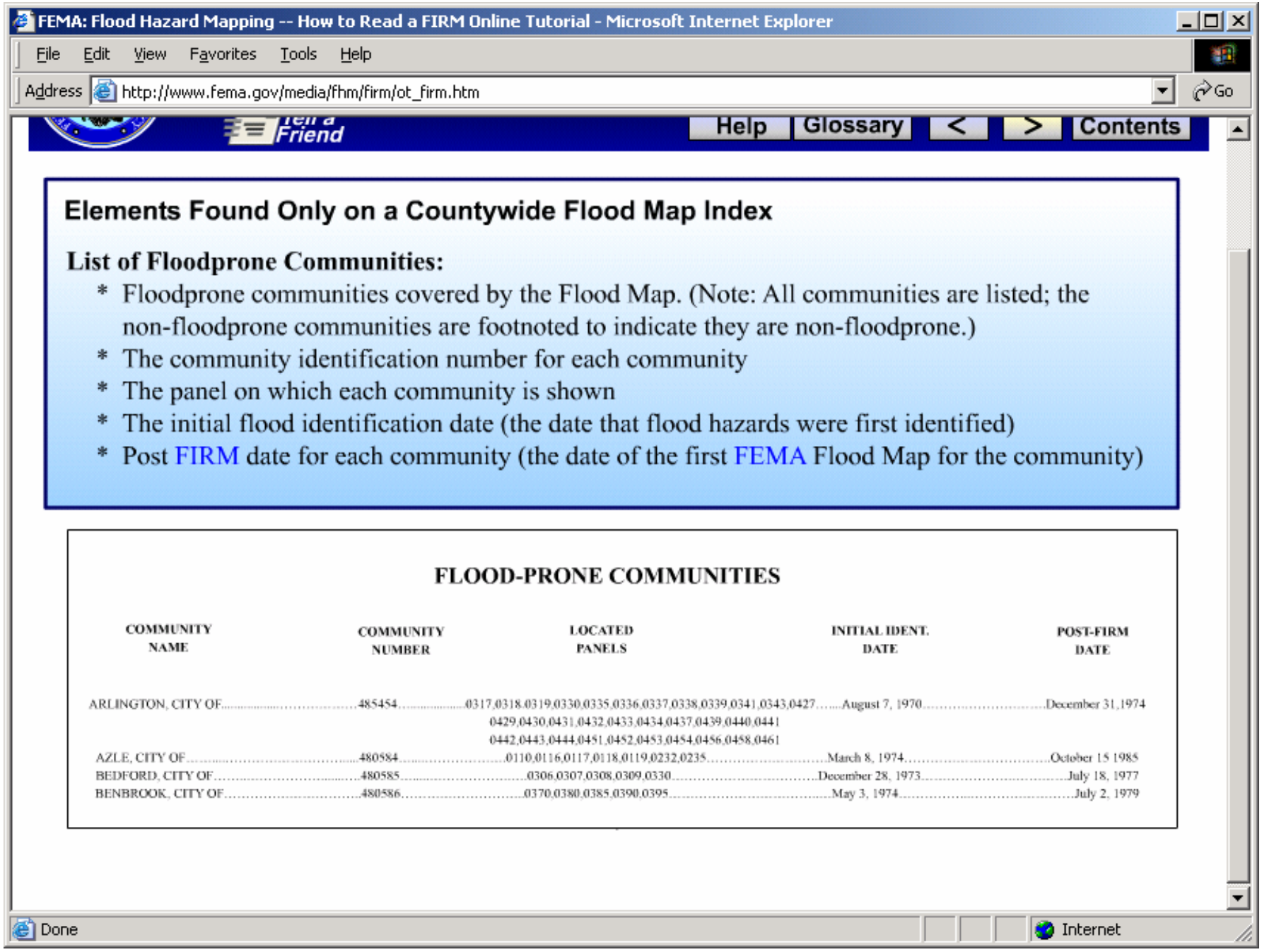
Elements Found Only on a Z-Fold Flood Map Index
Effective or Revised Date - This is the date the new or revised Flood Map becomes effective for flood insurance and floodplain management purposes. Partial revisions are common and the inside of the index will show the suffix of each panel to determine what has been revised. New county wide indexes will have effective dates printed on each panel.
List of Printed Panels - This list identifies those panels that are printed, but not necessarily revised. Partial revisions are common and the inside of the index will show the suffix of each panel to determine what has been revised. New county wide indexes will have effective dates printed on each panel.
MAP INDEX
PANELS PRINTED: 14, 126, 127
129, 136, 137, 138, 139, 150, 168,
175, 200, 237, 239, 250, 275, 300
377, 400, 417, 418, 419, 425, 525
575
MAP NUMBER
16015C0000
EFFECTIVE DATE:
FEBRUARY 19, 1992
Federal Emergency Management Agency
Done
Internet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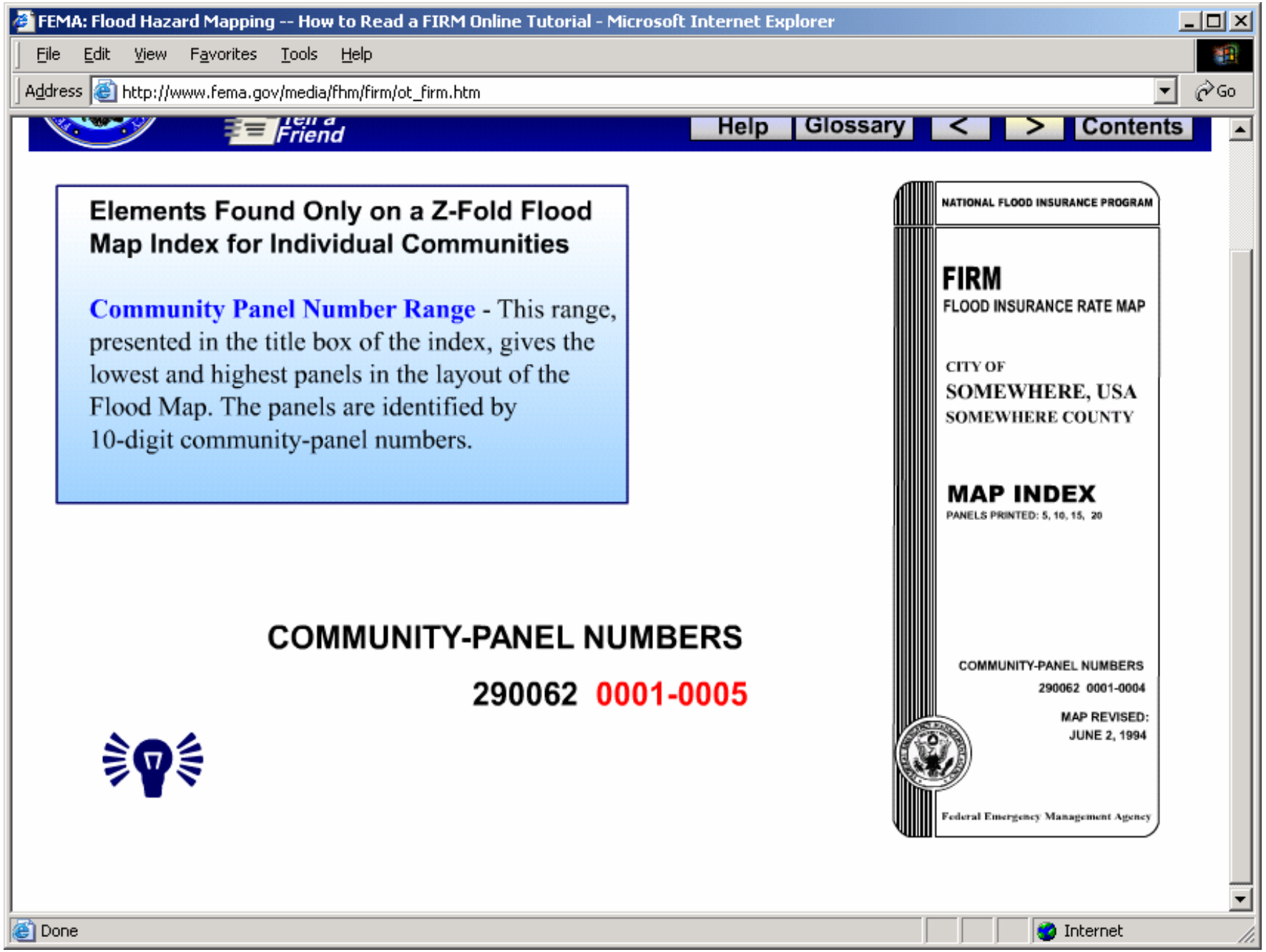
Elements Found Only on a Countywide Flood Map Index
List of Floodprone Communities:
* Floodprone communities covered by the Flood Map. (Note: All communities are listed; the non-floodprone communities are footnoted to indicate they are non-floodprone.)
* The community identification number for each community
* The panel on which each community is shown
* The initial flood identification date (the date that flood hazards were first identified)
* Post FIRM date for each community (the date of the first FEMA Flood Map for the community)
FLOOD-PRONE COMMUNITIES
COMMUNITY NAME
COMMUNITY NUMBER
LOCATED PANELS
INITIAL IDENT. DATE
POST-FIRM DATE
ARLINGTON, CITY OF 485454 0317,0318,0319,0330,0335,0336,0337,0338,0339,0341,0343,0427, 0429,0430,0431,0432,0433,0434,0437,0439,0440,0441 0442,0443,0444,0451,0452,0453,0454,0456,0458,0461 August 7, 1970 December 31, 1974
AZLE, CITY OF 480584 0110,0116,0117,0118,0119,0232,0235 March 8, 1974 October 15 1985
BEDFORD, CITY OF 480585 0306,0307,0308,0309,0330 December 28, 1973 July 18, 1977
BENBROOK, CITY OF 480586 0370,0380,0385,0390,0395 May 3, 1974 July 2, 1979
Done
Internet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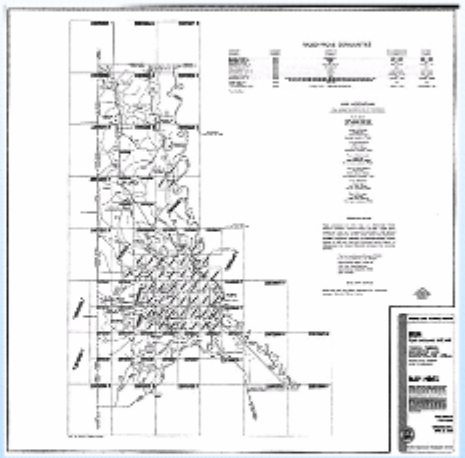
Elements Found Only on a Z-Fold Flood Map Index for Individual Communities
Community Panel Number Range - This range, presented in the title box of the index, gives the lowest and highest panels in the layout of the Flood Map. The panels are identified by 10-digit community-panel numbers.
COMMUNITY-PANEL NUMBERS
290062 0001-0005
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF
SOMEWHERE, USA
SOMEWHERE COUNTY
MAP INDEX
PANELS PRINTED: 5, 10, 15, 20
COMMUNITY-PANEL NUMBERS
290062 0001-0004
MAP REVISED:
JUNE 2, 1994
Federal Emergency Management Agency
Done
Internet

Elements Found on Some Z-Fold Flood Map Indexes

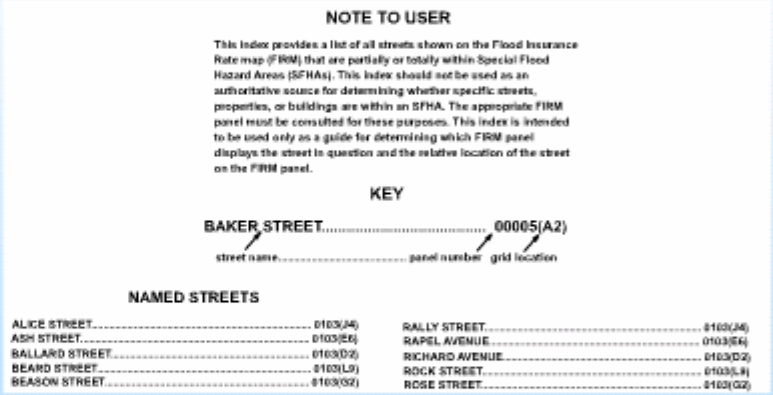
- Floodprone Area Overview
- Floodprone Street Index
- Map Repository Address



- **Floodprone Area Overview:**
  Floodprone area overviews are shown on some Flood Maps. These areas on the map provide a generalized depiction of the Special Flood Hazard Areas shown on each panel. It helps you find the appropriate panel and orients you to the Flood Map. It should not be used in place of the more detailed delineations on the panels.

Elements Found on Some Z-Fold Flood Map Indexes

- Floodprone Area Overview
- Floodprone Street Index
- Map Repository Address



NOTE TO USER

This index provides a list of all streets shown on the Flood Insurance Rate map (FIRM) that are partially or totally within Special Flood Hazard Areas (SFHAs). This index should not be used as an authoritative source for determining whether specific streets, properties, or buildings are within an SFHA. The appropriate FIRM panel must be consulted for these purposes. This index is intended to be used only as a guide for determining which FIRM panel displays the street in question and the relative location of the street on the FIRM panel.

KEY

BAKER STREET ..... 00005(A2)

street name ..... panel number grid location

NAMED STREETS

ALICE STREET	0103(J4)	RALLY STREET	0103(J4)
ASH STREET	0103(E6)	RAPEL AVENUE	0103(E4)
BALLARD STREET	0103(D2)	RICHARD AVENUE	0103(D2)
BEARD STREET	0103(L9)	ROCK STREET	0103(L9)
BEASON STREET	0103(G2)	ROSE STREET	0103(G2)

- **Floodprone Street Index**

  Shown on selected Flood Maps, this index lists the streets in the mapped community that are partially or completely in the Special Flood Hazard Area. It also indicates the panel(s) on which each street is shown. Grid coordinates that allow you to locate the street on the panel are listed for each street. The floodprone street index may be shown either on the index or on a separate panel.

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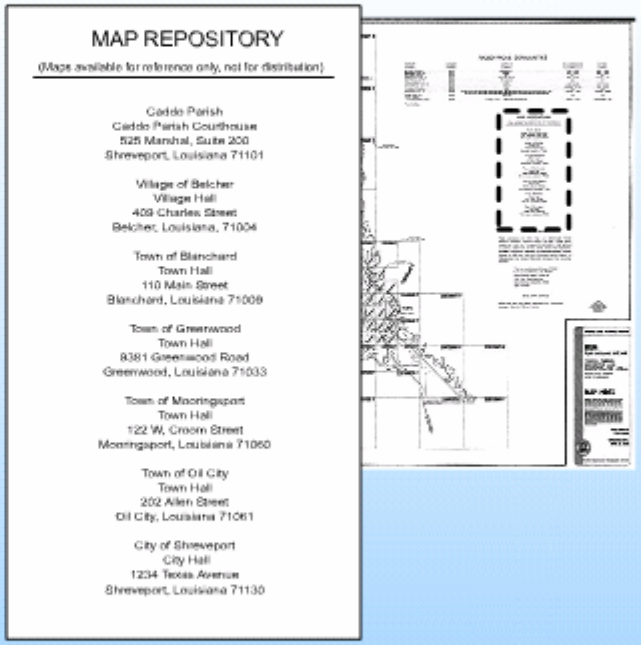
Elements Found on Some Z-Fold Flood Map Indexes

- Floodprone Area Overview
- Floodprone Street Index
- Map Repository Address



MAP REPOSITORY

(Maps available for reference only, not for distribution)

Caddo Parish
Caddo Parish Courthouse
525 Marshal, Suite 200
Shreveport, Louisiana 71101

Village of Belcher
Village Hall
409 Charles Street
Belcher, Louisiana, 71004

Town of Blanchard
Town Hall
110 Main Street
Blanchard, Louisiana 71009

Town of Greenwood
Town Hall
8381 Greenwood Road
Greenwood, Louisiana 71033

Town of Mooringsport
Town Hall
122 W. Croom Street
Mooringsport, Louisiana 71060

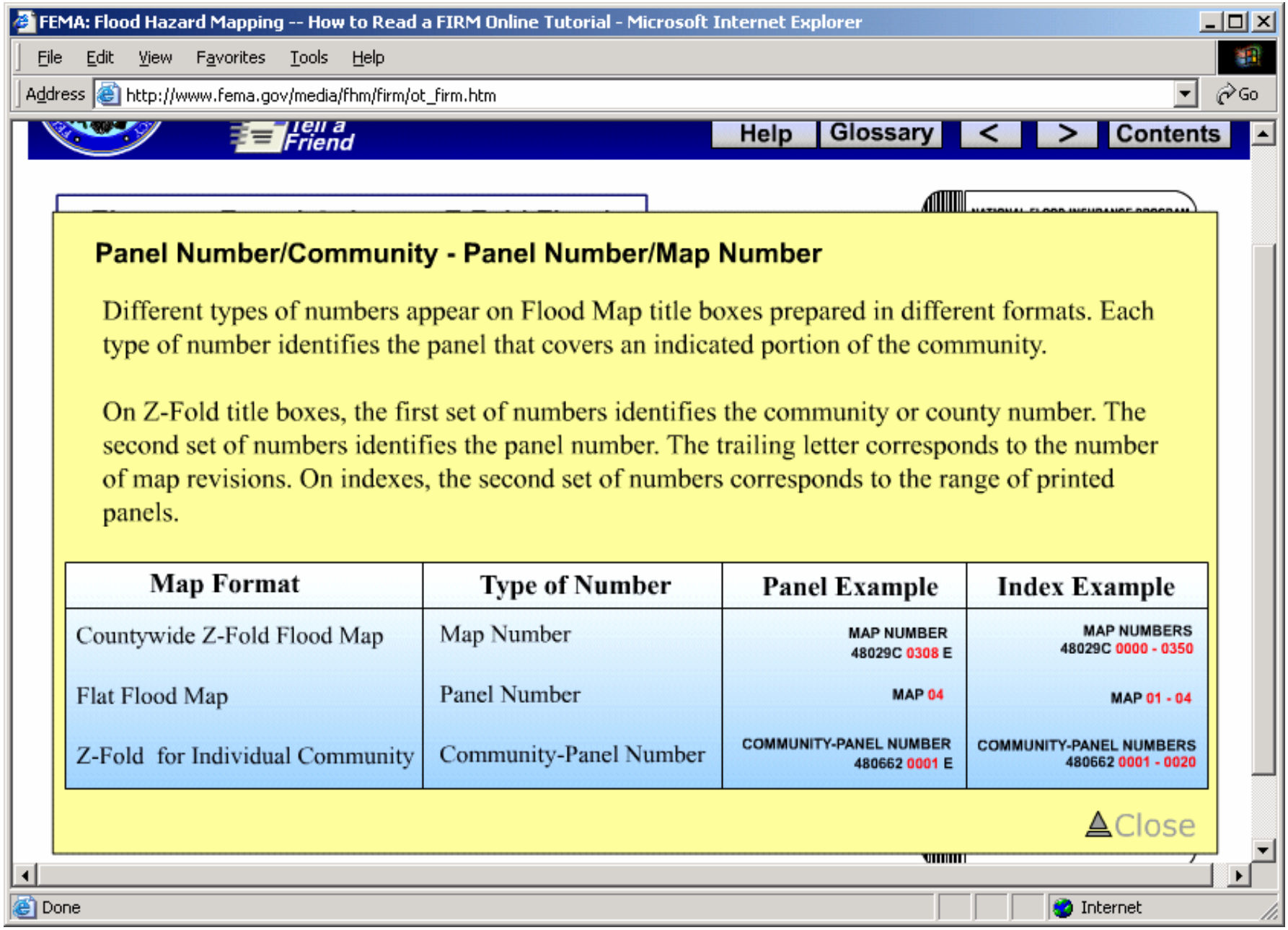
Town of Oil City
Town Hall
202 Allen Street
Oil City, Louisiana 71061

City of Shreveport
City Hall
1234 Texas Avenue
Shreveport, Louisiana 71130

- **Map Repository Address**

  This is the address of the official community office where reference copies of the Flood Map and Flood Insurance Study report are stored and made available.

Done Internet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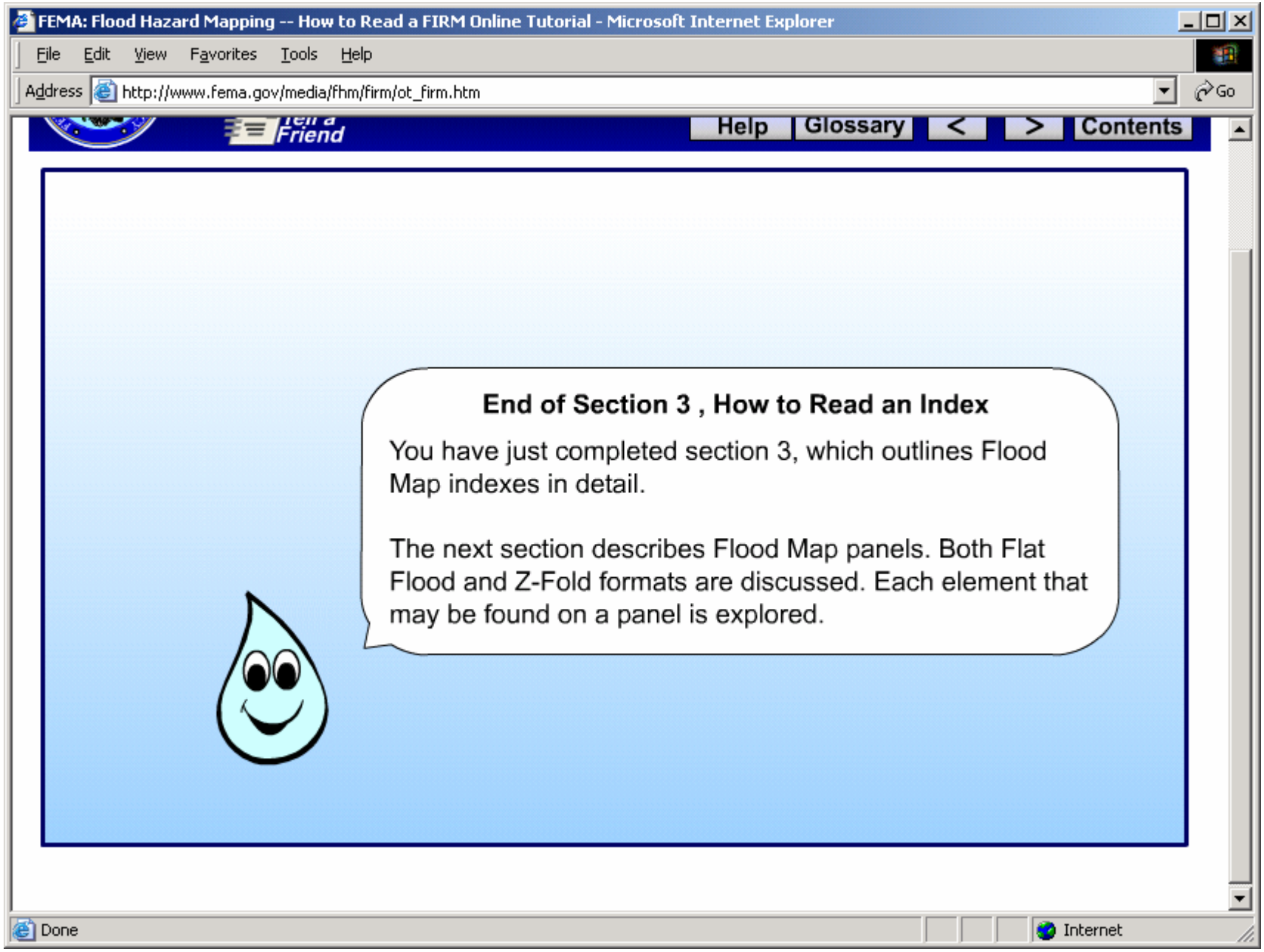
Contents
Panel Number/Community - Panel Number/Map Number
Different types of numbers appear on Flood Map title boxes prepared in different formats. Each type of number identifies the panel that covers an indicated portion of the community.
On Z-Fold title boxes, the first set of numbers identifies the community or county number. The second set of numbers identifies the panel number. The trailing letter corresponds to the number of map revisions. On indexes, the second set of numbers corresponds to the range of printed panels.
Map Format
Type of Number
Panel Example
Index Example
Countywide Z-Fold Flood Map
Map Number
MAP NUMBER
48029C 0308 E
MAP NUMBERS
48029C 0000 - 0350
Flat Flood Map
Panel Number
MAP 04
MAP 01 - 04
Z-Fold for Individual Community
Community-Panel Number
COMMUNITY-PANEL NUMBER
480662 0001 E
COMMUNITY-PANEL NUMBERS
480662 0001 - 0020
Close
Done
Internet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Contents
End of Section 3 , How to Read an Index
You have just completed section 3, which outlines Flood Map indexes in detail.
The next section describes Flood Map panels. Both Flat Flood and Z-Fold formats are discussed. Each element that may be found on a panel is explored.
Done
Internet

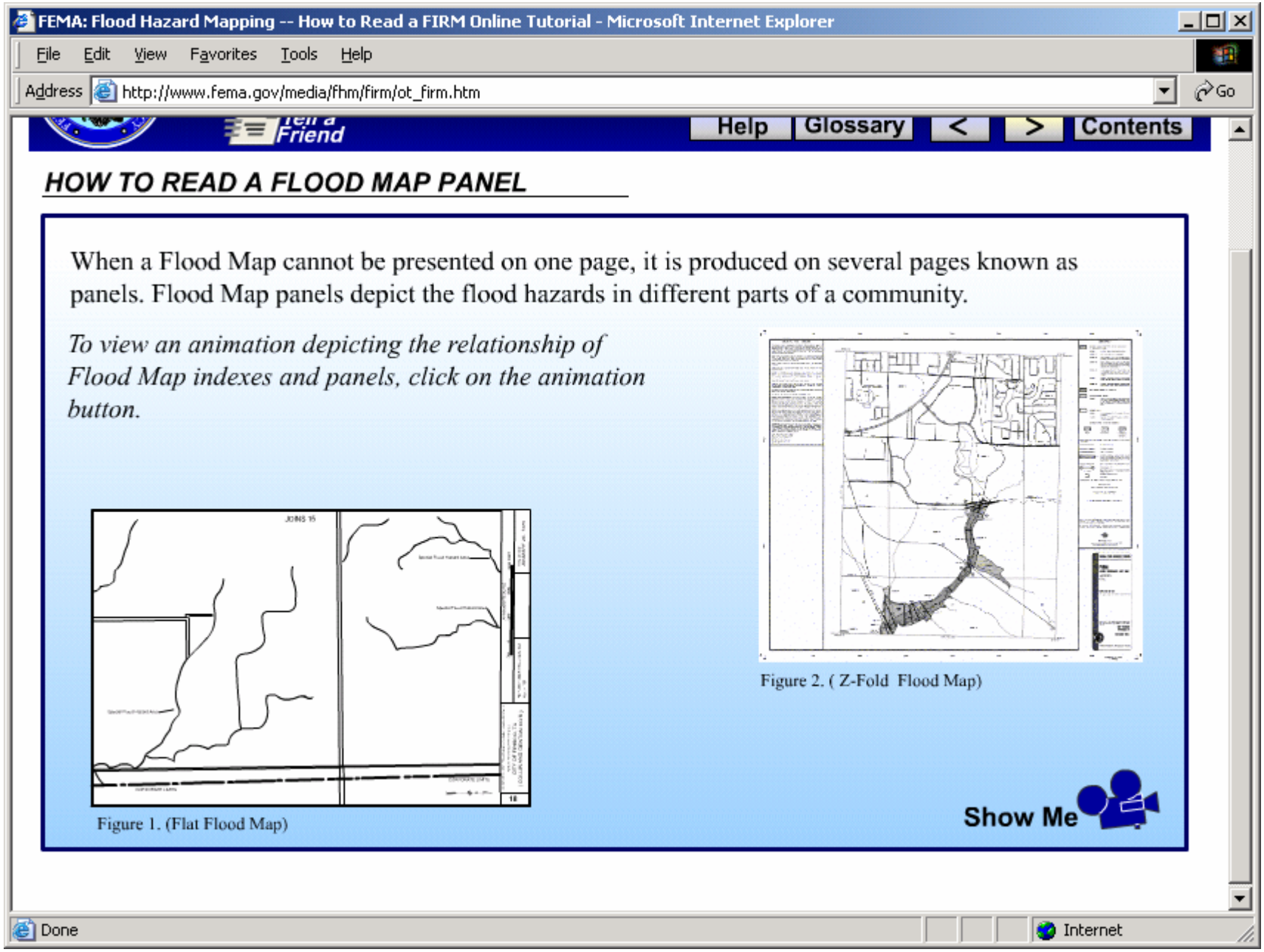
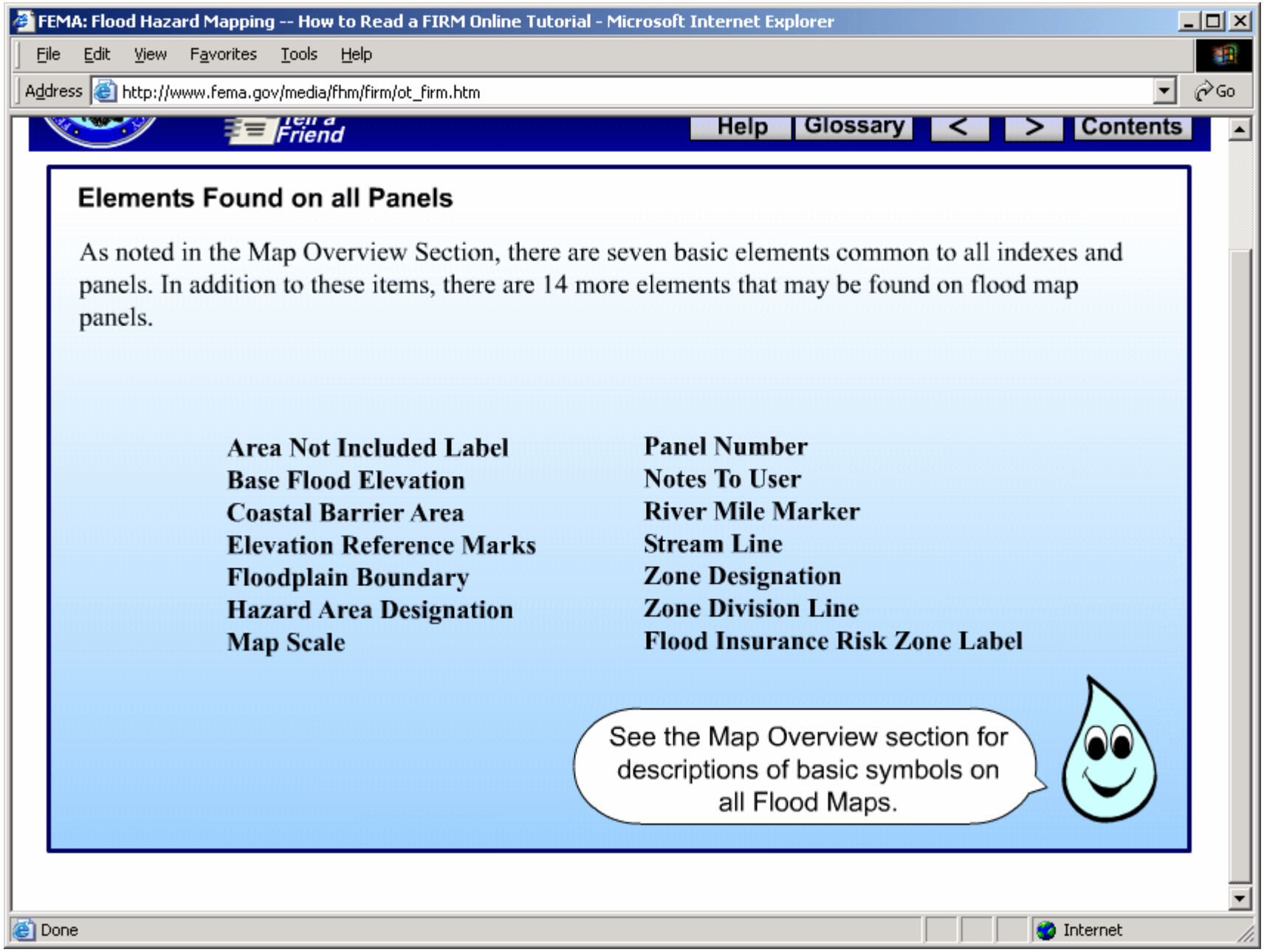


Illustration shown on Page _____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Contents
Elements Found on all Panels
As noted in the Map Overview Section, there are seven basic elements common to all indexes and panels. In addition to these items, there are 14 more elements that may be found on flood map panels.
Area Not Included Label
Base Flood Elevation
Coastal Barrier Area
Elevation Reference Marks
Floodplain Boundary
Hazard Area Designation
Map Scale
Panel Number
Notes To User
River Mile Marker
Stream Line
Zone Designation
Zone Division Line
Flood Insurance Risk Zone Label
See the Map Overview section for descriptions of basic symbols on all Flood Maps.
Done
Internet

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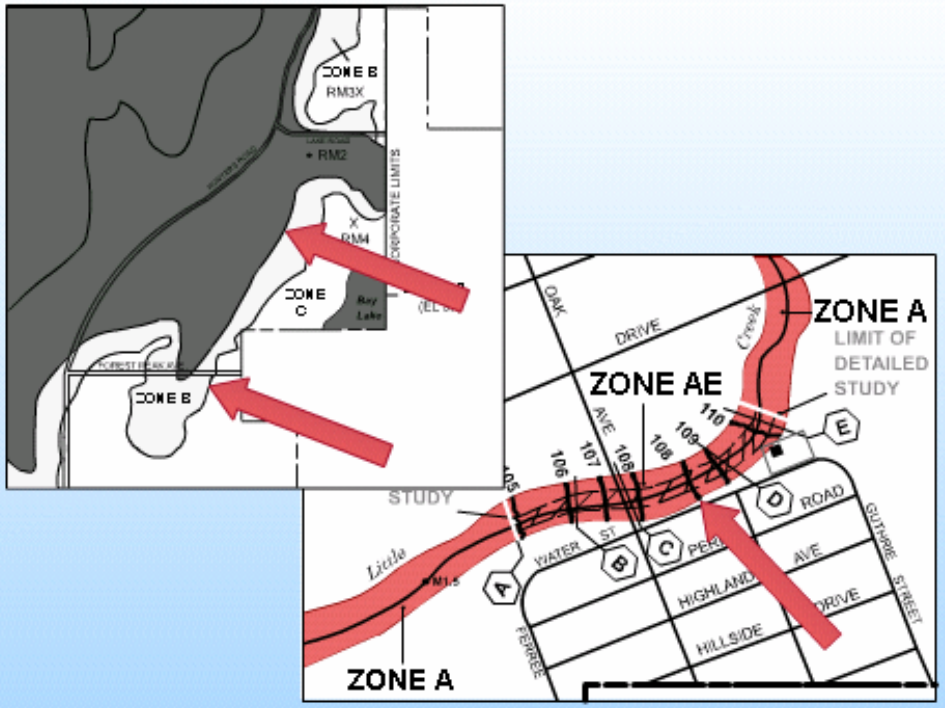
Elements Found on all Panels

- *Floodplain Boundary*
- Hazard Area Designation
- Base Flood Elevation
- Zone Division Line

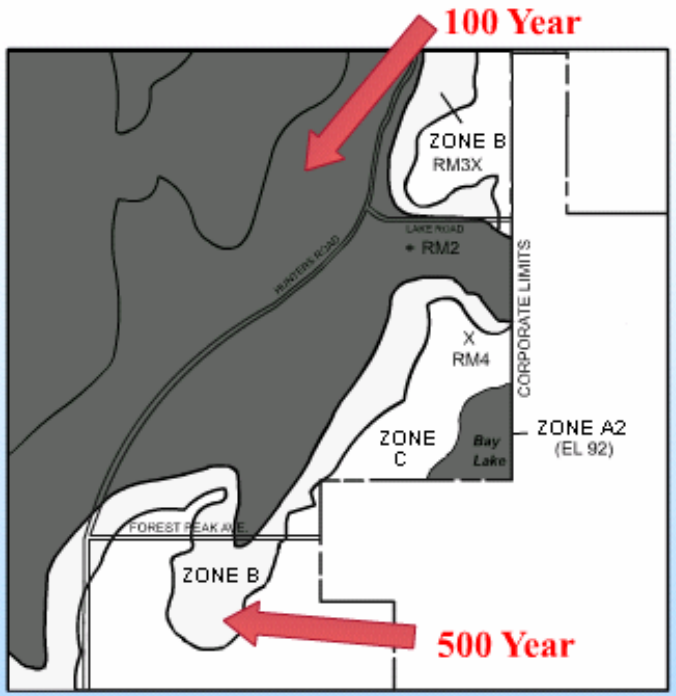


Floodplain Boundary:
These boundaries show the 100-yr and 500-yr Floodplains.

Done Internet

Elements Found on all Panels

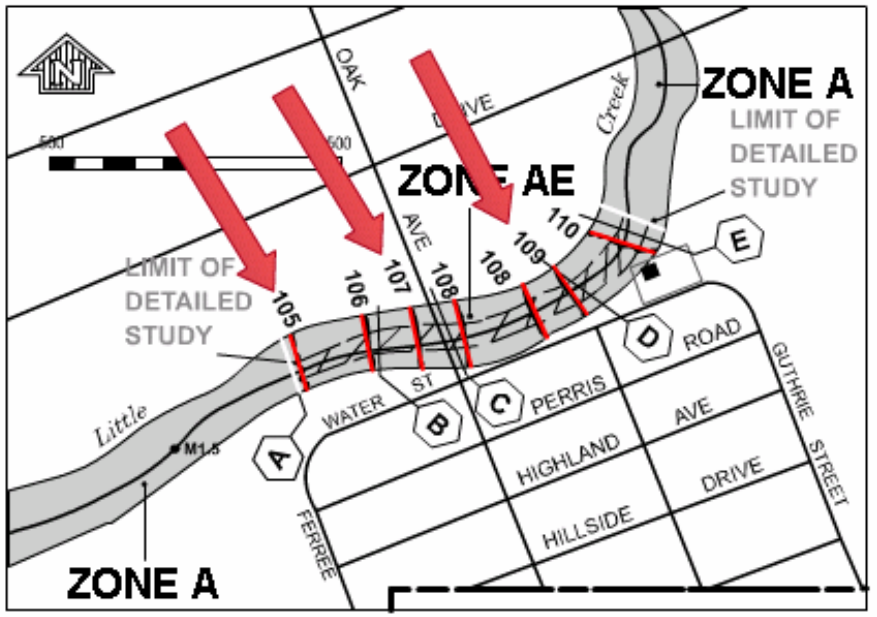
- Floodplain Boundary
- *Hazard Area Designation*
- Base Flood Elevation
- Zone Division Line



- **Hazard Area Designation:**
  These areas appear as dark and light tints. Dark tints indicate areas of greater flood hazard; light indicates areas of lesser flood hazard.

Elements Found on all Panels

- Floodplain Boundary
- Hazard Area Designation
- *Base Flood Elevation*
- Zone Division Line



Base Flood Elevation: - **(BFE)** For detailed study areas this line and label indicates the water surface elevation of the base flood in relation to a standard set of geographic data in Special Flood Hazard Areas. A wavy line is used to indicate when the base flood elevation varies along a watercourse. When the base flood elevation is uniform across a large area, a label is used.

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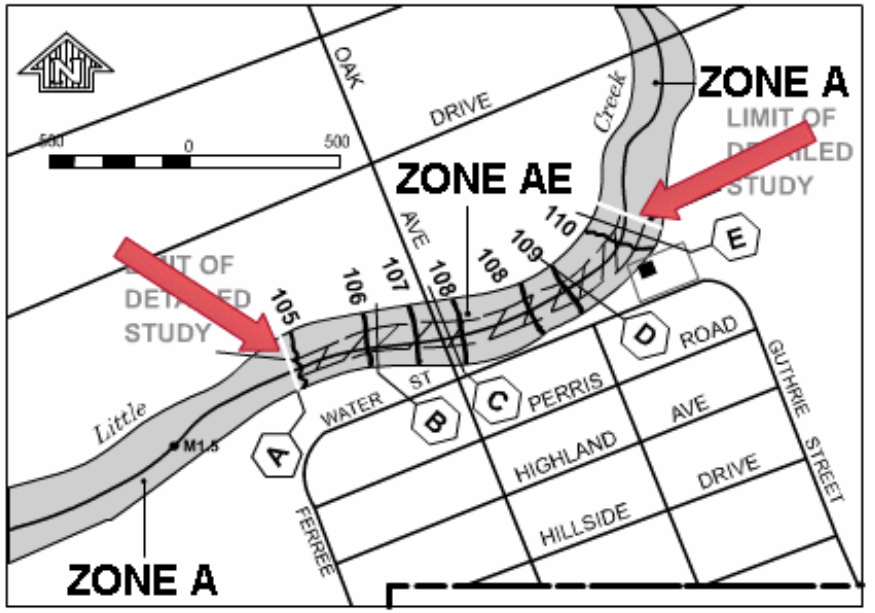
Elements Found on all Panels

- Floodplain Boundary
- Hazard Area Designation
- Base Flood Elevation
- *Zone Division Line*

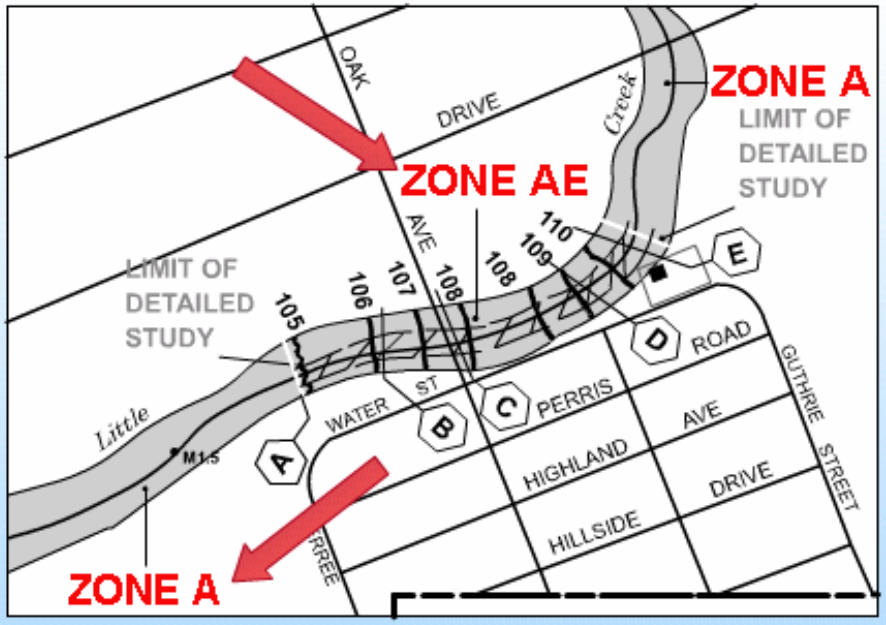


Zone Division Line: - This line separates Special Flood Hazard Areas with different zone designations and separates Special Flood Hazard Areas with differing Base Flood Elevations in hazard areas.

Done Internet

Elements Found on all Panels, (Continued)

- *Flood Insurance Risk Zone Designation*
- River Mile Marker
- Stream Line
- Coastal Barrier



Flood Insurance Risk Zone Designations:
The zone designations indicate the magnitude of the flood hazard in specific areas of a community.

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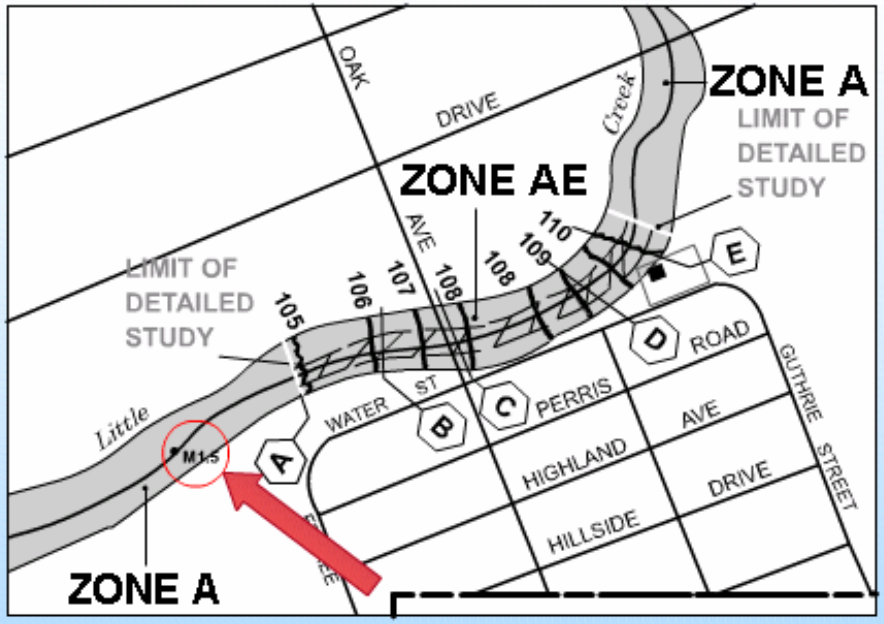
Elements Found on all Panels, (Continued)

- Flood Insurance Risk Zone Designation
- *River Mile Marker*
- Stream Line
- Coastal Barrier

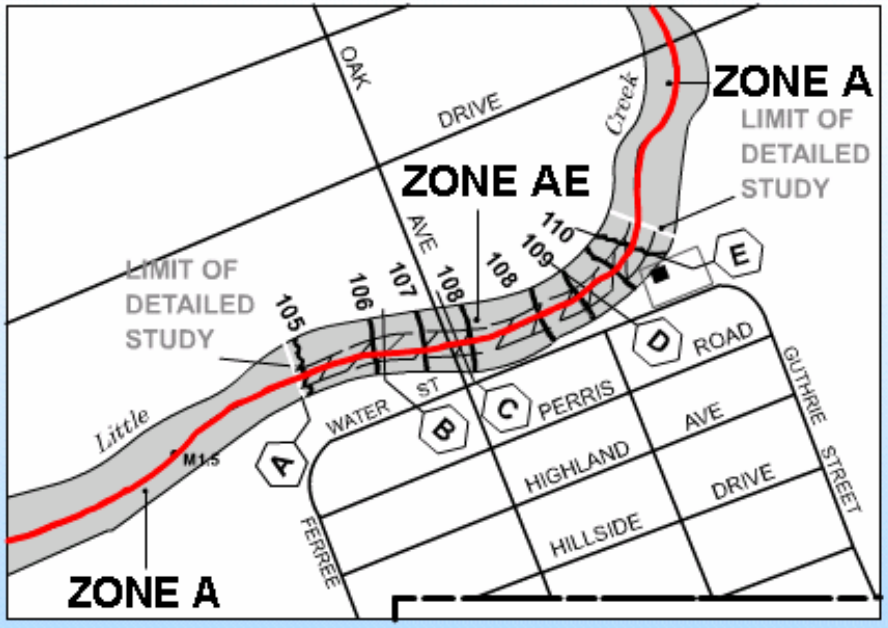


River Mile Marker:
This marker identifies the distance in miles from a reference point on a river or other major watercourse.

Done Internet

Elements Found on all Panels, (Continued)

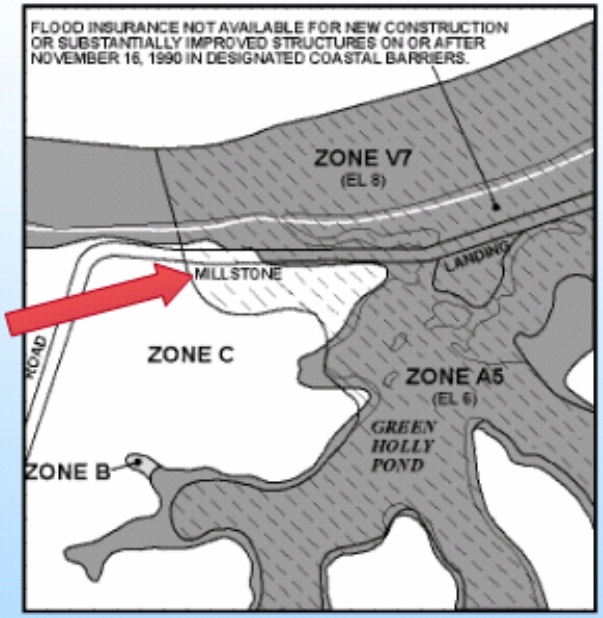
- Flood Insurance Risk Zone Designation
- River Mile Marker
- *Stream Line*
- Coastal Barrier



Stream Line: - This line identifies the location of a watercourse. Narrower streams are usually shown by a a single line, representing the approximate location of the stream centerline. Wider streams are often shown by double lines, representing stream bank locations.

Elements Found on all Panels, (Continued)

- **Flood Insurance Risk Zone Designation**
- **River Mile Marker**
- **Stream Line**
- ***Coastal Barrier***



Coastal Barrier Symbol: - Coastal barrier symbols appear only on Flood Maps that contain coastal communities. These symbols identify undeveloped coastal barriers in the Coastal Barrier Resources System (CBRS). No new flood insurance coverage may be provided after specified dates for new or substantially improved structures on any Coastal Flood Hazard Area in the System.

Elements Found on all Panels, Continued

- *Area Not Included*
- Map Scale
- Panel Number
- Notes To User
- Elevation Reference Marks

Area Not Included Label:
This label identifies areas that are in the panel area, but are not in the jurisdiction of that community; thus, no flood hazard information is shown in that area.

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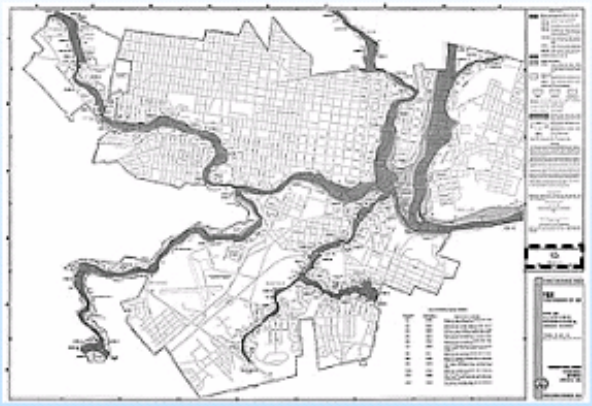
Elements Found on all Panels, Continued

- Area Not Included
- *Map Scale*
- Panel Number
- Notes To User
- Elevation Reference Marks



Map Scale: - This allows you to relate distances measured on the Flood Map to actual distances on the ground. The scale shown on a panel applies only to that panel. Most commonly used scales are one inch on the map equals 500, 1000, or 2000 feet on the ground.

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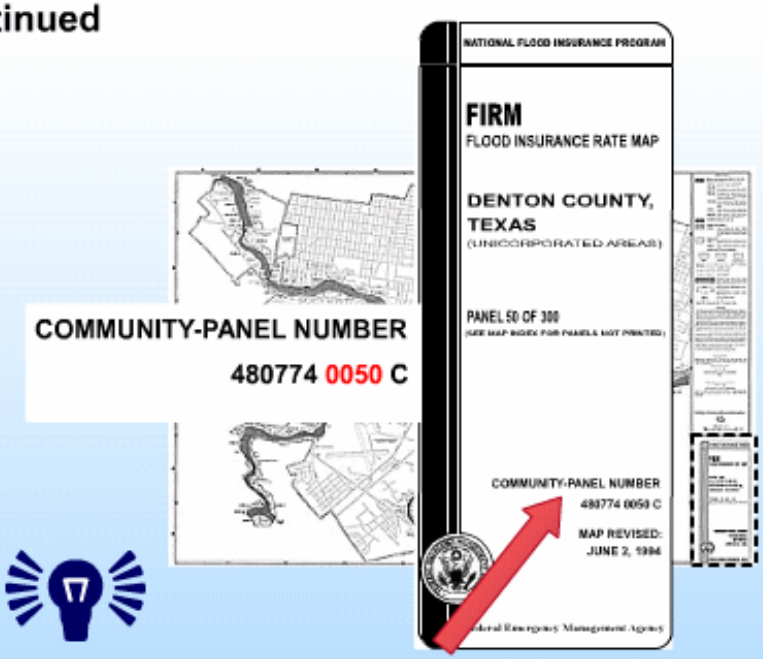
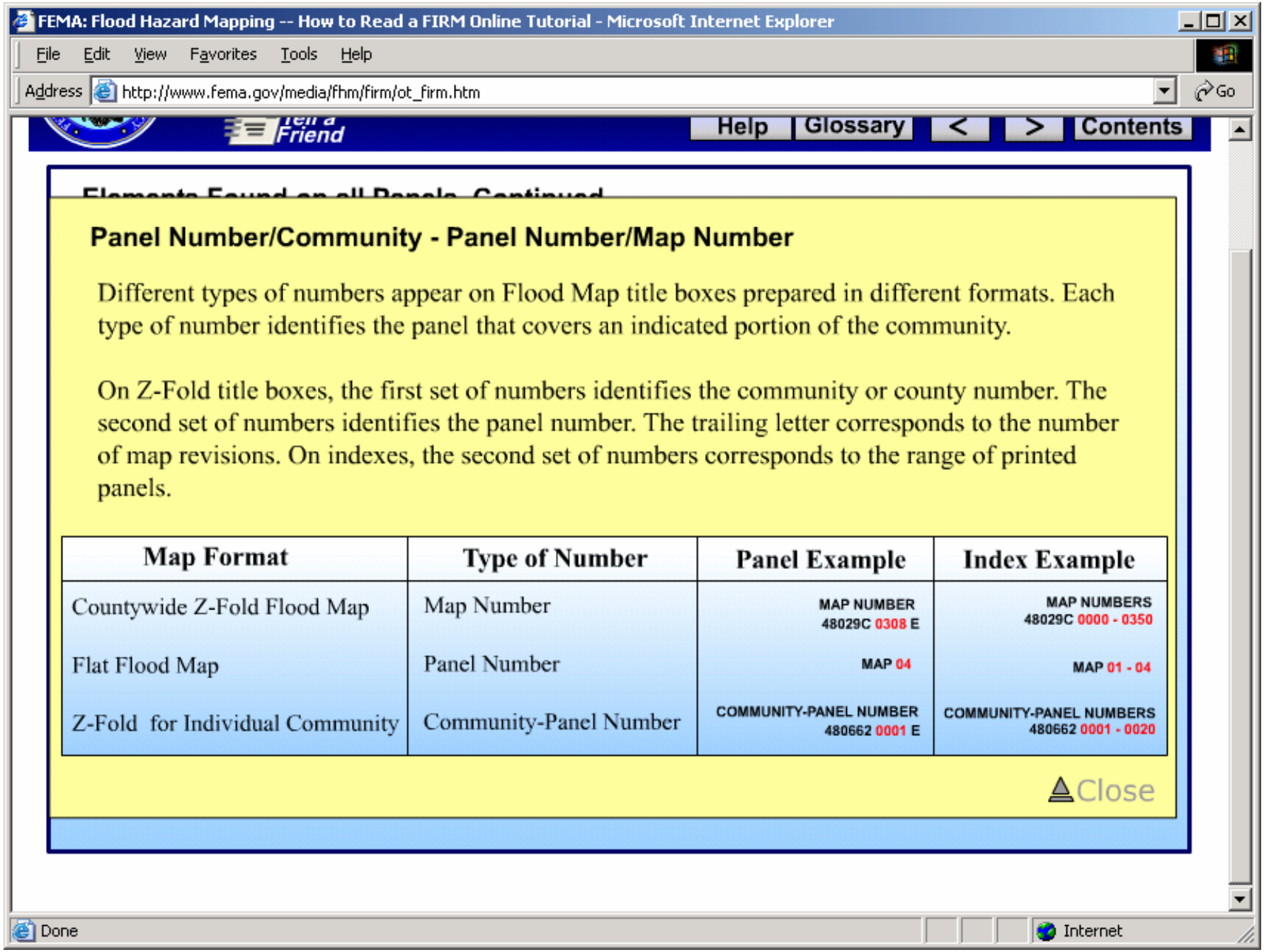
Elements Found on all Panels, Continued

- Area Not Included
- Map Scale
- *Panel Number*
- Notes To User
- Elevation Reference Marks



Panel Number: - This number distinguishes each panel from others in the same community, each page is given a unique panel number. On Flat Flood Maps the panel number is a two digit number. On Z-Folds, the panel number matches the last four digits of the community panel number. On Countywide Z-Folds, the panel number matches the last four digits of the map number.

Done Internet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Elements Found on all Panels Continued
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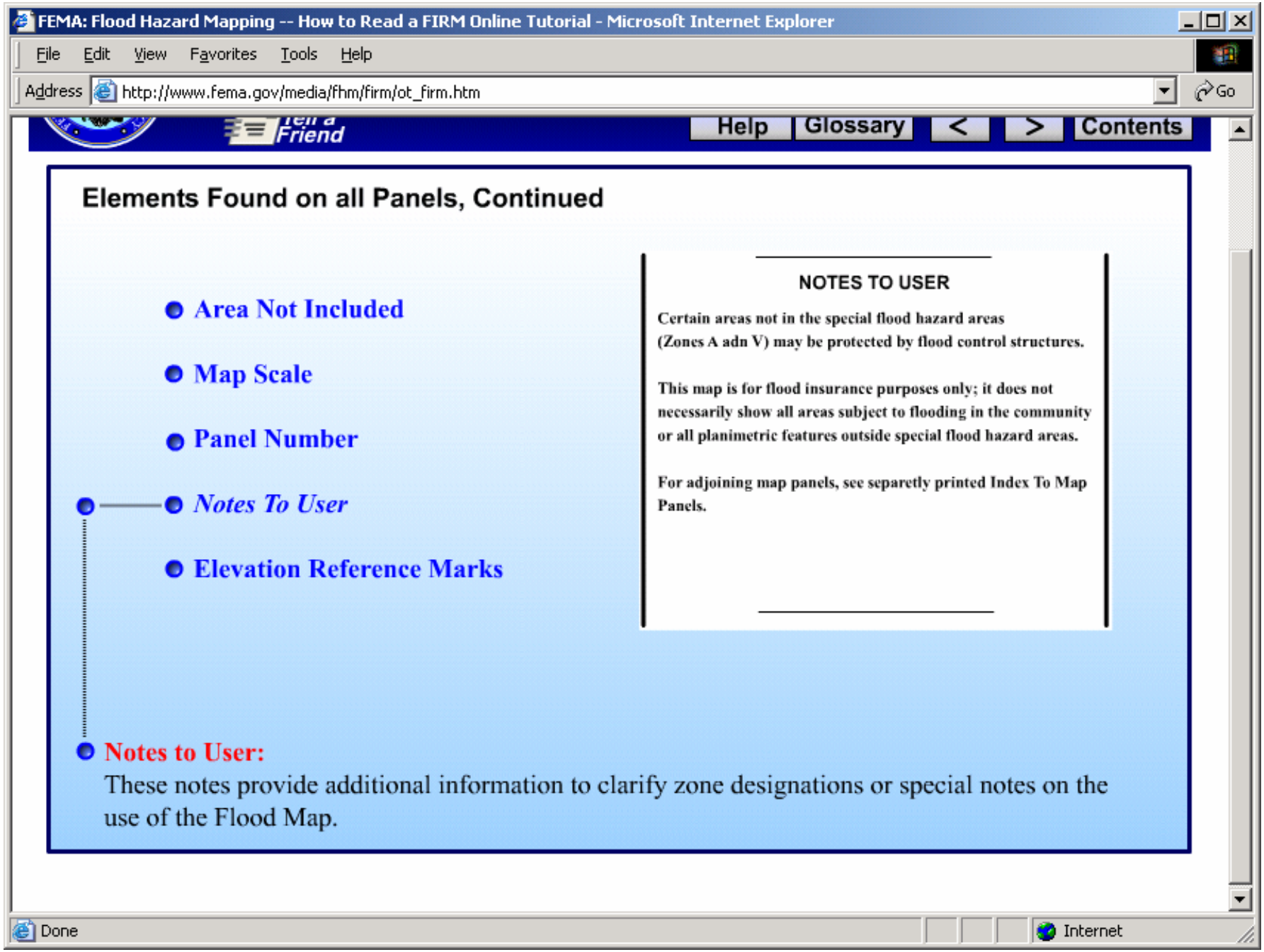
Map Format
Type of Number
Panel Example
Index Example
Countywide Z-Fold Flood Map
Map Number
MAP NUMBER 48029C 0308 E
MAP NUMBERS 48029C 0000 - 0350
Flat Flood Map
Panel Number
MAP 04
MAP 01 - 04
Z-Fold for Individual Community
Community-Panel Number
COMMUNITY-PANEL NUMBER 480662 0001 E
COMMUNITY-PANEL NUMBERS 480662 0001 - 0020
Close
Done
Internet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Elements Found on all Panels, Continued
Area Not Included
Map Scale
Panel Number
Notes To User
Elevation Reference Marks
NOTES TO USER
Certain areas not in the special flood hazard areas (Zones A adn V) may be protected by flood control structures.
This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.
For adjoining map panels, see separetly printed Index To Map Panels.
Notes to User:
These notes provide additional information to clarify zone designations or special notes on the use of the Flood Map.
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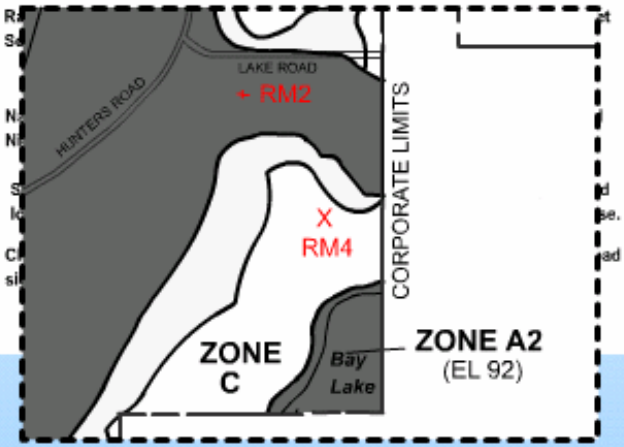
Elements Found on all Panels, Continued

- Area Not Included
- Map Scale
- Panel Number
- Notes To User
- *Elevation Reference Marks*

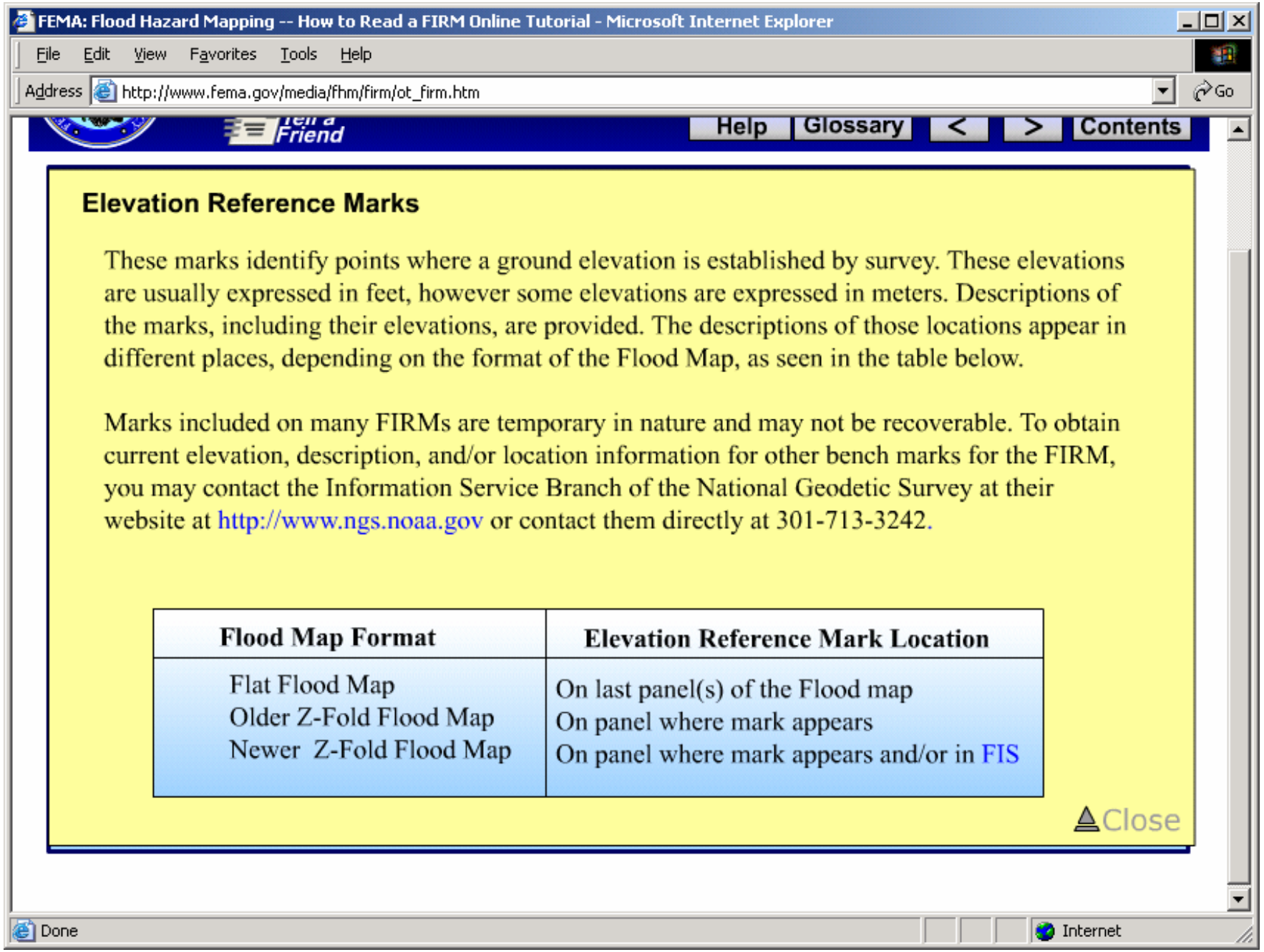
ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT.NVGD)	DESCRIPTION OF LOCATION
RM 1	598.46	Standard USGS bronze disk set on top of concrete horizon web midway between concrete piles of main bent at rightlow water bank o f old U.S. Hwy bridge over Clear Creek
RM 2	642.84	
RM 4	636.44	
RM 5	624.32	
RM 6	593.85	



Elevation Reference Marks: - (ERMs) These marks identify points where a ground elevation is established by survey. Descriptions of reference marks appear on different places, depending on the map format.

Done Internet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Elevation Reference Marks
These marks identify points where a ground elevation is established by survey. These elevations are usually expressed in feet, however some elevations are expressed in meters. Descriptions of the marks, including their elevations, are provided. The descriptions of those locations appear in different places, depending on the format of the Flood Map, as seen in the table below.
Marks included on many FIRMs are temporary in nature and may not be recoverable. To obtain current elevation, description, and/or location information for other bench marks for the FIRM, you may contact the Information Service Branch of the National Geodetic Survey at their website at http://www.ngs.noaa.gov or contact them directly at 301-713-3242.
Flood Map Format
Elevation Reference Mark Location
Flat Flood Map
On last panel(s) of the Flood map
Older Z-Fold Flood Map
On panel where mark appears
Newer Z-Fold Flood Map
On panel where mark appears and/or in FIS
Close
Done
Internet

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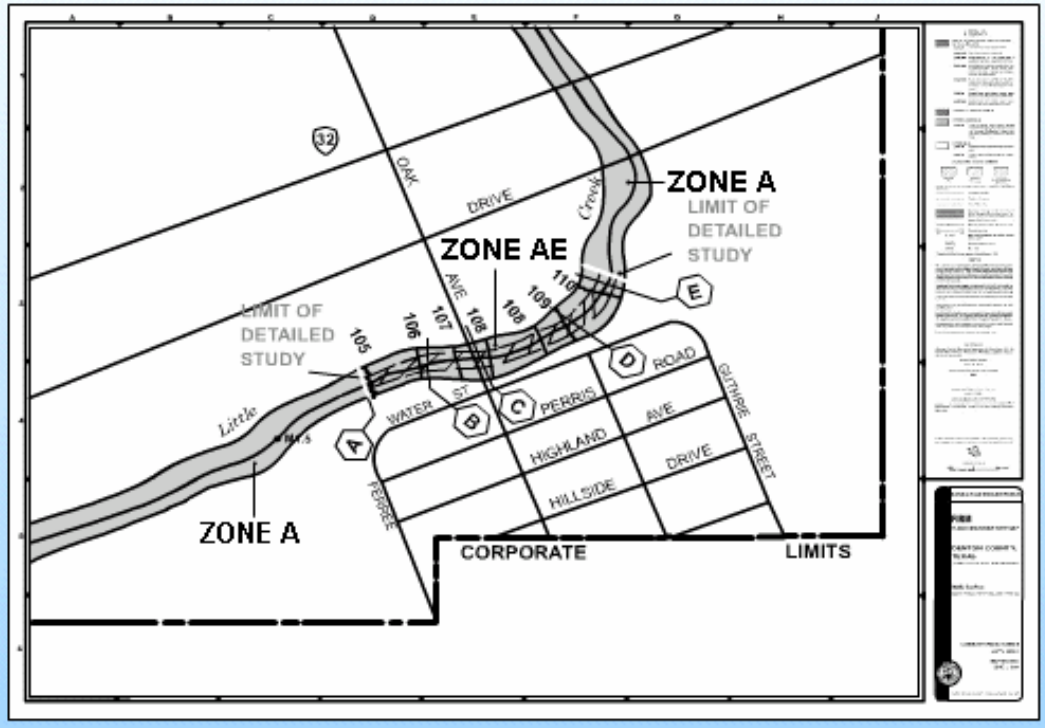
Elements Found Only on Some Z-Fold Panels



* Alpha-numeric Grid
* Cross Section Symbol
* Floodway Boundaries
* Floodway Designation
* Map Repository Address
* Panel Locator Diagram

Done Internet

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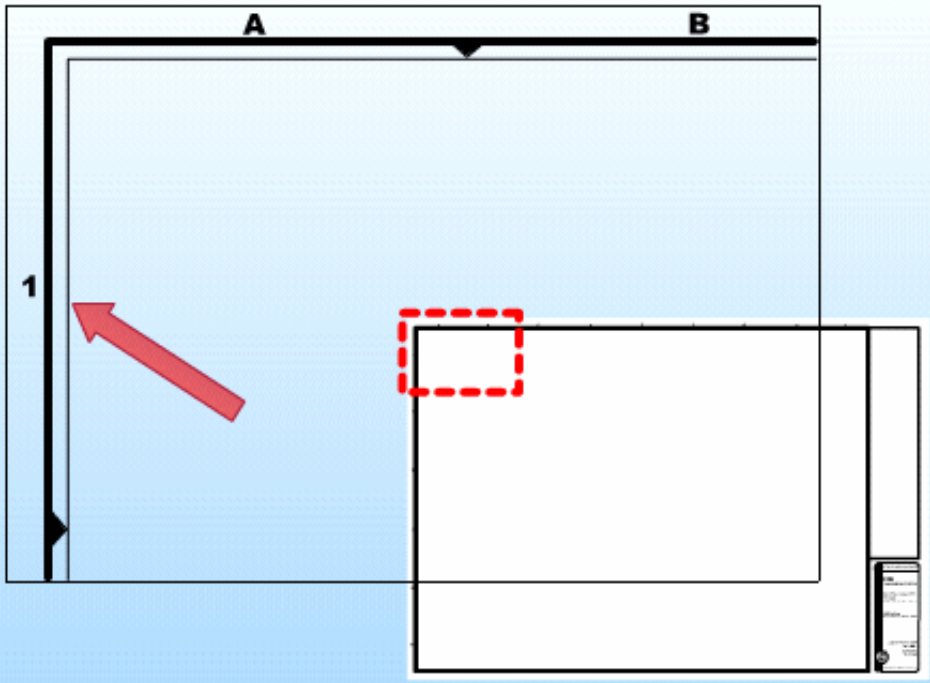
Elements Found Only on Some Z-Fold Panels

- *Alpha-numeric Grid*
- Cross Section Symbol
- Floodway Boundaries
- Floodway Designation
- Map Repository Address
- Panel Locator Diagram



Alpha-numeric Grid:
This is the basis of the coordinate systems established for the Floodprone Street Index.

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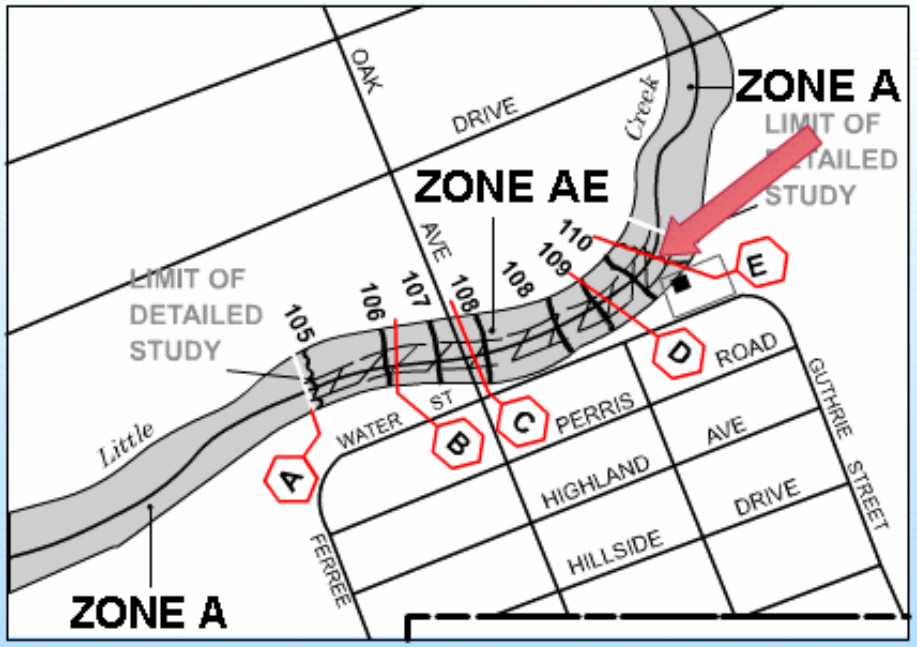
Elements Found Only on Some Z-Fold Panels

- Alpha-numeric Grid
- *Cross Section Symbol*
- Floodway Boundaries
- Floodway Designation
- Map Repository Address
- Panel Locator Diagram



Cross Section Symbol: - This symbol shows locations of floodplain cross sections used for computing detailed flood information. These locations can be correlated to the Flood Profiles referred to in the Flood Insurance Study.

Done Internet

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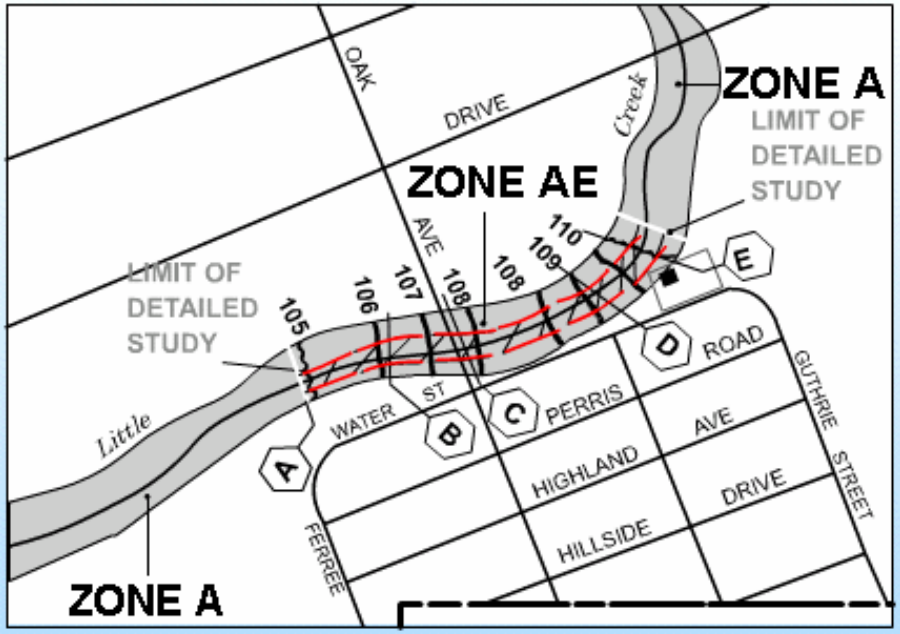
Elements Found Only on Some Z-Fold Panels

- *Alpha-numeric Grid*
- Cross Section Symbol
- *Floodway Boundaries*
- Floodway Designation
- Map Repository Address
- Panel Locator Diagram



Floodway Boundaries:
These boundaries show the limits of the floodway.

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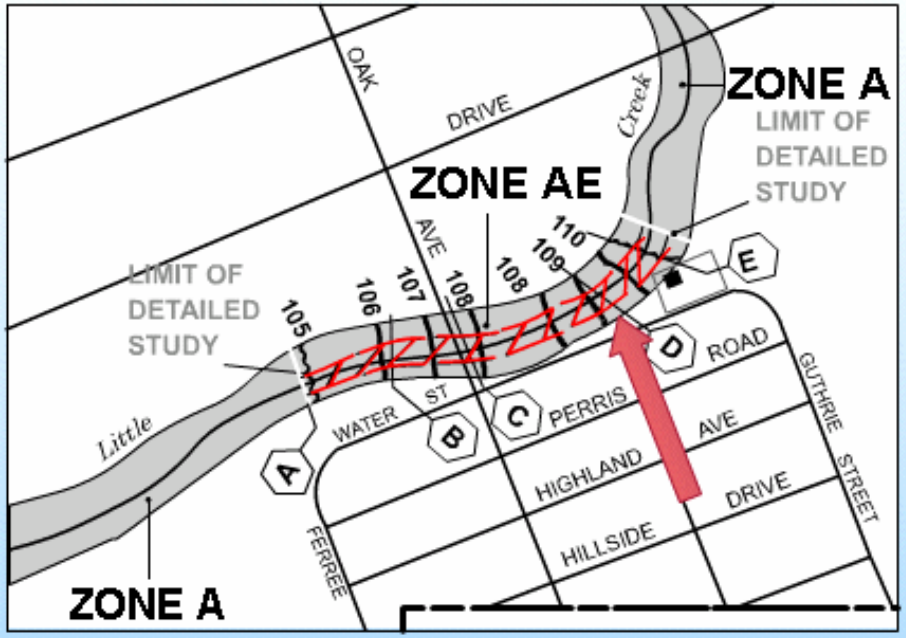
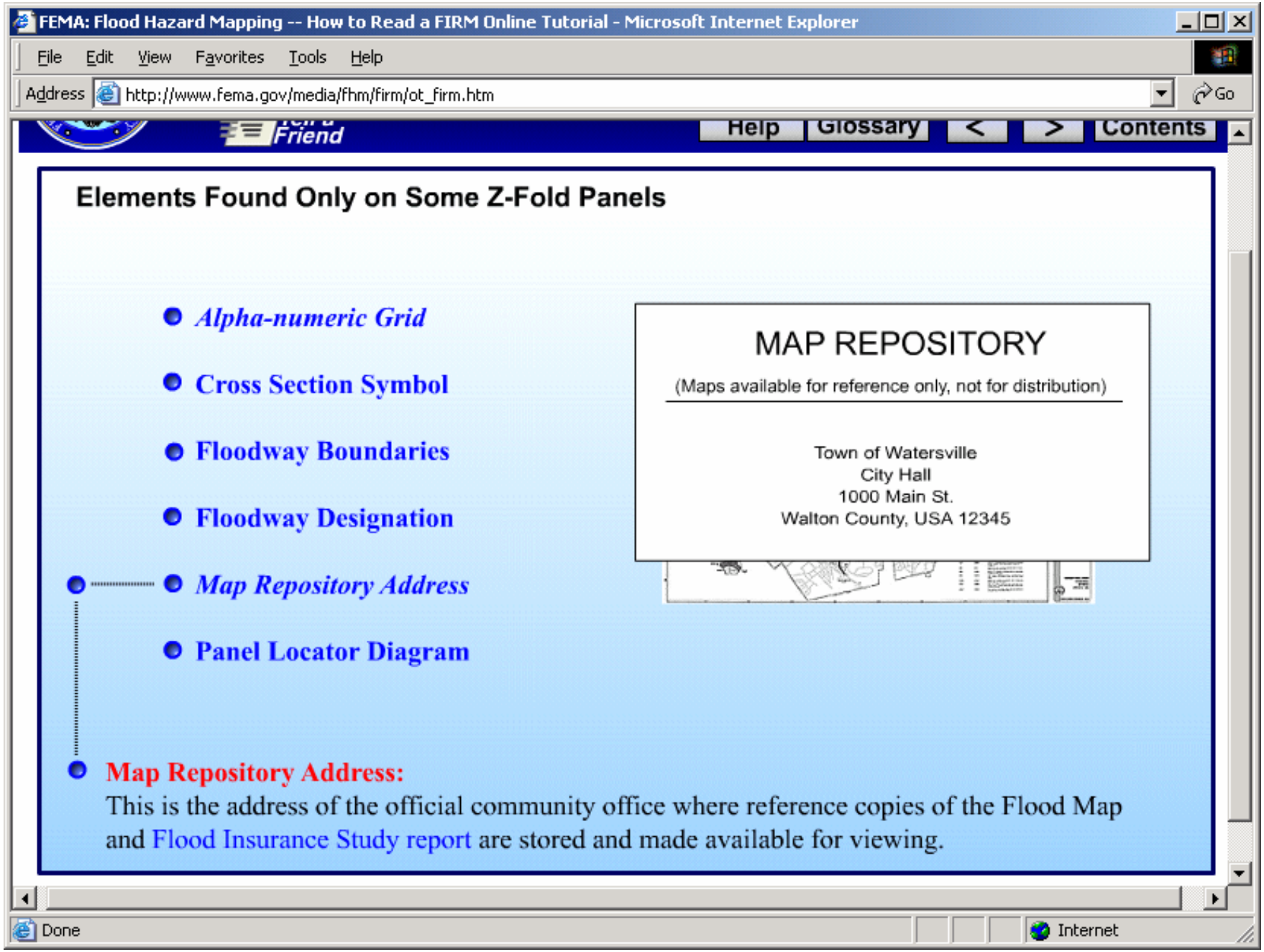
Elements Found Only on Some Z-Fold Panels

- *Alpha-numeric Grid*
- Cross Section Symbol
- Floodway Boundaries
- *Floodway Designation*
- Map Repository Address
- Panel Locator Diagram



Floodway Designation - This designation identifies floodway areas. The floodway is the channel of a river or other watercourse plus any adjacent floodplain areas that are reserved so that the 100-yr flood discharge can be conveyed without increasing the elevation of the 100-yr flood more than a specified amount.

Done Internet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Elements Found Only on Some Z-Fold Panels
Alpha-numeric Grid
Cross Section Symbol
Floodway Boundaries
Floodway Designation
Map Repository Address
Panel Locator Diagram
MAP REPOSITORY
(Maps available for reference only, not for distribution)
Town of Watersville
City Hall
1000 Main St.
Walton County, USA 12345
Map Repository Address:
This is the address of the official community office where reference copies of the Flood Map and Flood Insurance Study report are stored and made available for viewing.
Done
Internet

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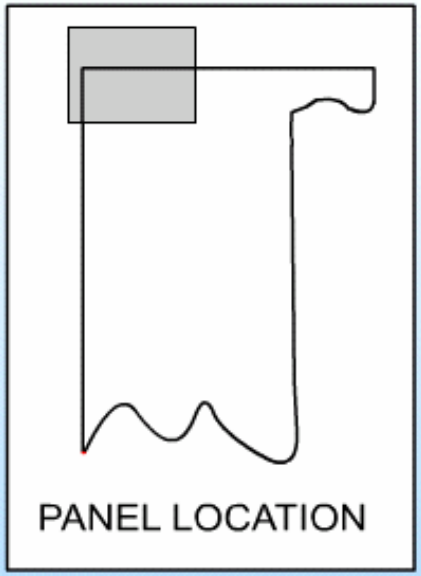
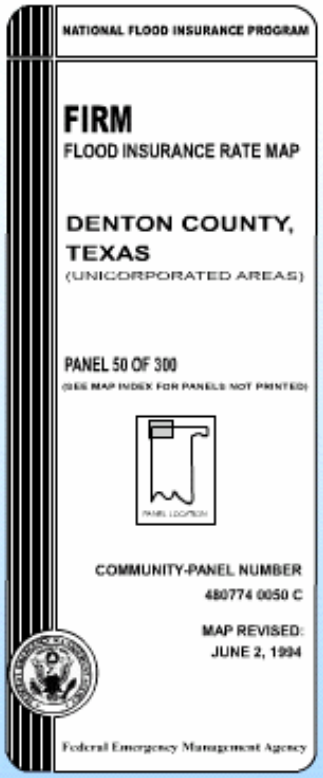
Elements Found Only on Some Z-Fold Panels

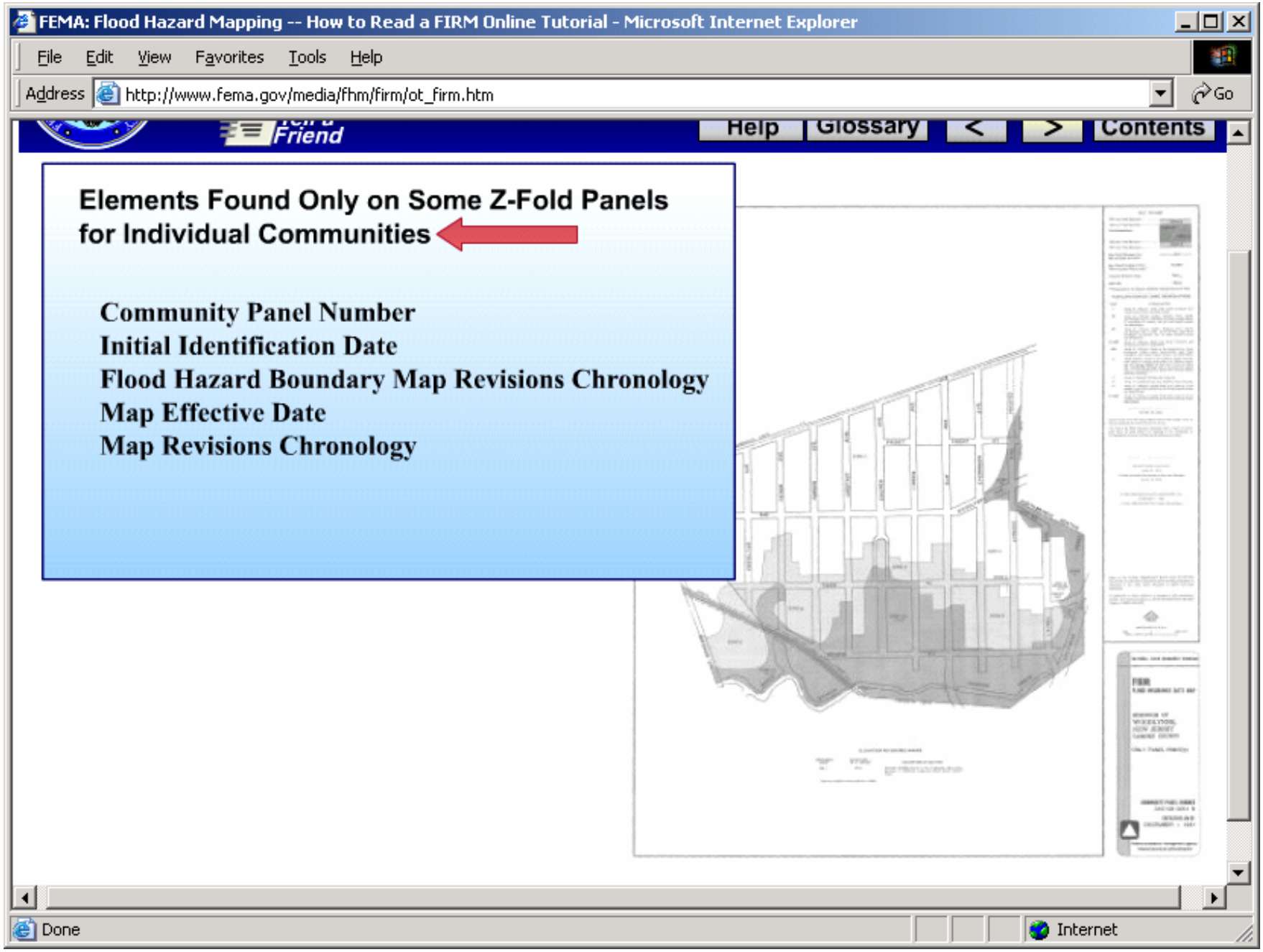
- *Alpha-numeric Grid*
- Cross Section Symbol
- Floodway Boundaries
- Floodway Designation
- Map Repository Address
- *Panel Locator Diagram*





Panel Locator Diagram:
This diagram shows the area covered by the panel in relation to the outline of the mapped community.

Done Internet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Help Glossary Contents
Elements Found Only on Some Z-Fold Panels for Individual Communities
Community Panel Number
Initial Identification Date
Flood Hazard Boundary Map Revisions Chronology
Map Effective Date
Map Revisions Chronology
Done
Internet

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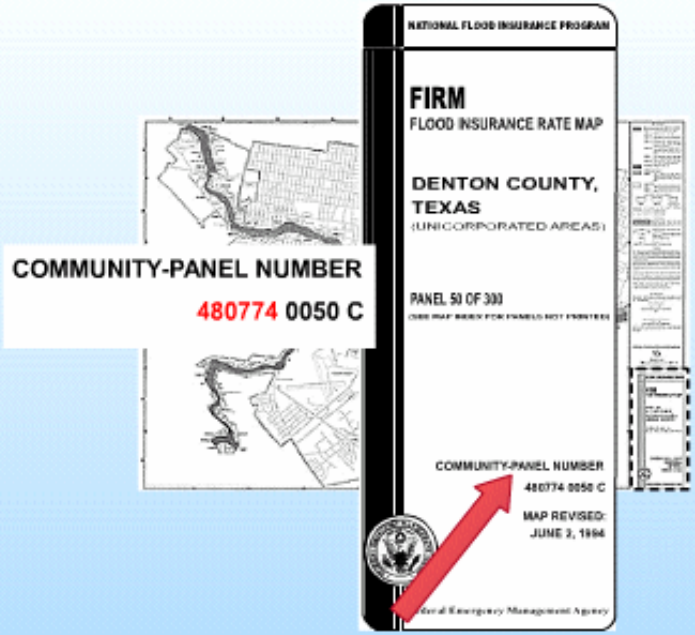
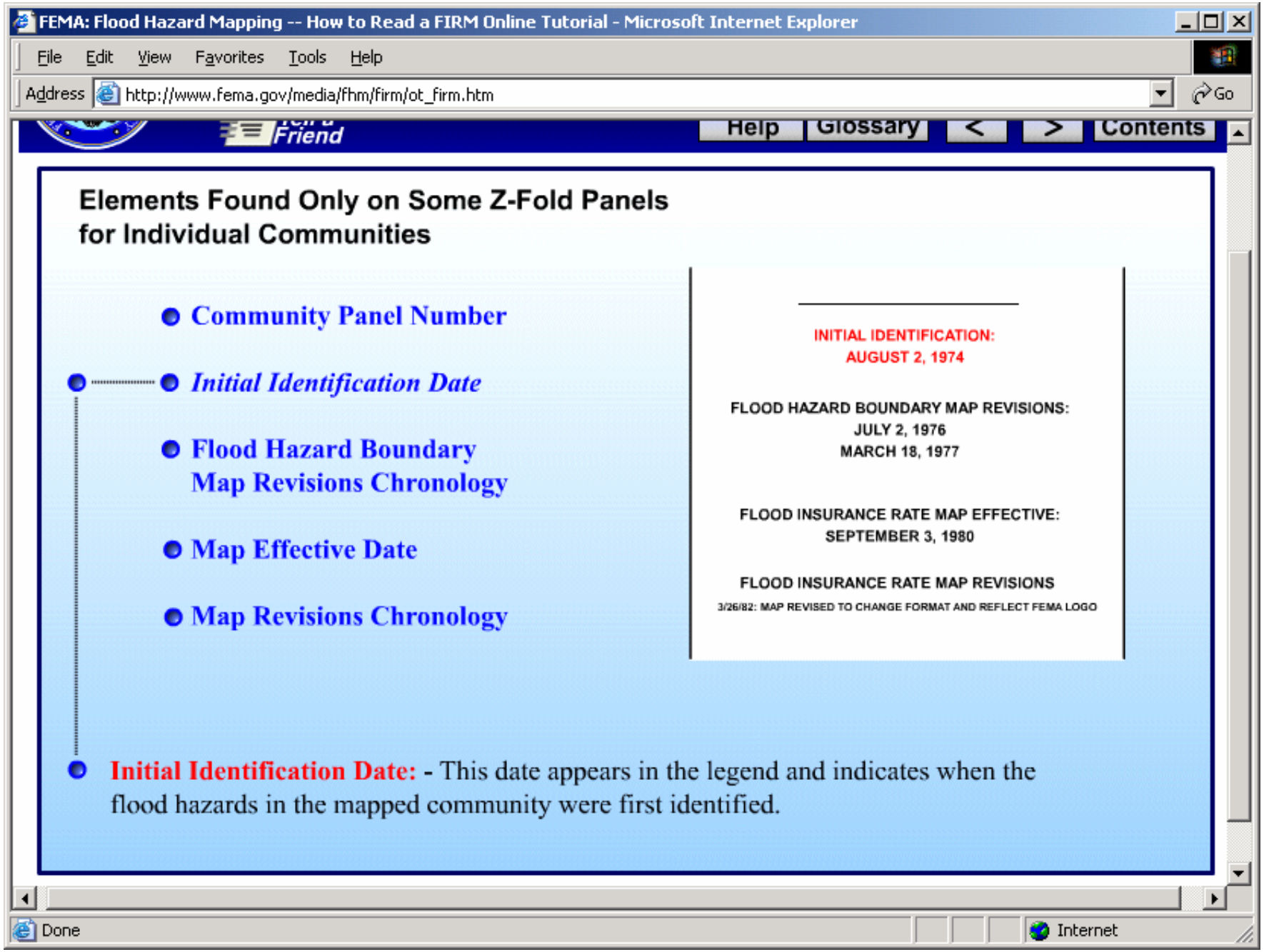
Elements Found Only on Some Z-Fold Panels for Individual Communities

- *Community Panel Number*
- Initial Identification Date
- Flood Hazard Boundary Map Revisions Chronology
- Map Effective Date
- Map Revisions Chronology



- **Community Panel Number:** - This number identifies the community and panel; it corresponds to a community panel number shown on the index. On the FIRM, a letter suffix follows the number and usually indicates the number of times a particular panel has been revised.

Done Internet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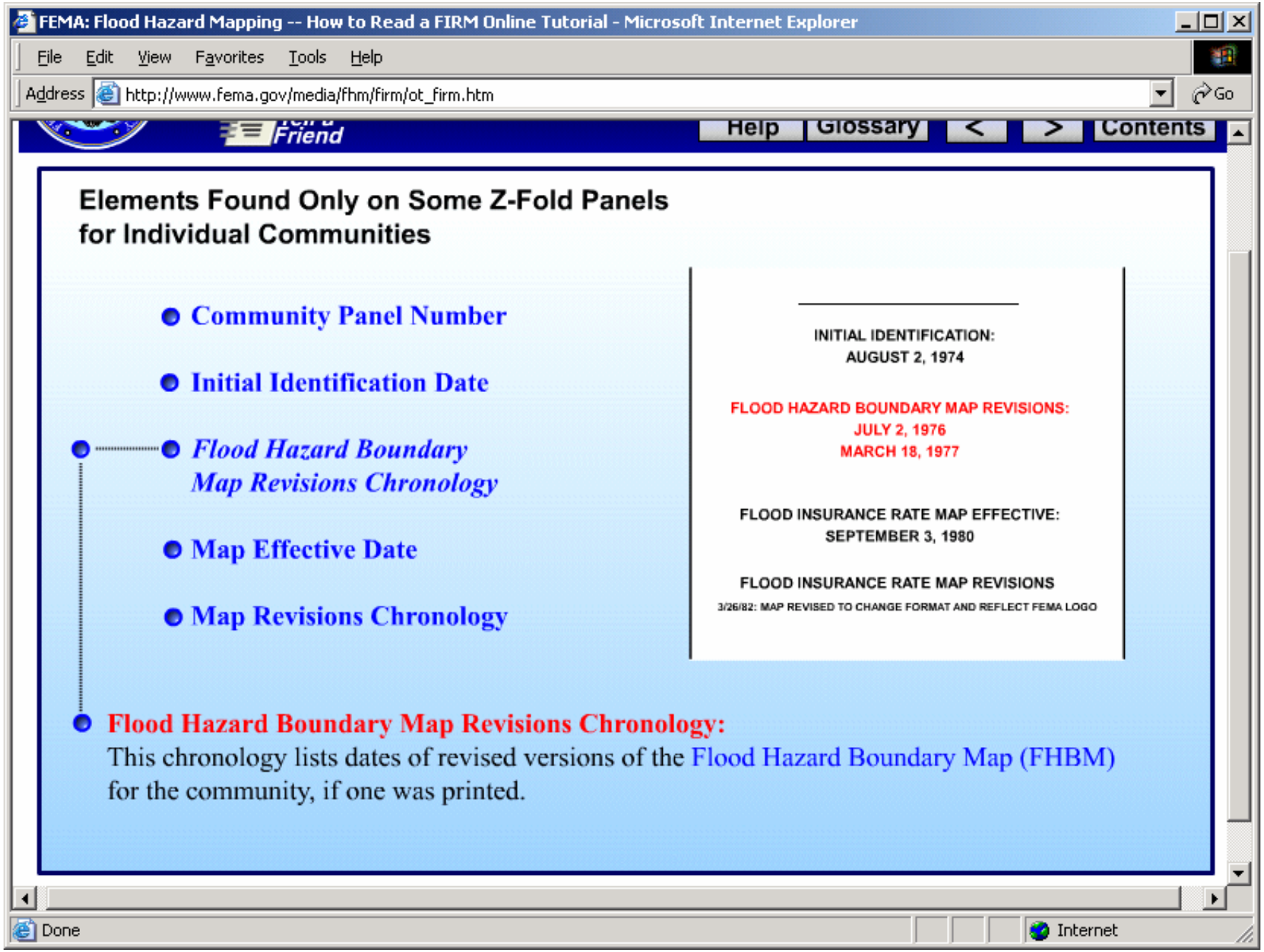
Map Effective Date
Map Revisions Chronology
INITIAL IDENTIFICATION:
AUGUST 2, 1974
FLOOD HAZARD BOUNDARY MAP REVISIONS:
JULY 2, 1976
MARCH 18, 1977
FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 3, 1980
FLOOD INSURANCE RATE MAP REVISIONS
3/26/82: MAP REVISED TO CHANGE FORMAT AND REFLECT FEMA LOGO
Initial Identification Date: - This date appears in the legend and indicates when the flood hazards in the mapped community were first identified.
Done
Internet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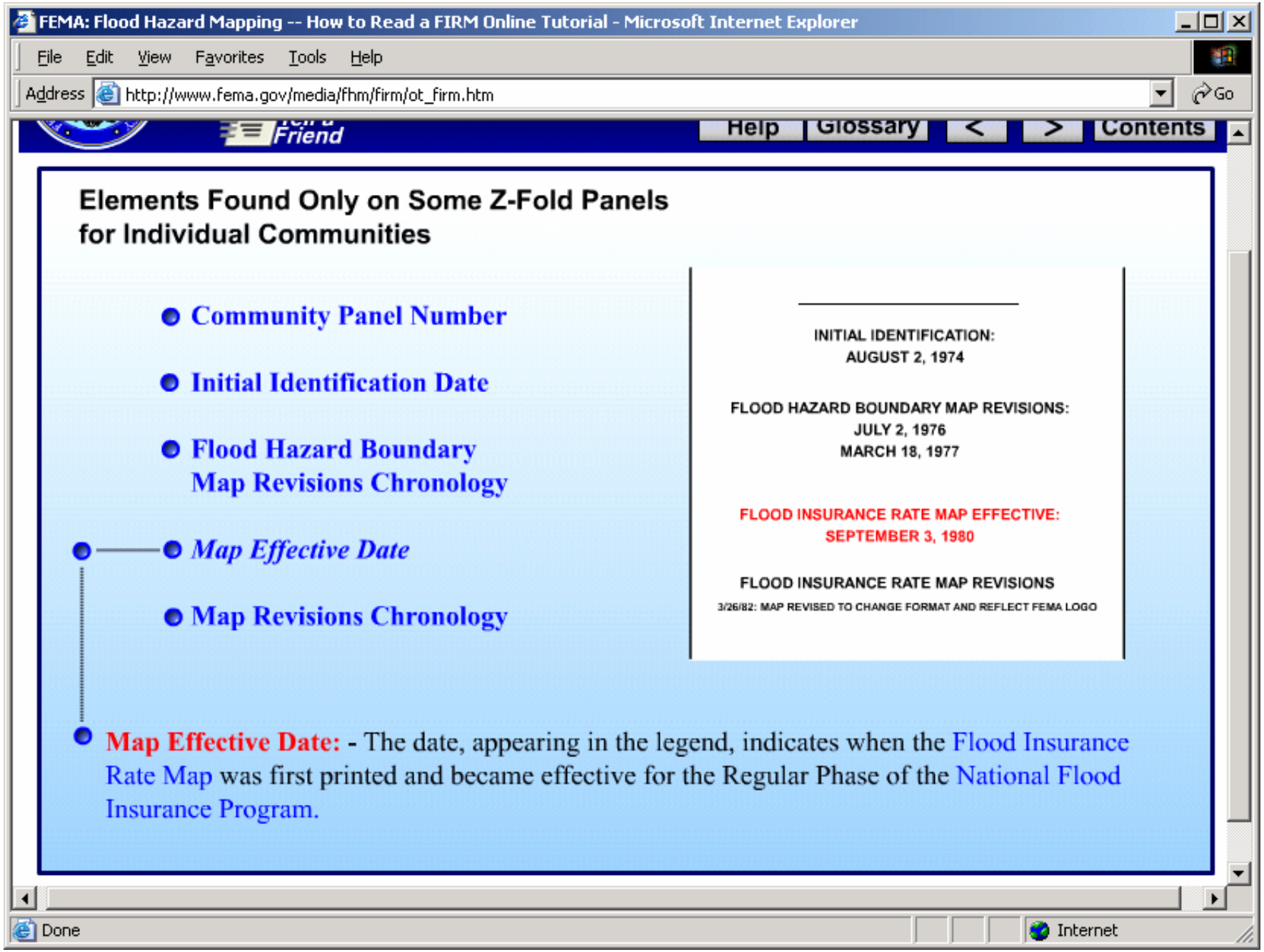
3/26/82: MAP REVISED TO CHANGE FORMAT AND REFLECT FEMA LOGO
Flood Hazard Boundary Map Revisions Chronology:
This chronology lists dates of revised versions of the Flood Hazard Boundary Map (FHBM) for the community, if one was printed.
Done
Internet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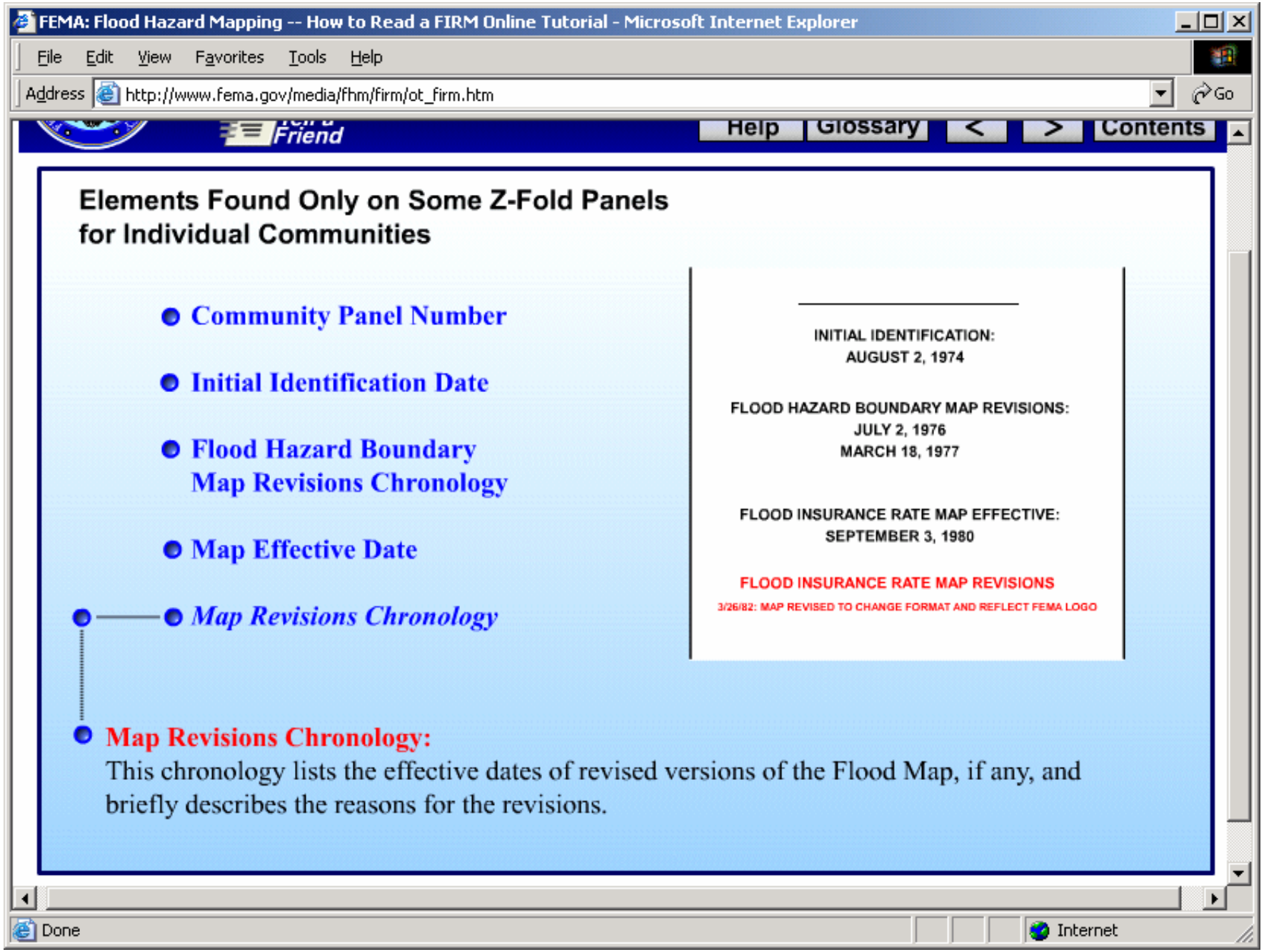
SEPTEMBER 3, 1980
FLOOD INSURANCE RATE MAP REVISIONS
3/26/82: MAP REVISED TO CHANGE FORMAT AND REFLECT FEMA LOGO
Map Effective Date: - The date, appearing in the legend, indicates when the Flood Insurance Rate Map was first printed and became effective for the Regular Phase of the National Flood Insurance Program.
Done
Internet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FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 3, 1980
FLOOD INSURANCE RATE MAP REVISIONS
3/26/82: MAP REVISED TO CHANGE FORMAT AND REFLECT FEMA LOGO
Map Revisions Chronology:
This chronology lists the effective dates of revised versions of the Flood Map, if any, and briefly describes the reasons for the revisions.
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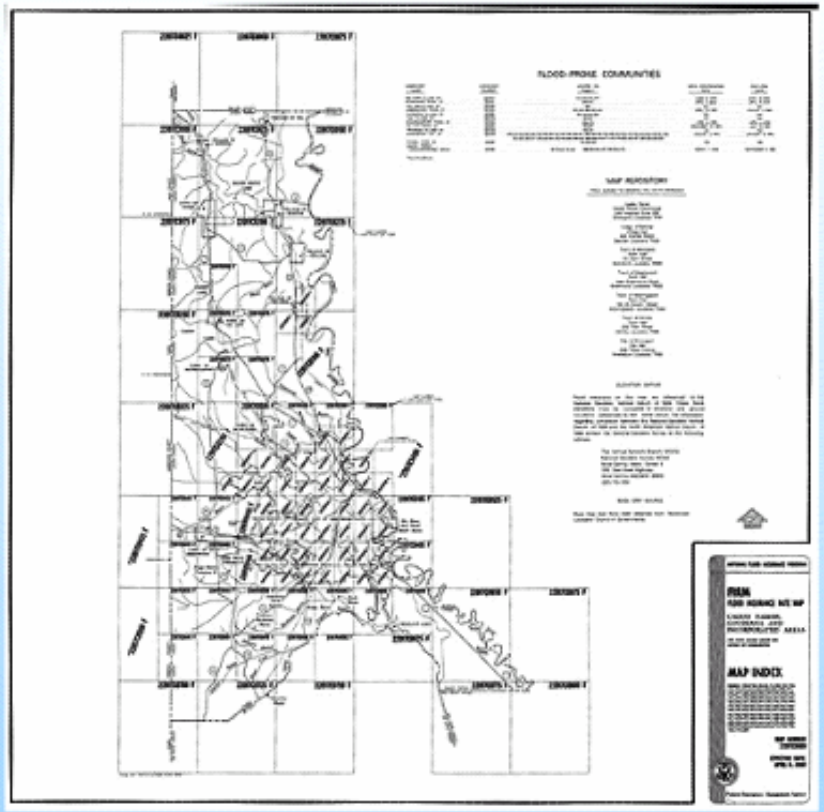
Elements Found Only on Countywide Panels

Effective Date of Countywide Map

Map Number



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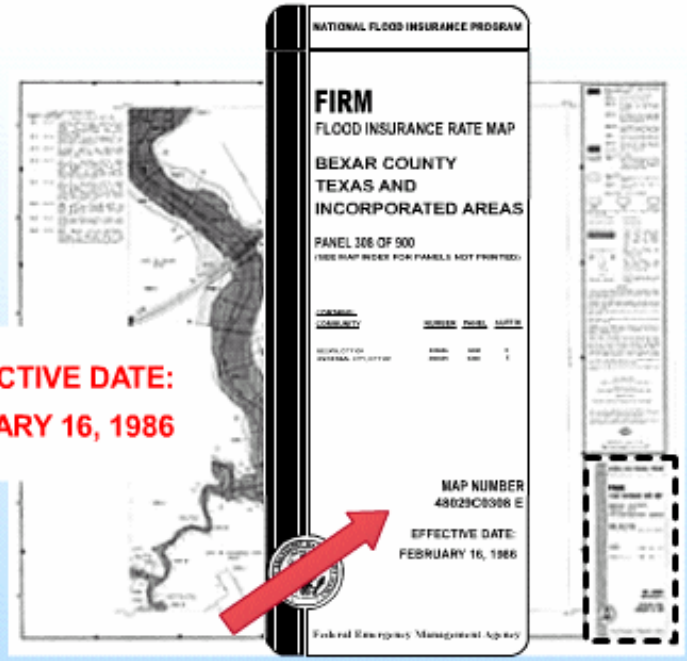
Elements Found Only on Countywide Panels

- *Effective Date of Countywide Map*
- Map Number



EFFECTIVE DATE:
FEBRUARY 16, 1986

- **Effective Date on Countywide Map:** - The date on which the Countywide Flood Map first became effective. Flood Maps may have been in effect for one or more of the individual communities in the county before the Countywide Flood Map was published. If so, the the initial Flood Map Effective Dates for each community will be shown as "Post FIRM Dates" in the List of Flood Prone Communities.

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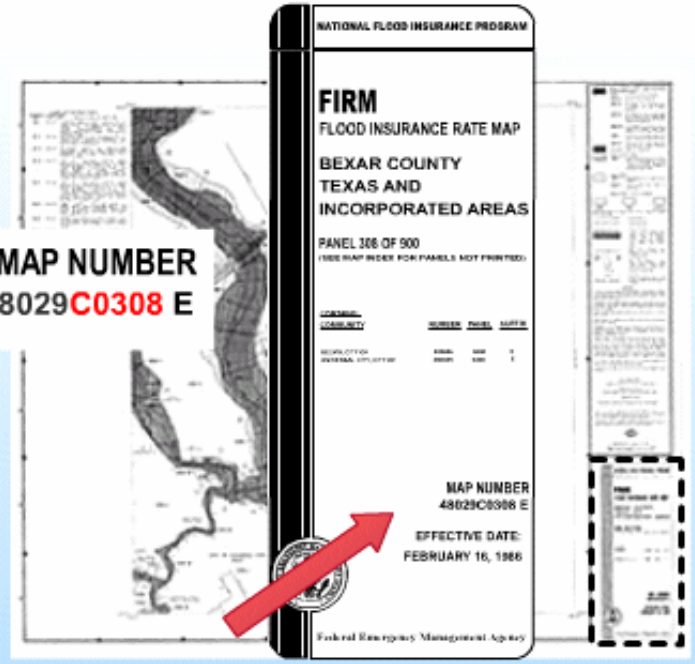
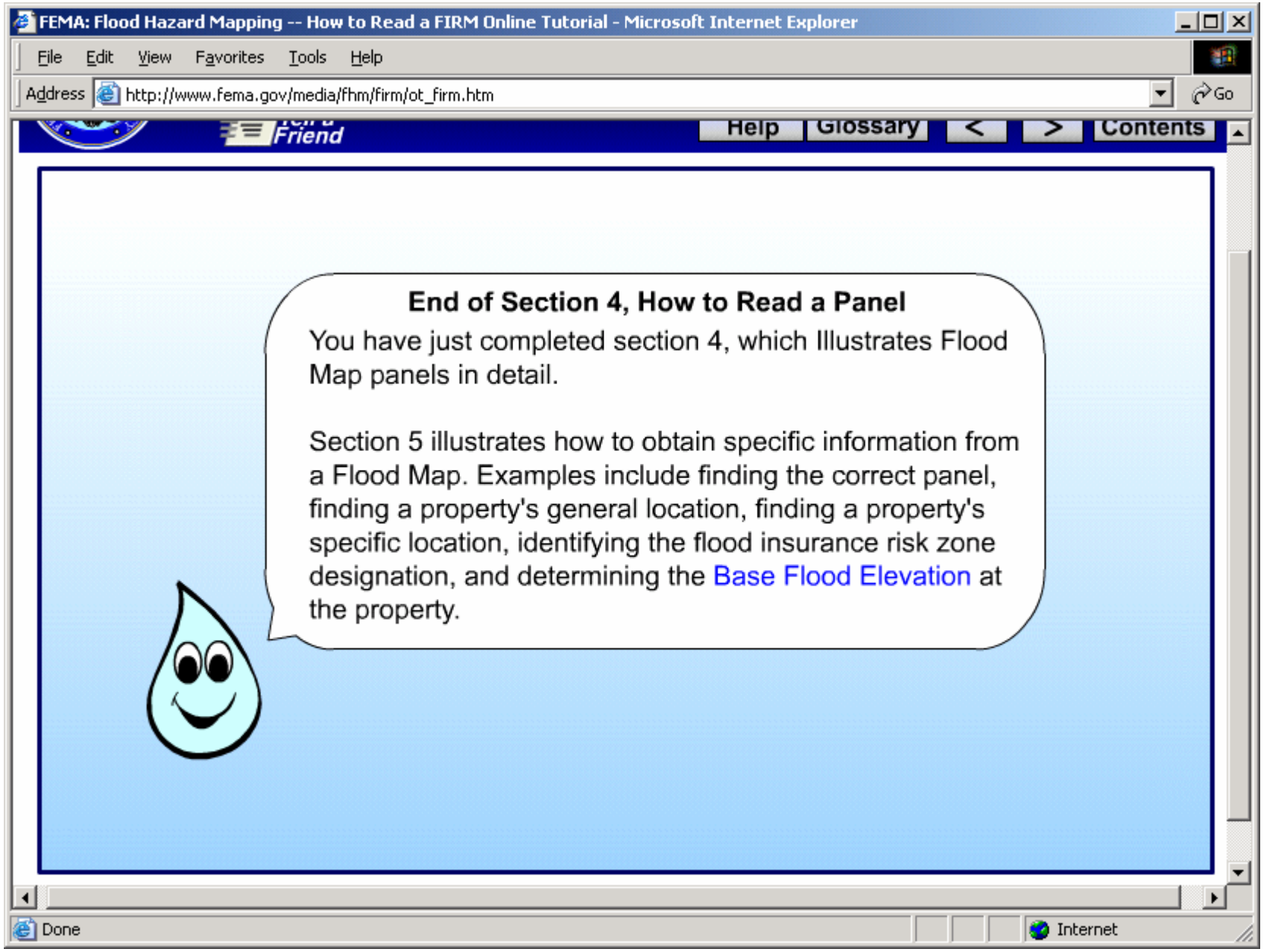
Elements Found Only on Countywide Panels

- Effective Date of Countywide Map
- *Map Number*



- **Map Number:**
  This number identifies the panel. It is composed of a five-digit code that identifies the county; a letter "C" that indicates countywide mapping, and a four-digit number corresponding to the panel number and a letter suffix that indicates the number of times a panel has been revised.

Done Internet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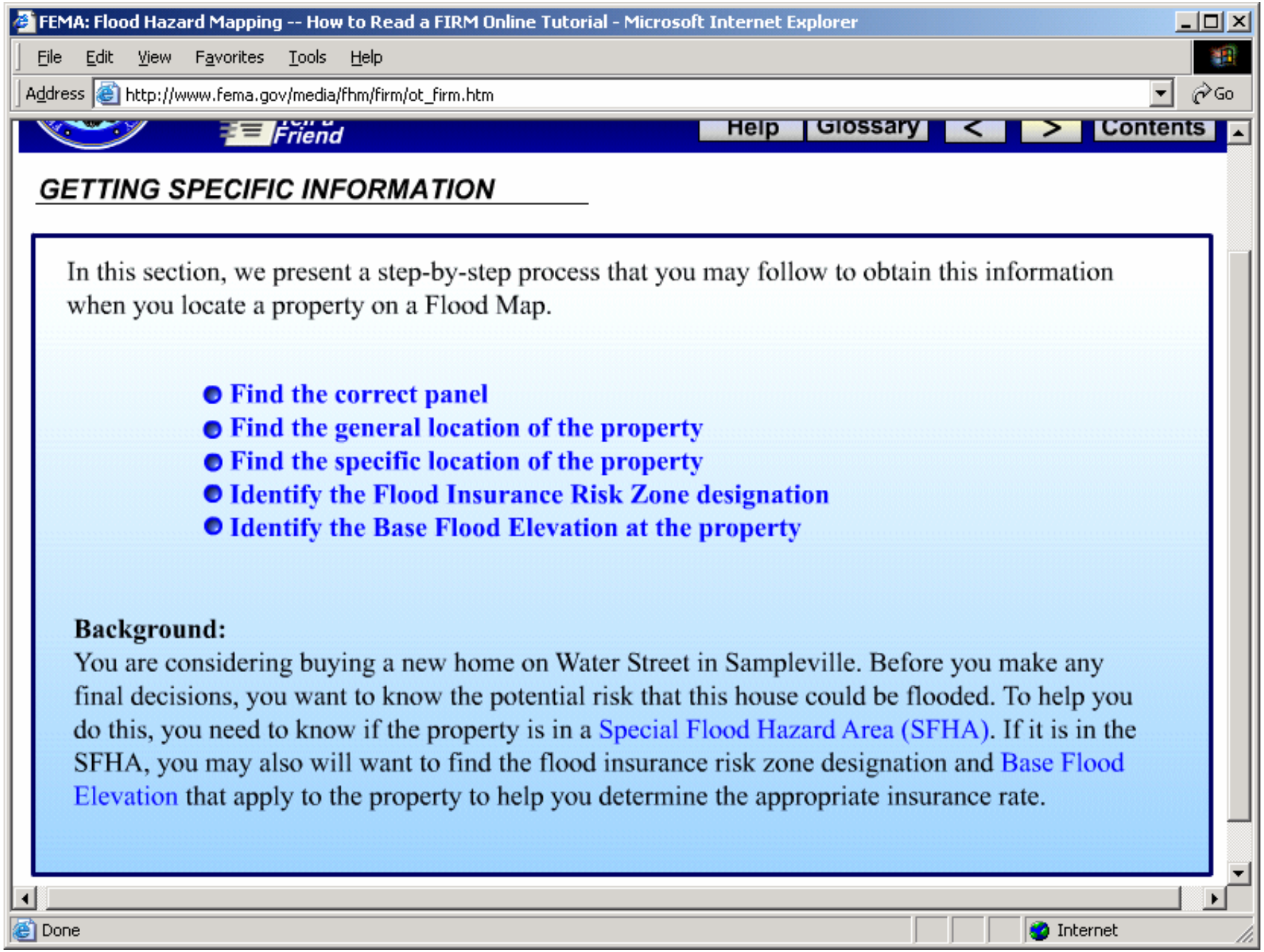
End of Section 4, How to Read a Panel
You have just completed section 4, which Illustrates Flood Map panels in detail.
Section 5 illustrates how to obtain specific information from a Flood Map. Examples include finding the correct panel, finding a property's general location, finding a property's specific location, identifying the flood insurance risk zone designation, and determining the Base Flood Elevation at the property.
Done
Internet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GETTING SPECIFIC INFORMATION
In this section, we present a step-by-step process that you may follow to obtain this information when you locate a property on a Flood Map.
Find the correct panel
Find the general location of the property
Find the specific location of the property
Identify the Flood Insurance Risk Zone designation
Identify the Base Flood Elevation at the property
Background:
You are considering buying a new home on Water Street in Sampleville. Before you make any final decisions, you want to know the potential risk that this house could be flooded. To help you do this, you need to know if the property is in a Special Flood Hazard Area (SFHA). If it is in the SFHA, you may also will want to find the flood insurance risk zone designation and Base Flood Elevation that apply to the property to help you determine the appropriate insurance rate.
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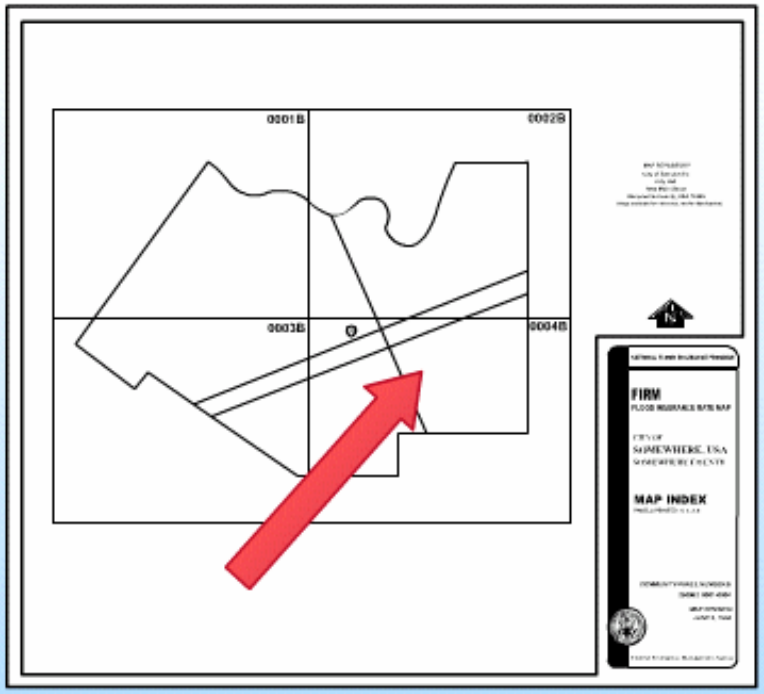
Step 1: Find The Correct Panel

To find the panel that covers the property, you will first refer to the index for the Sampleville Flood Map (figure at right). By reviewing the index, you learn that the Flood Map you need was prepared in a Z-Fold format composed of four panels. The index title box indicates that all four panels (0001, 0002, 0003, and 0004) are printed. You then check the title boxes on individual panels to find Panel 0004.

Background: You know that the property is on Water Street, which lies in the southeastern portion of the town, south of Interstate Highway 32. Although Water Street is not on the index, you may have determined from the north arrow and the major roads shown on the index that Water Street is on Panel 0004.



Sampleville Community Flood Map Index

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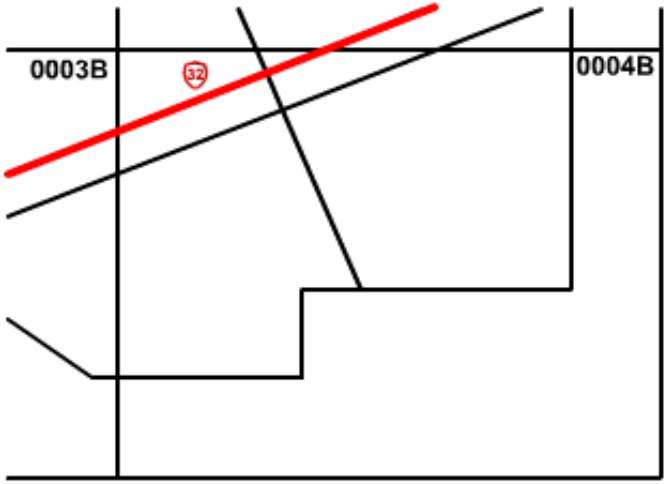
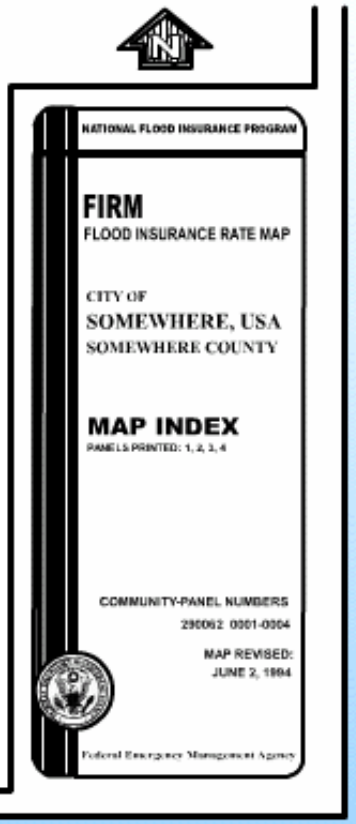
Step 1: Find The Correct Panel

Checking the location of Highay 32, you determine the property is located on the southeast part of the index.





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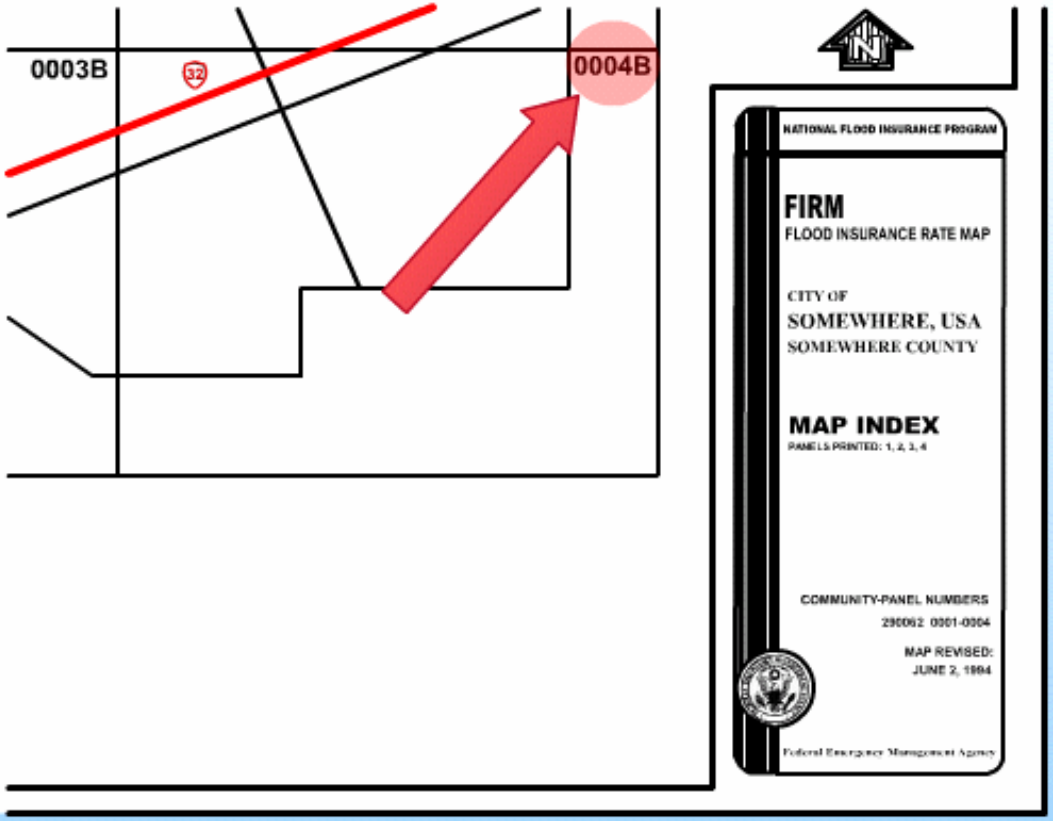
Step 1: Find The Correct Panel

Checking the panel number, you need Panel ***0004***



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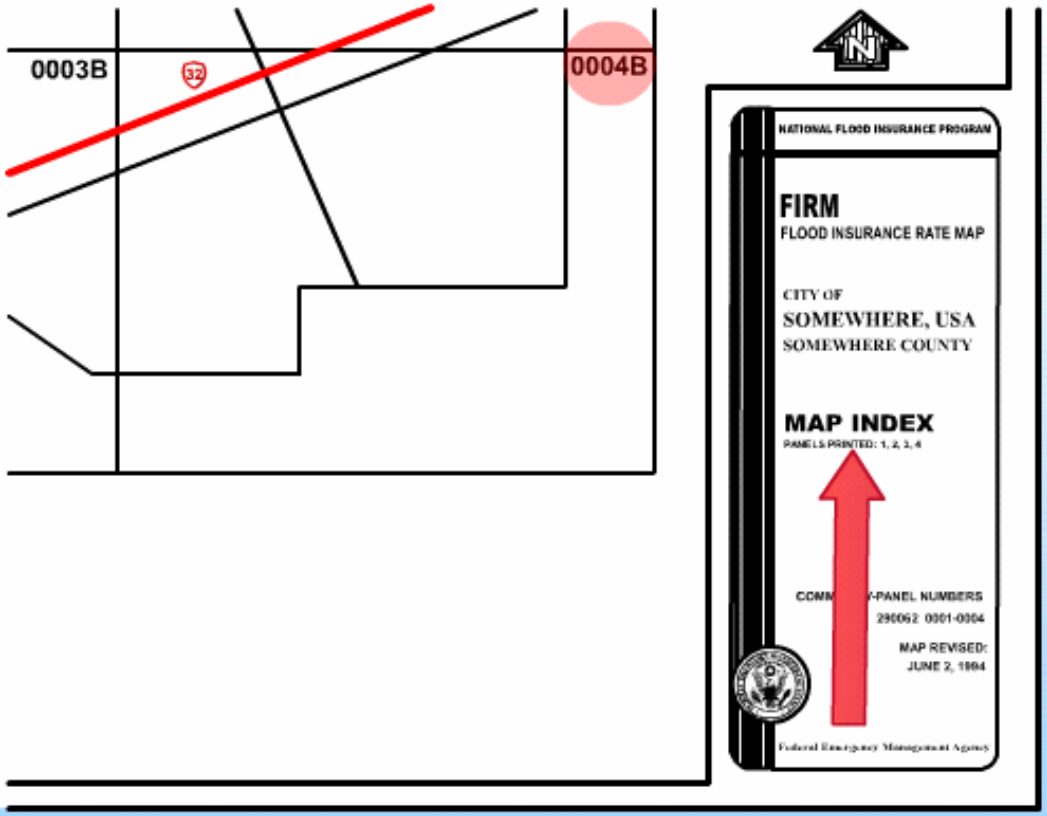
Step 1: Find The Correct Panel



Look to the title box to see that Panel 0004 is printed

Done Internet

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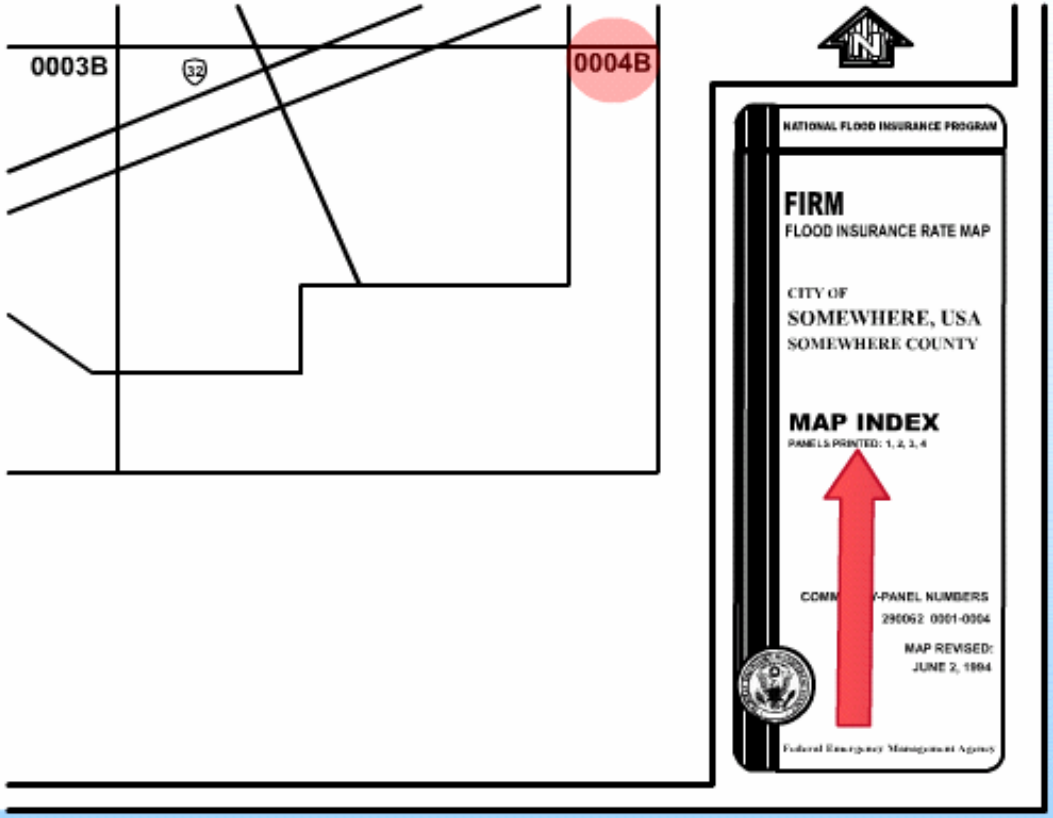
Step 1: Find The Correct Panel

MAP INDEX

PANELS PRINTED: 1, 2, 3, 4

Look to the title box to see that Panel 0004 is printed



Done Internet

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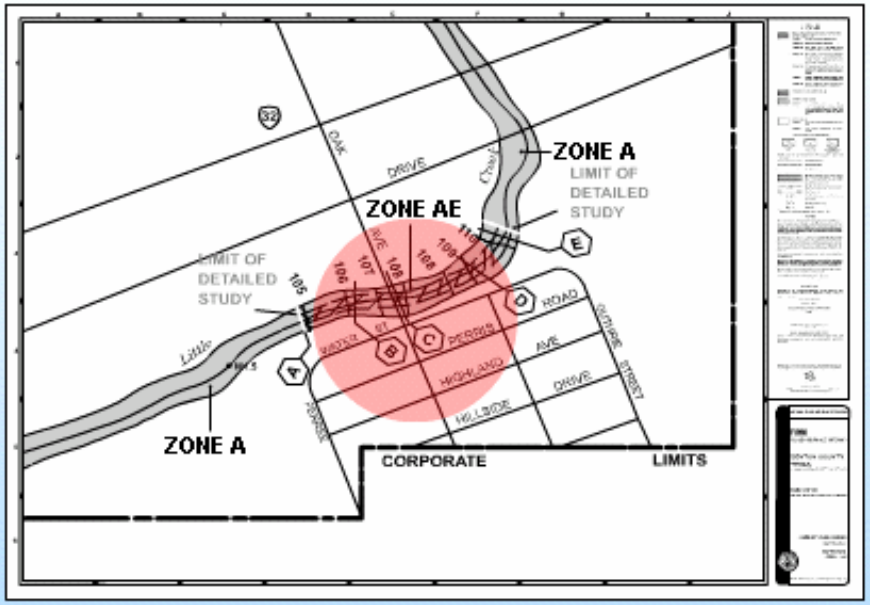
Step 2: Find The General Location

Using the panel number determined from the index, you obtained Panel 0004 that shows the property. Because the individual panel shows more physical landmarks than the index, you can find the general location by referring to features such as major roads or city limits.

Your property is located east of the main intersection of Oak Avenue, and Water Street as seen in the figure to the right. To find the specific property location, you will use known property dimensions and the Flood Map scale.



Sampleville Panel # 0004

In addition, to find the specific location of the property, you may refer to a plat map of the property, tax assessor's map, or the property description found on the deed. The next slide shows how to determine the specific location of the property.

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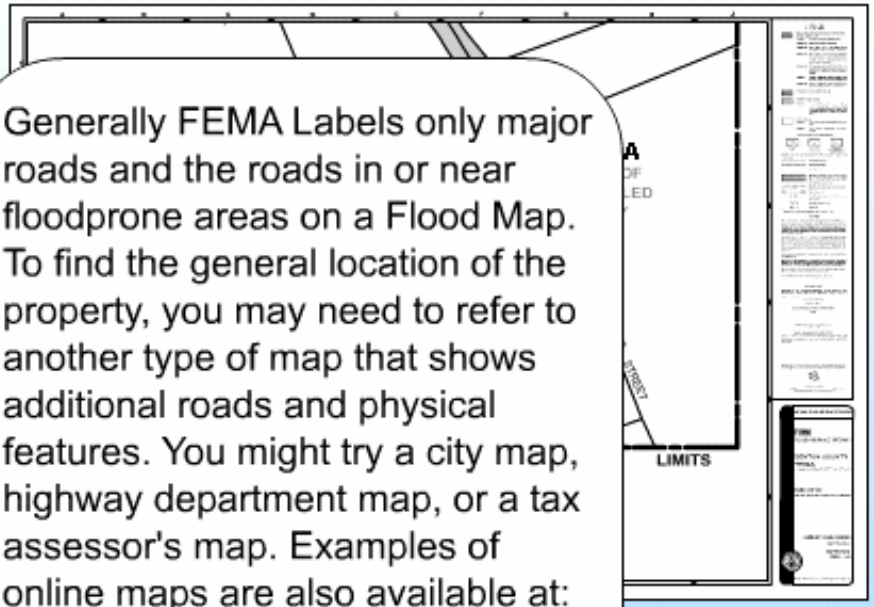
In addition, to find the specific location of th of the property, tax assessor's map, or the property description found on the deed. The next slide shows how to determine the specific location of the property.



Generally FEMA Labels only major roads and the roads in or near floodprone areas on a Flood Map. To find the general location of the property, you may need to refer to another type of map that shows additional roads and physical features. You might try a city map, highway department map, or a tax assessor's map. Examples of online maps are also available at:

http://www.mapblast.com

http://www.mapquest.com

Click to close

Done Internet

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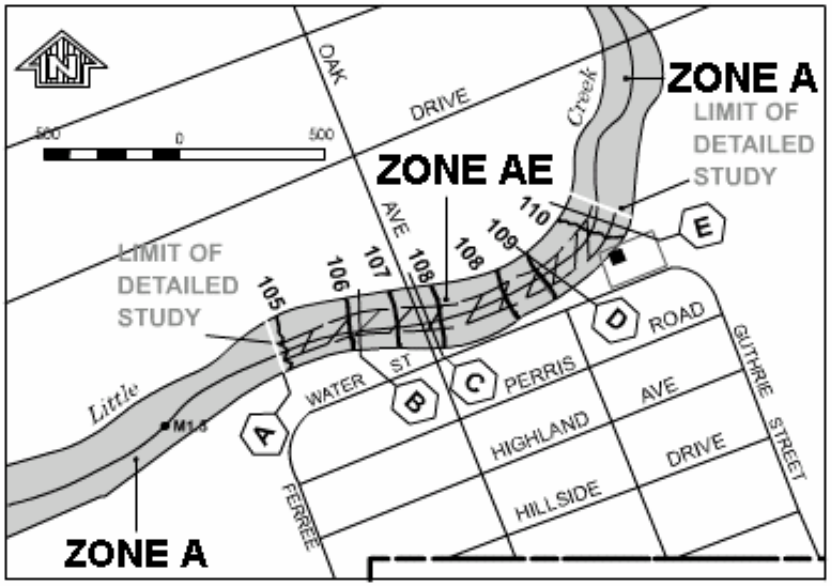
Step 3: Find The Specific Location Of The Property

You know the property lies on the northern side of Water Street, east of the intersection of Oak Ave. and Water St.

First, you find the dimensions of the property on a tax assessor's map, a plat map, or in a legal description.

Show Me

Then, you convert the known dimensions to inches using the Flood Map scale and measurements on the Flood Map panel.



For example, at the map scale shown for the map portion in the figure above (1 inch=500 feet), you will note that 250 feet on the ground is equal to 1/2 inch on the Flood Map, and 50 feet on the ground is equal to 1/10 inch on the Flood Map. See the next slide for a description of how to determine the specific location using the map scale.

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Step 3: Find

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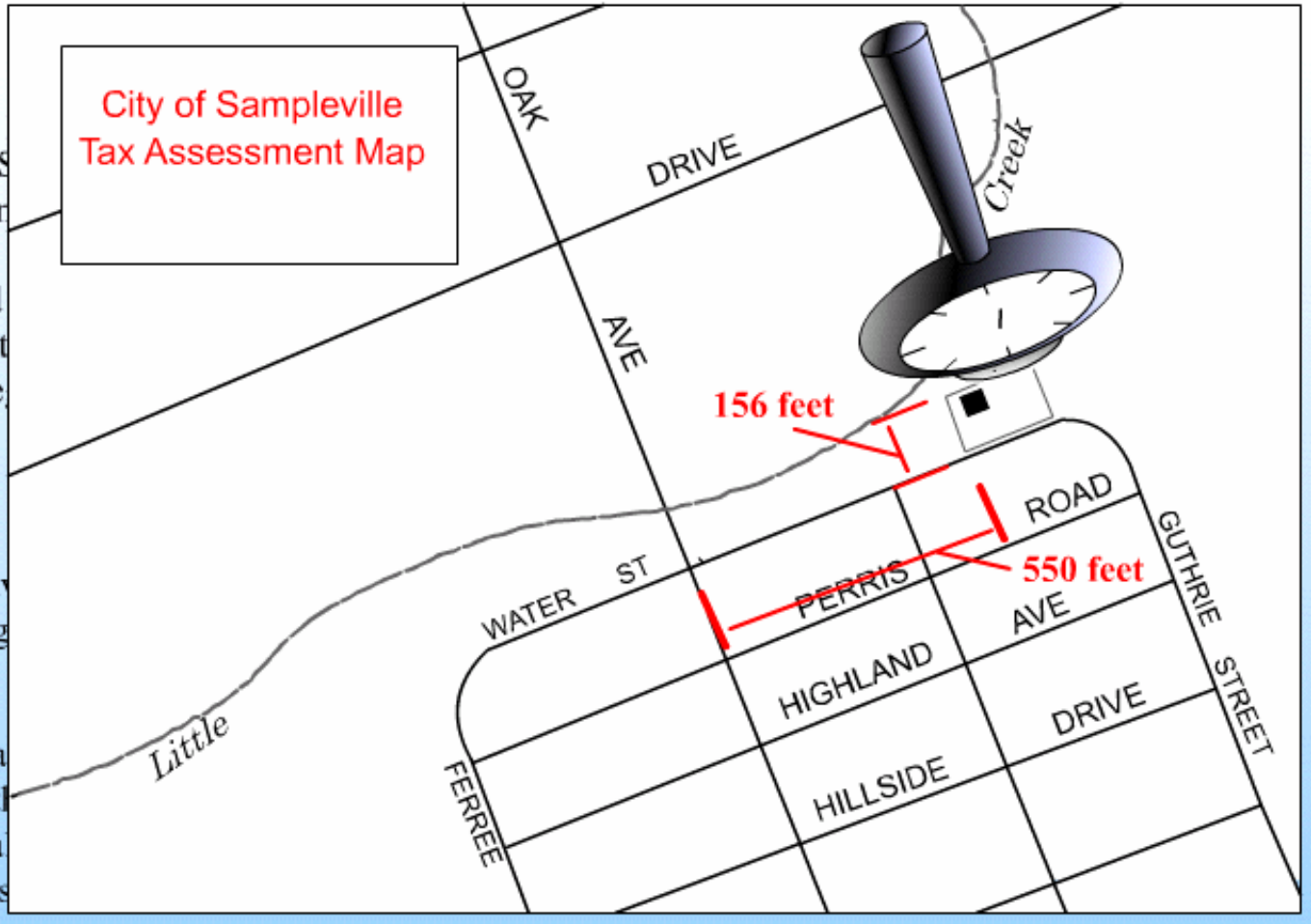

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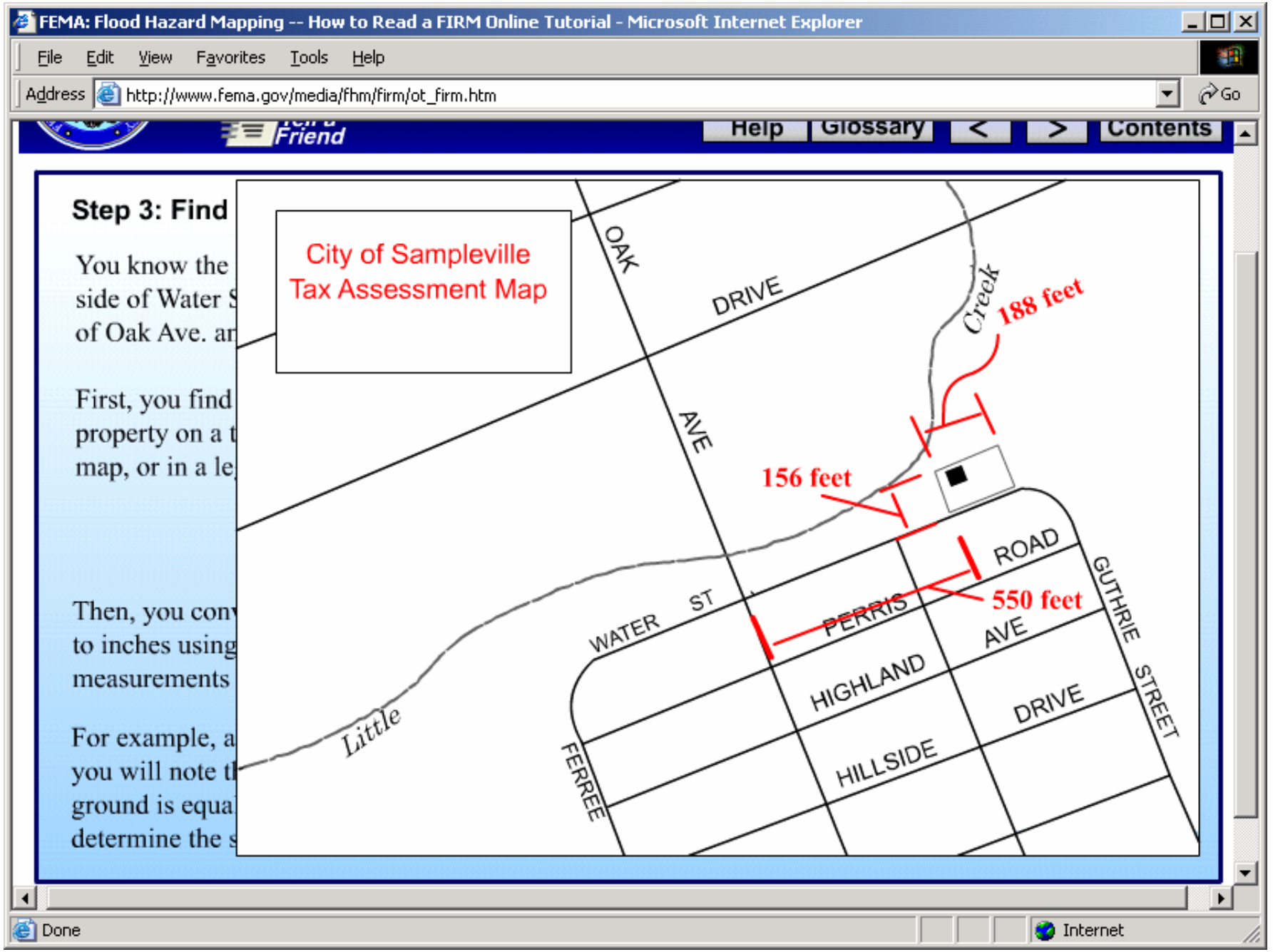
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550 feet
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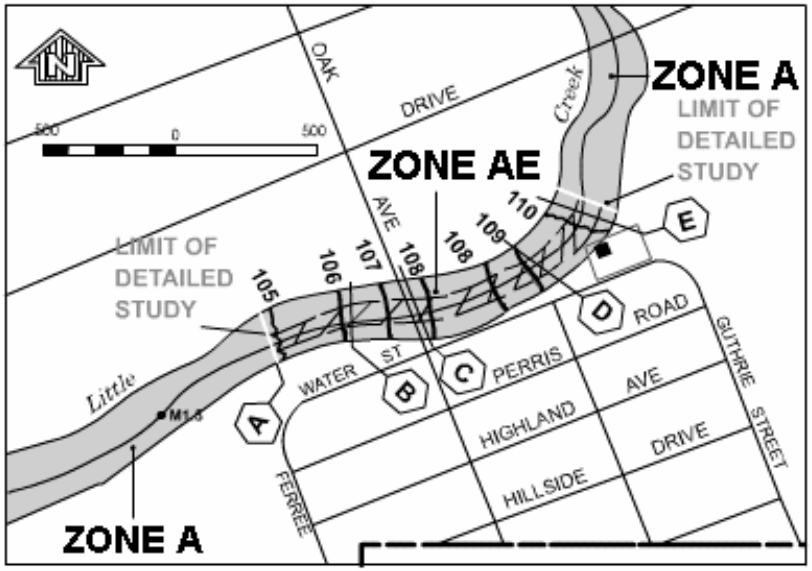
Step 4: Identify The Flood Insurance Risk Zone Of The Property

As shown on the map on the right, the property you are considering buying is partially in the dark-tinted Special Flood Hazard Area (SFHA). In addition, the building on the property is partially in the SFHA. (Note: Current NFIP regulations indicate that if any portion of a building is in the SFHA, the entire building is considered to be in the SFHA.)

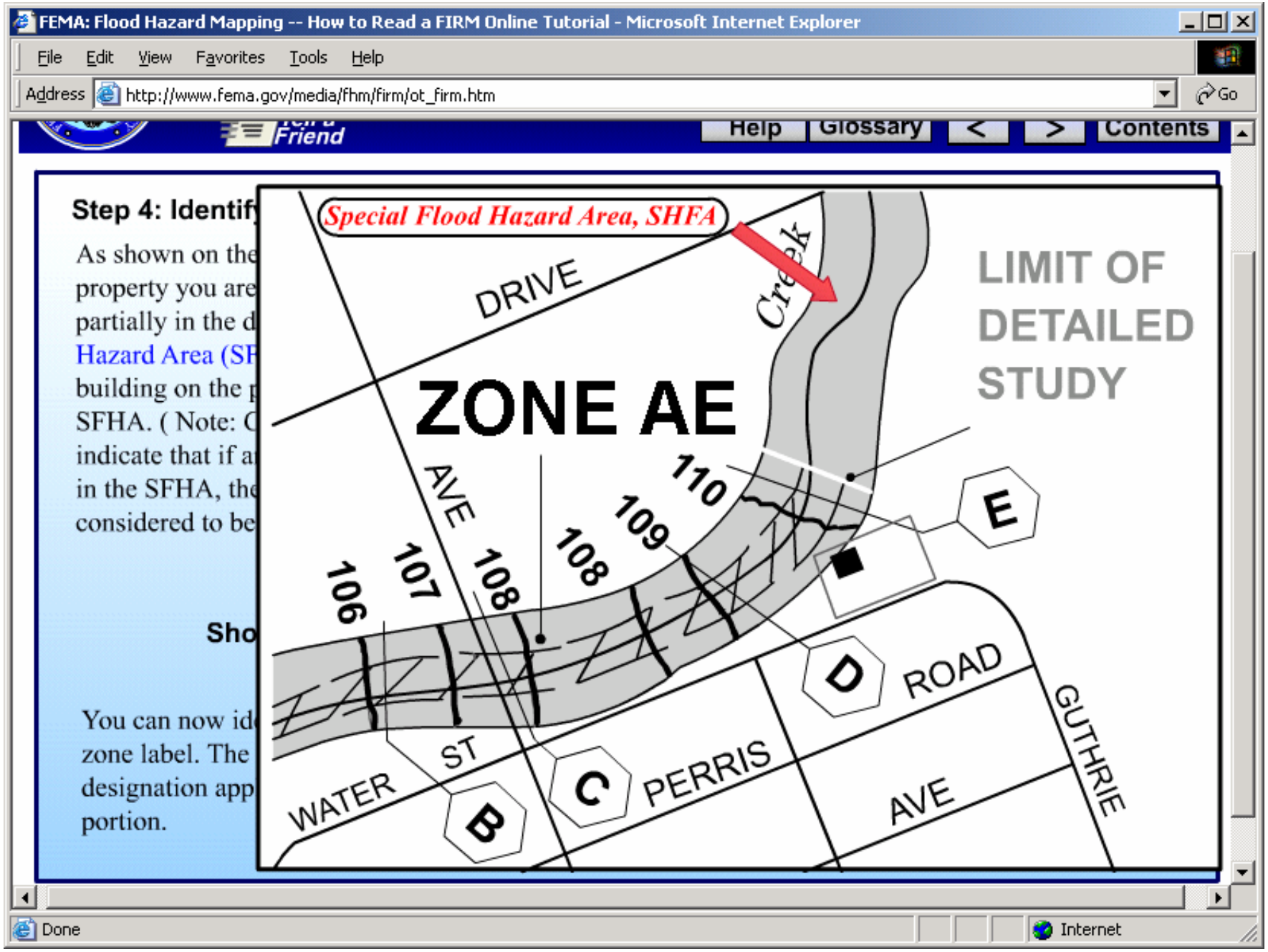
Show Me



You can now identify the flood insurance risk zone designation for the property by finding the zone label. The Special Flood Hazard Area near the property is labeled Zone AE. The zone designation applies both to the portion of the property in the SFHA and to any building on that portion.

Special Flood Hazard Area (SFHA)
Area inundated by the base (1-percent annual chance) flood, identified on the Flood Insurance Rate Map as Zones A, AE, AH, AO, AR, V, VE, or A99.

Done Internet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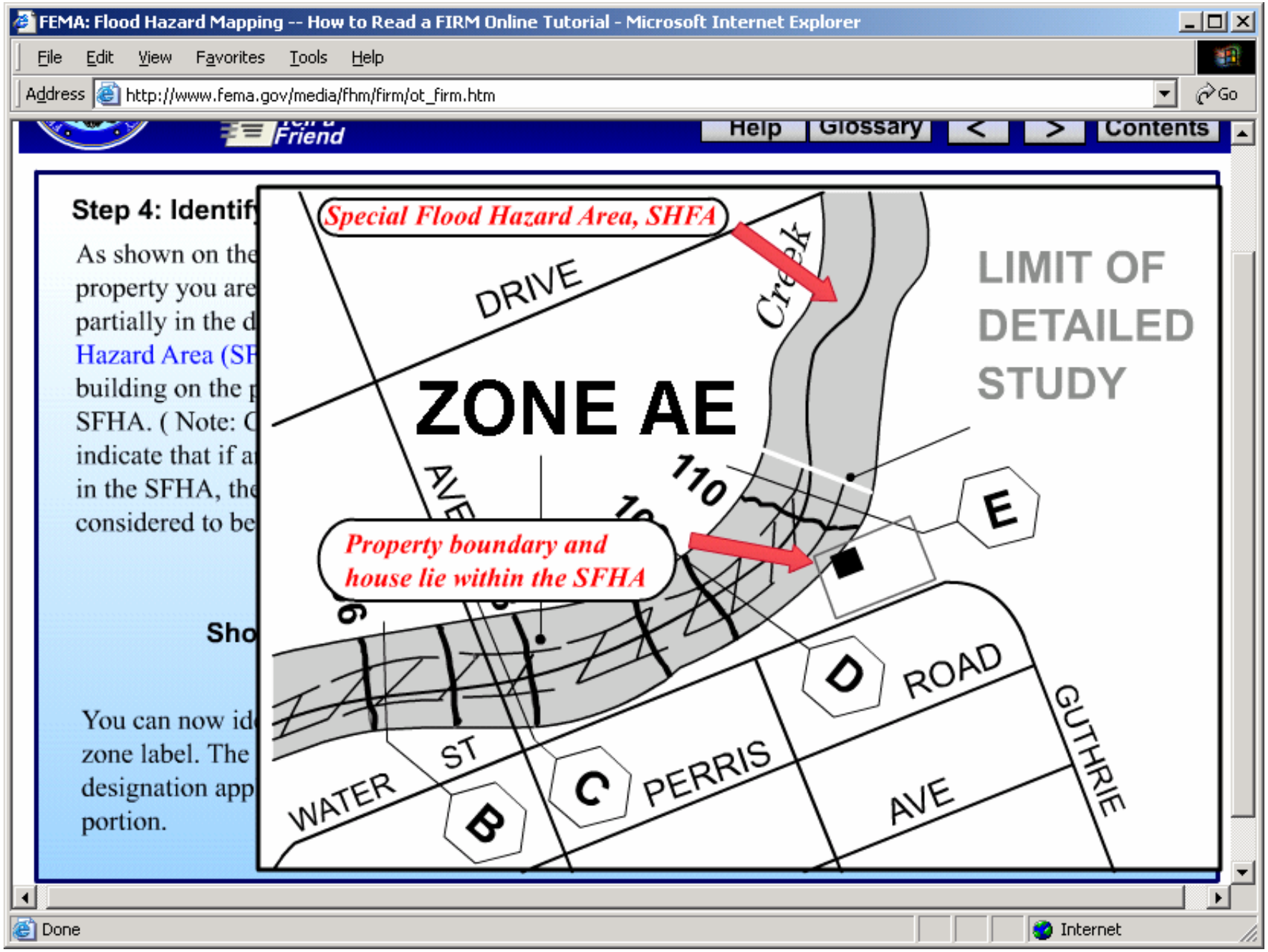
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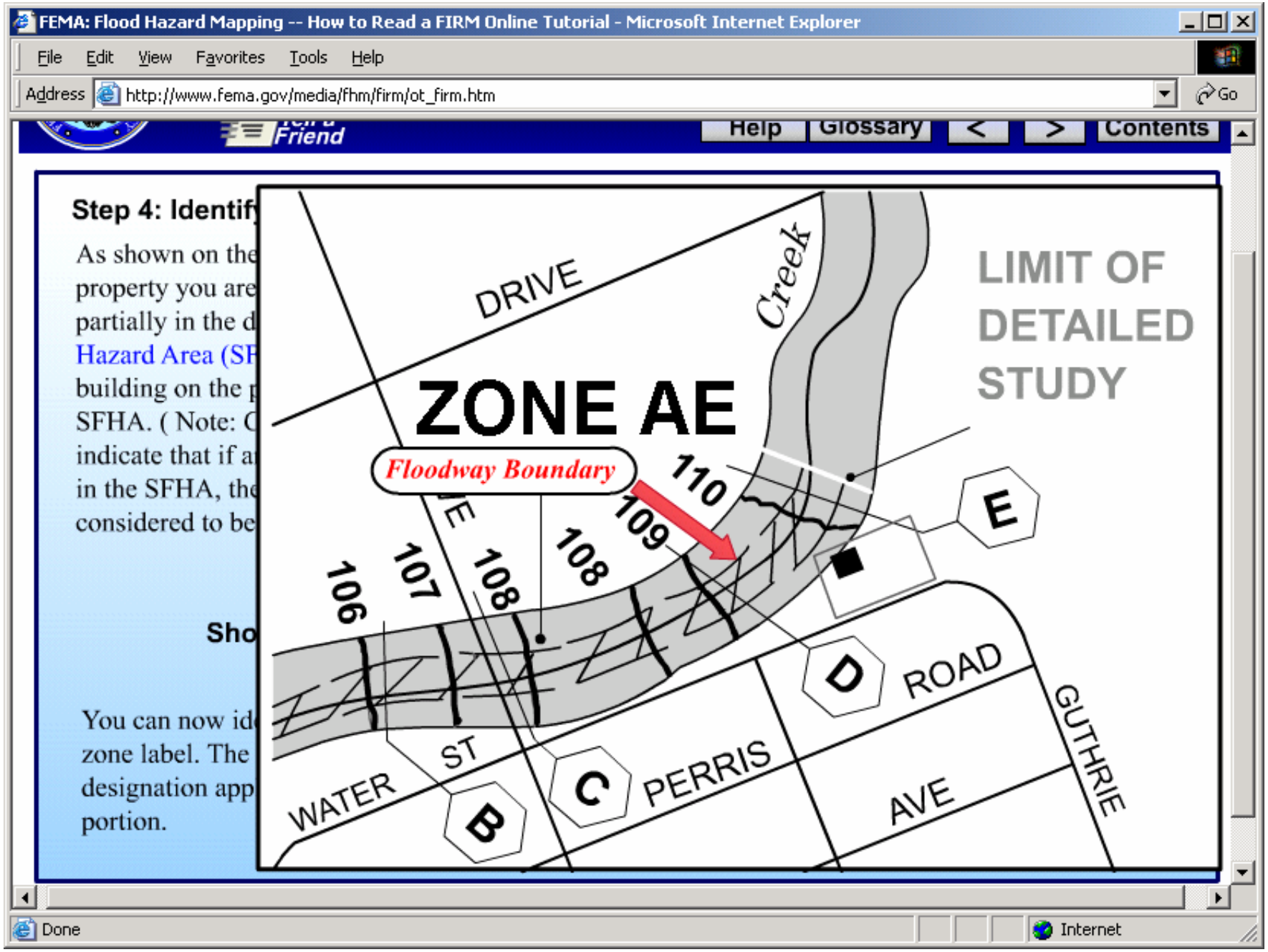
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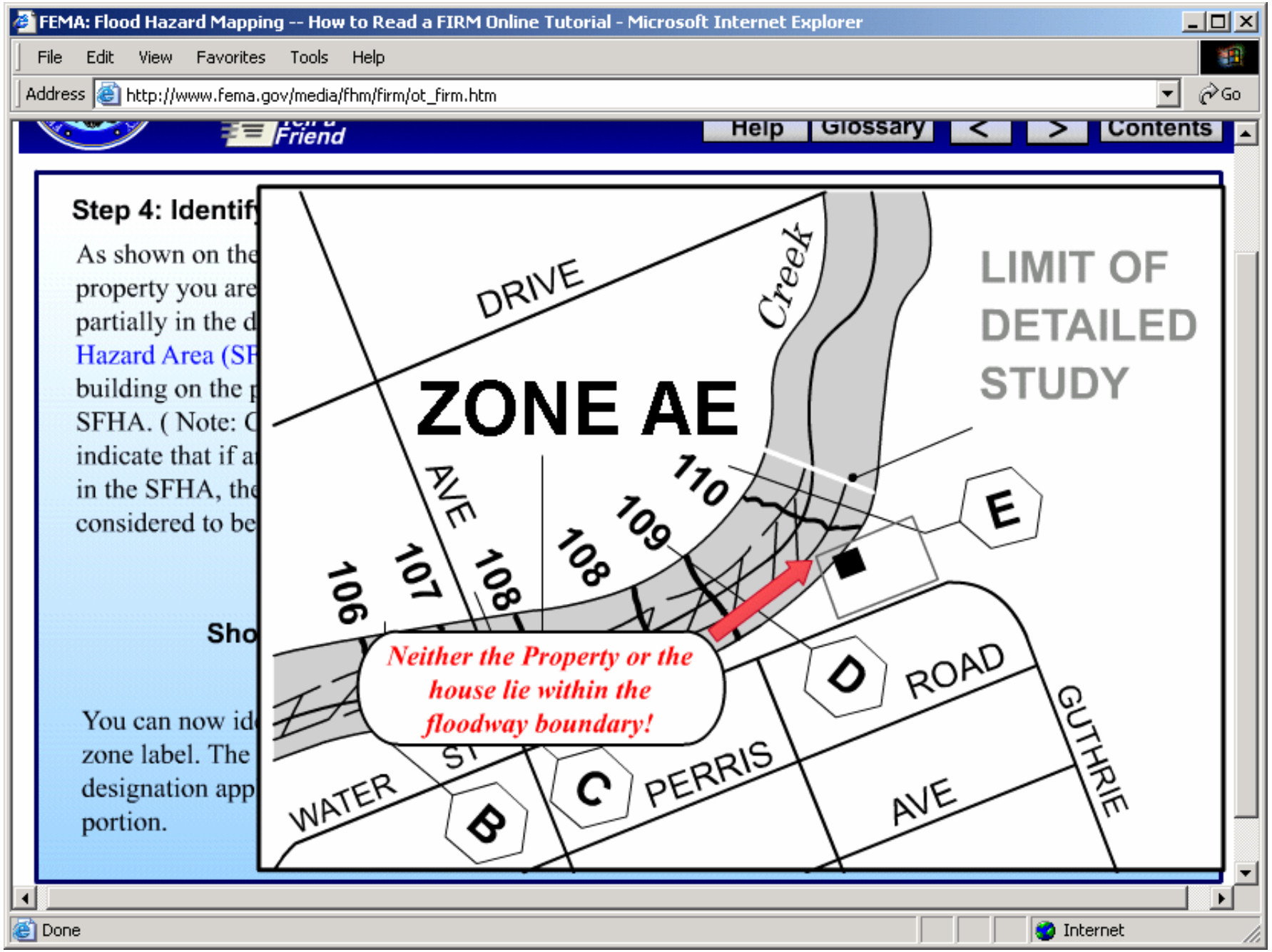
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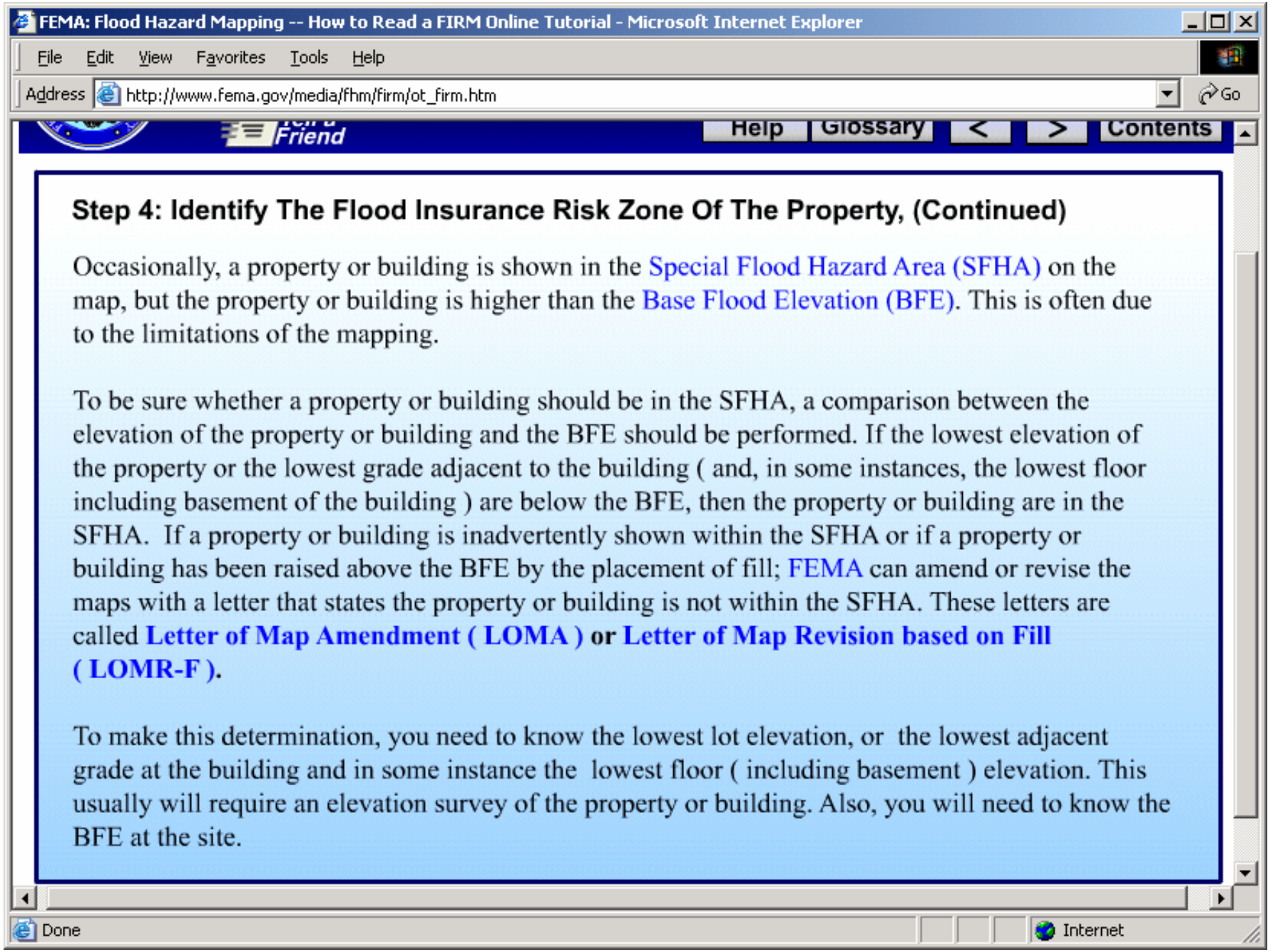
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Occasionally, a property or building is shown in the Special Flood Hazard Area (SFHA) on the map, but the property or building is higher than the Base Flood Elevation (BFE). This is often due to the limitations of the mapping.
To be sure whether a property or building should be in the SFHA, a comparison between the elevation of the property or building and the BFE should be performed. If the lowest elevation of the property or the lowest grade adjacent to the building (and, in some instances, the lowest floor including basement of the building) are below the BFE, then the property or building are in the SFHA. If a property or building is inadvertently shown within the SFHA or if a property or building has been raised above the BFE by the placement of fill; FEMA can amend or revise the maps with a letter that states the property or building is not within the SFHA. These letters are called Letter of Map Amendment (LOMA) or Letter of Map Revision based on Fill (LOMR-F).
To make this determination, you need to know the lowest lot elevation, or the lowest adjacent grade at the building and in some instance the lowest floor (including basement) elevation. This usually will require an elevation survey of the property or building. Also, you will need to know the BFE at the site.
Done
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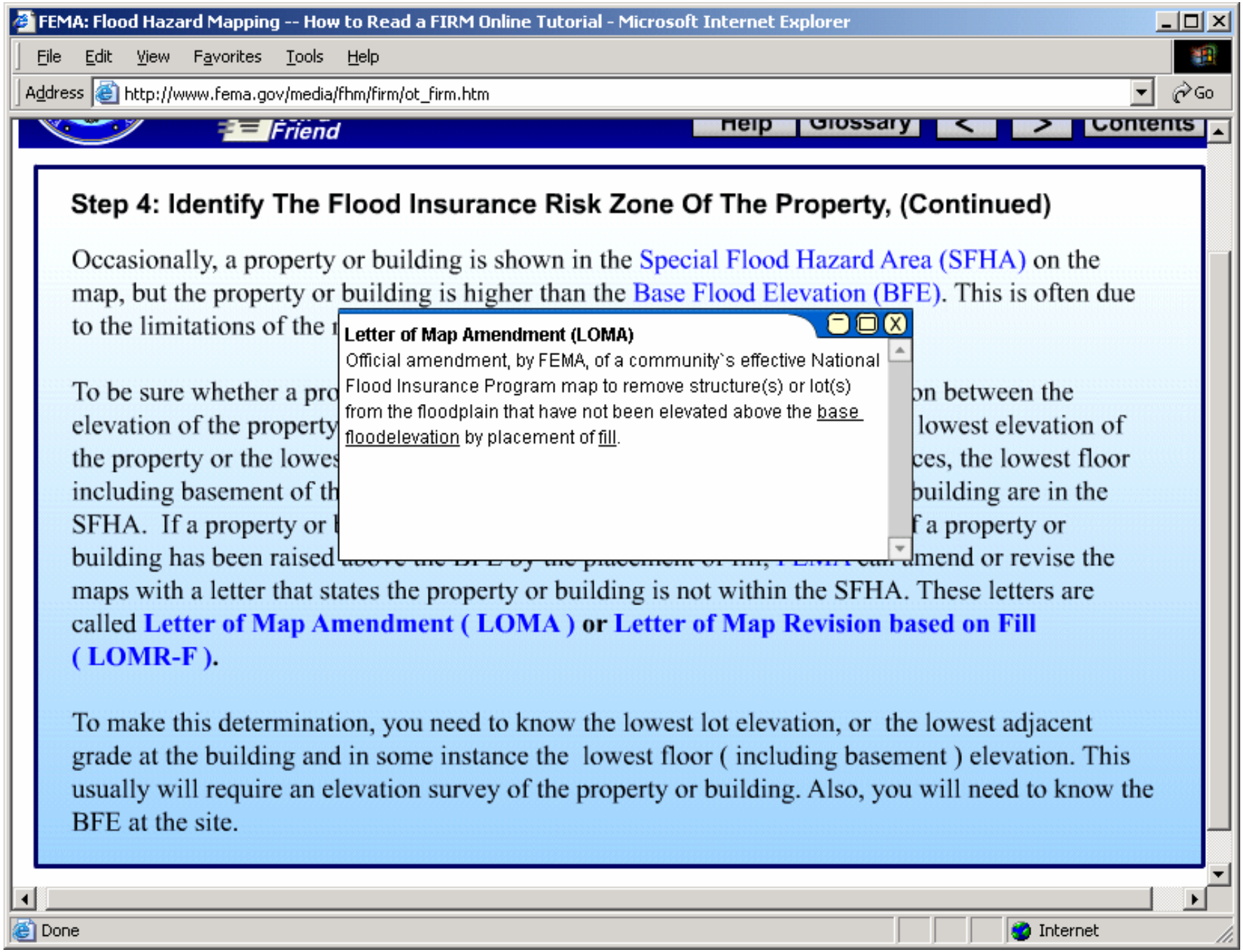
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Done
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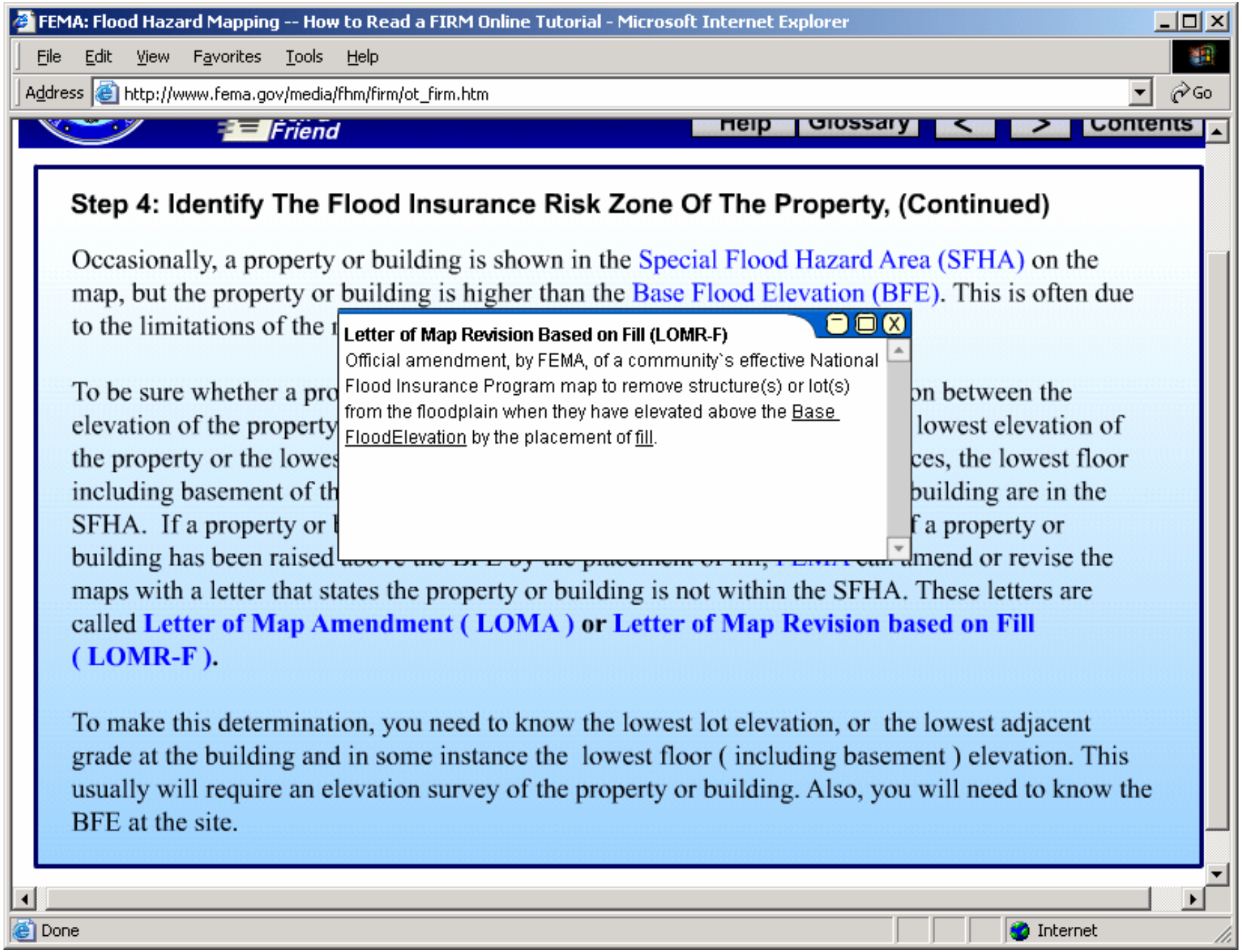
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Done
Internet

Step 5: Identify The Base Flood Elevation At The Property

To estimate a Base Flood Elevation (BFE) at a property the BFE lines (labels) shown near the property on the Flood Map can be used. As shown on the map, BFE lines 109 and 110 are near the property, and 110 is the nearer of the two. When a property is between two BFE lines, as in this example, you may estimate the BFE at the property by interpolating between the two Base Flood Elevations.

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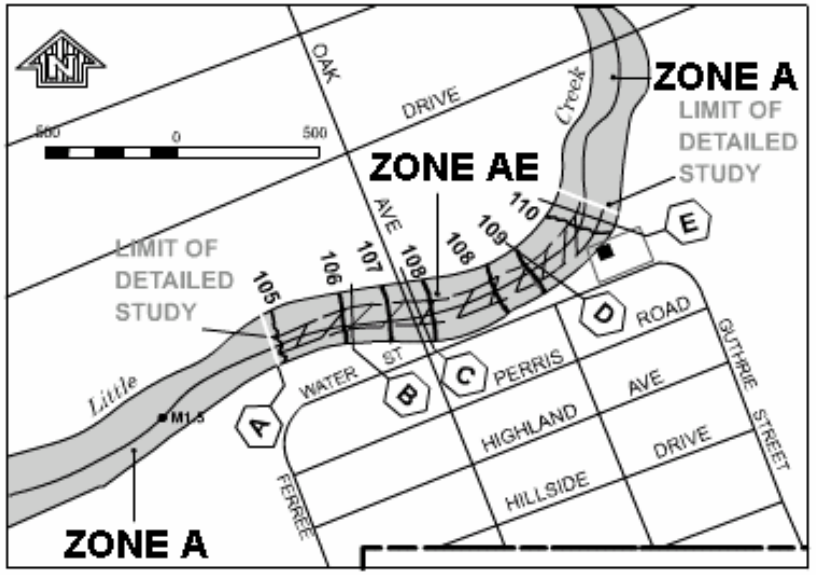
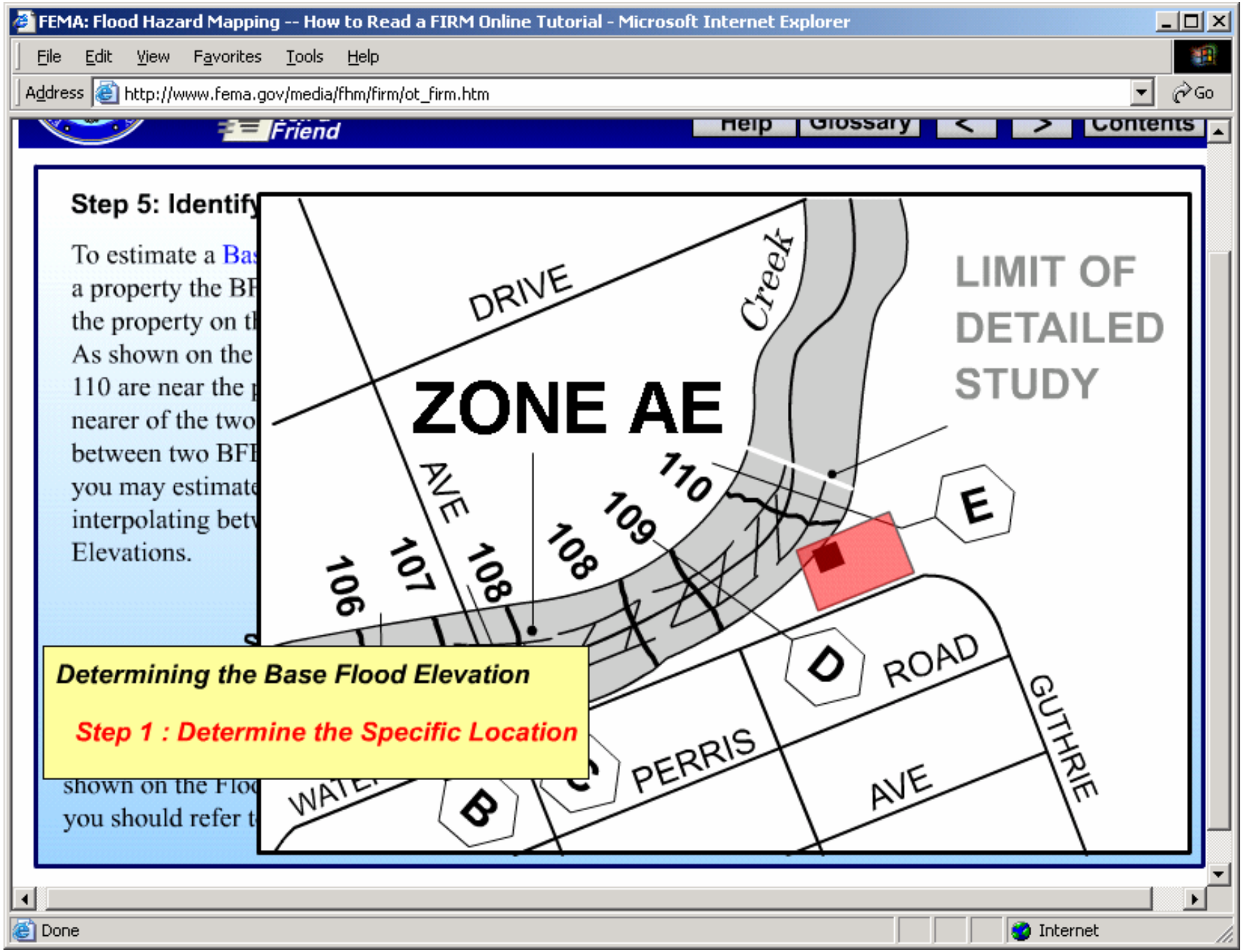


For an accurate elevation number, you refer to the flood profiles for the flooding source that appear in the Flood Insurance Study (FIS) report the for associated stream. However, the BFEs shown on the Flood Map are only accurate to plus or minus a half foot. For an accurate BFE, you should refer to the Flood Profiles or Flood Elevation Tables in the FIS report.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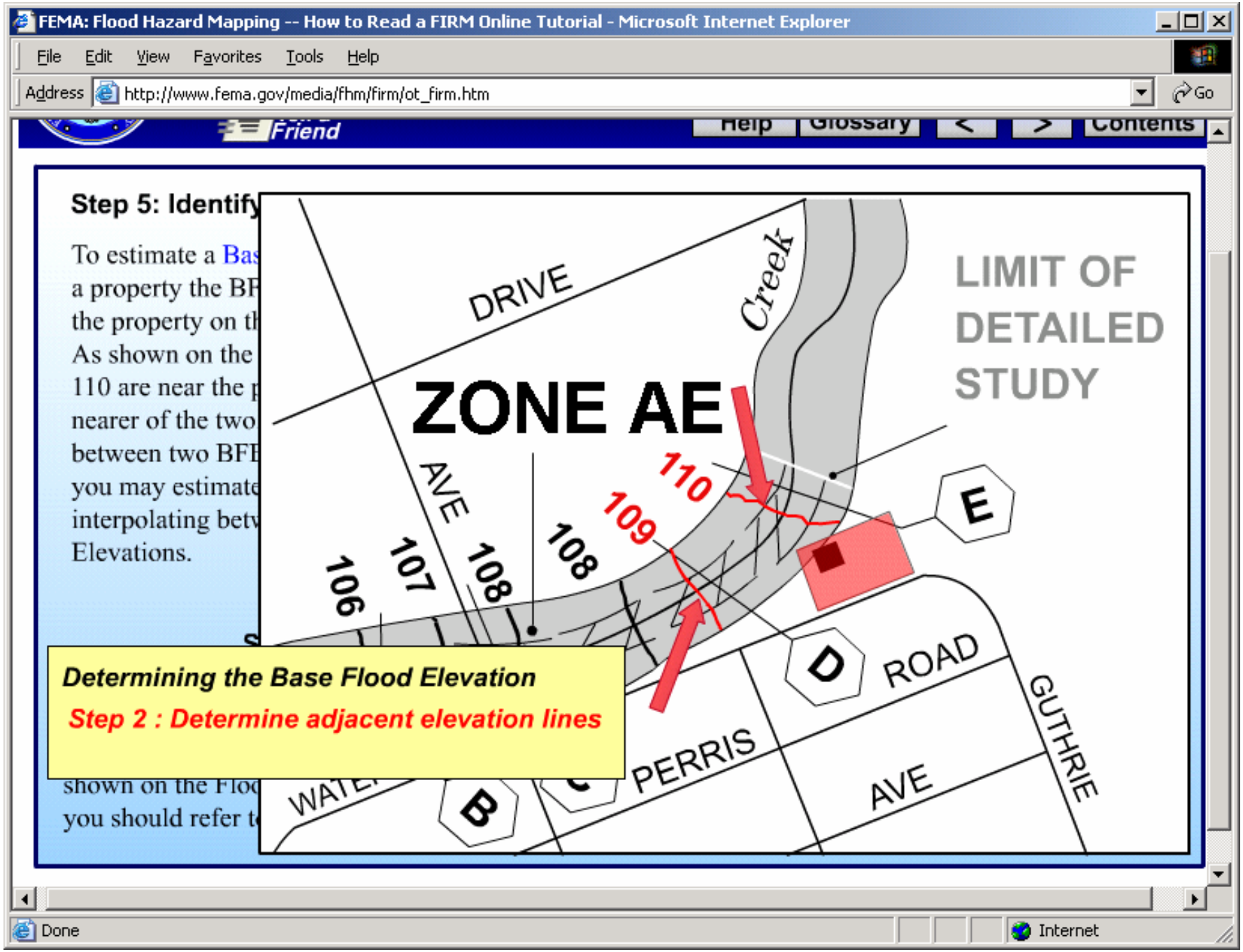
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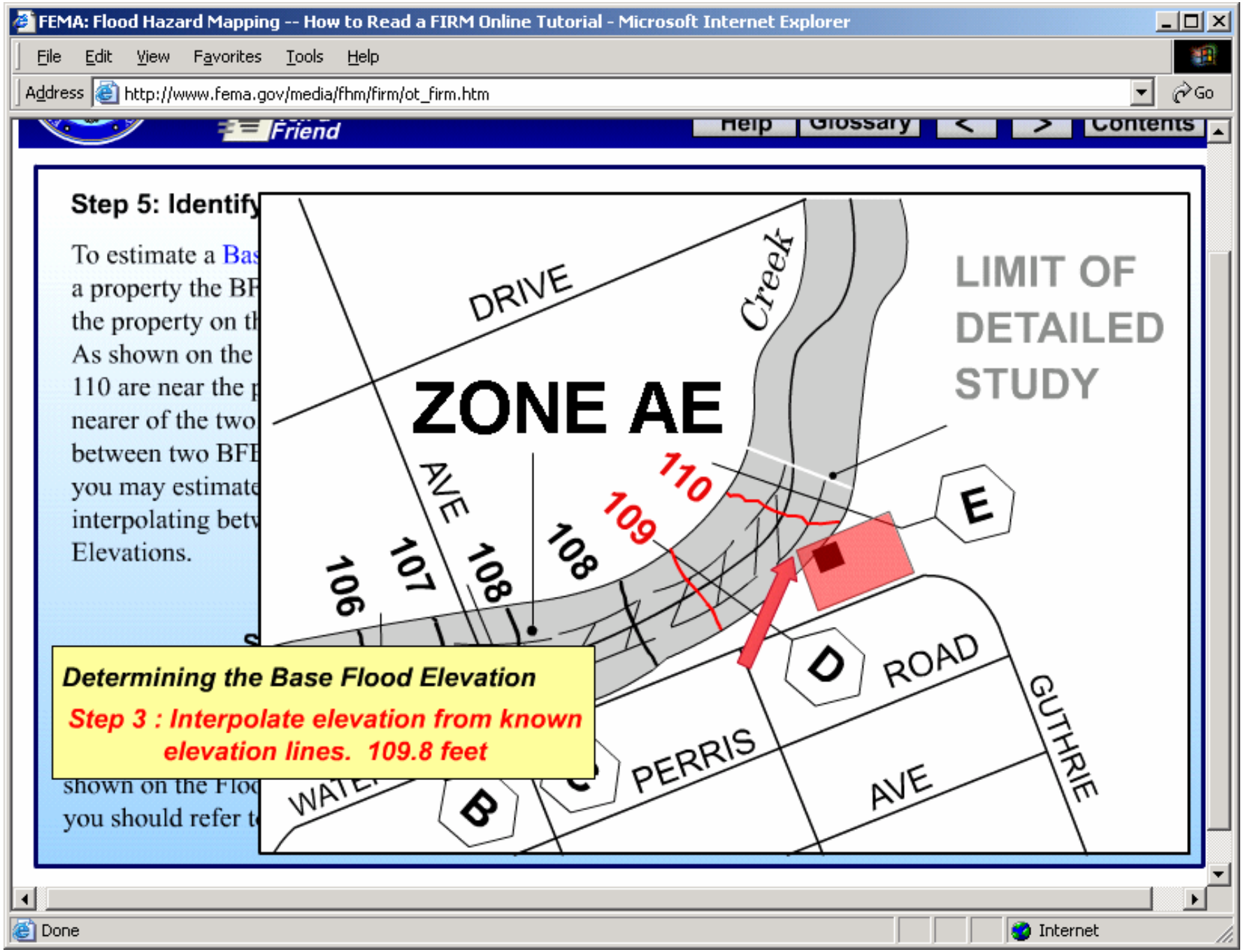
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Step 5: Identify The Base Flood Elevation At The Property

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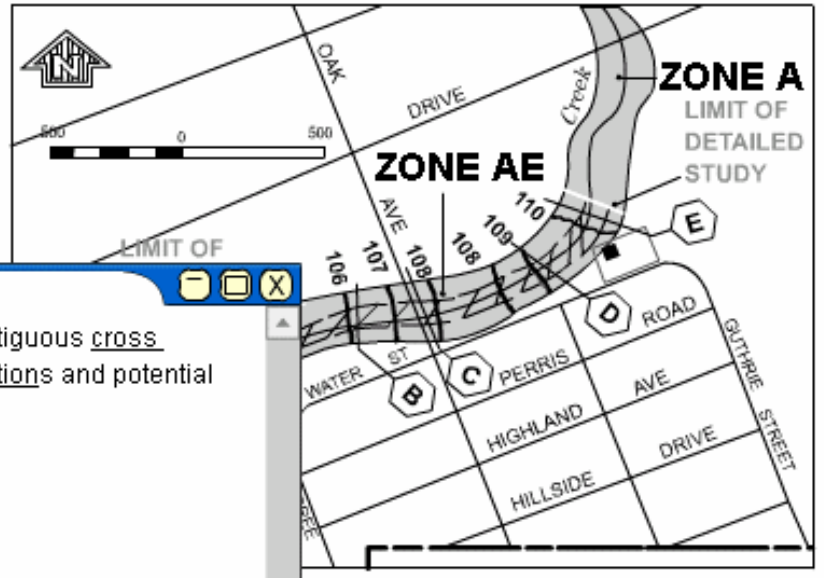

Flood Profile
A cross-sectional drawing showing the contiguous cross sections along a stream, with ground elevations and potential flood elevations plotted.

For an accurate elevation number, you refer to the flood profiles for the flooding source that appear in the Flood Insurance Study (FIS) report the for associated stream. However, the BFEs shown on the Flood Map are only accurate to plus or minus a half foot. For an accurate BFE, you should refer to the Flood Profiles or Flood Elevation Tables in the FIS report.

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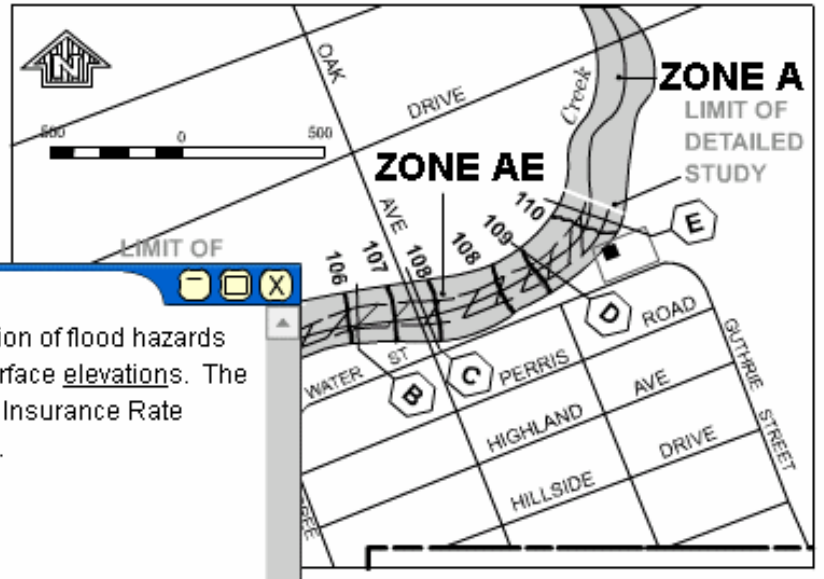

Flood Insurance Study (FIS)
An examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water-surface elevations. The resulting reports are used to develop Flood Insurance Rate Maps. Also know as a flood elevation study.

For an accurate elevation number, you refer to the flood profiles for the flooding source that appear in the Flood Insurance Study (FIS) report the for associated stream. However, the BFEs shown on the Flood Map are only accurate to plus or minus a half foot. For an accurate BFE, you should refer to the Flood Profiles or Flood Elevation Tables in the FIS report.

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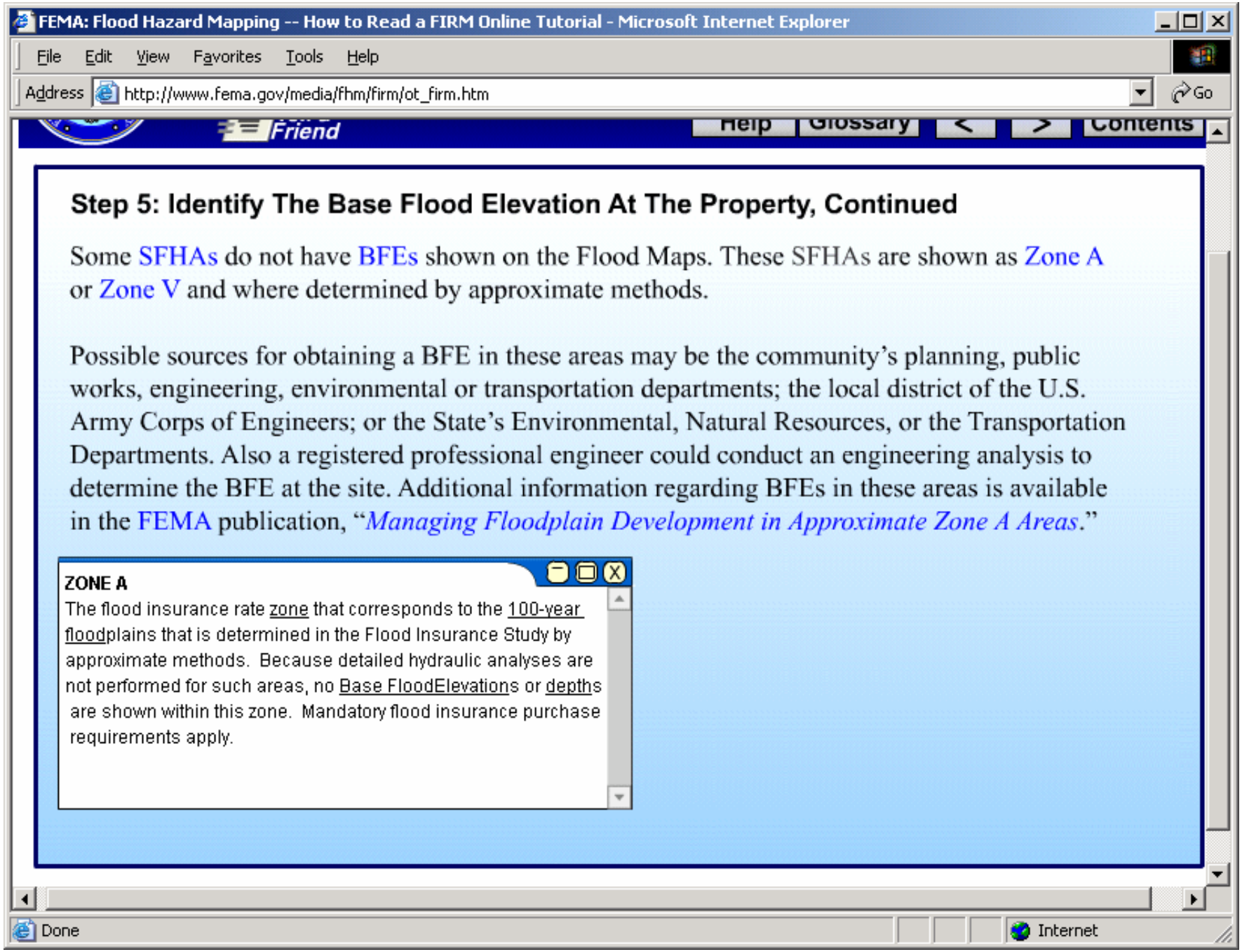
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Step 5: Identify The Base Flood Elevation At The Property, Continued
Some SFHAs do not have BFEs shown on the Flood Maps. These SFHAs are shown as Zone A or Zone V and where determined by approximate methods.
Possible sources for obtaining a BFE in these areas may be the community's planning, public works, engineering, environmental or transportation departments; the local district of the U.S. Army Corps of Engineers; or the State's Environmental, Natural Resources, or the Transportation Departments. Also a registered professional engineer could conduct an engineering analysis to determine the BFE at the site. Additional information regarding BFEs in these areas is available in the FEMA publication, "Managing Floodplain Development in Approximate Zone A Areas."
ZONE A
The flood insurance rate zone that corresponds to the 100-year floodplains that is determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base FloodElevations or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.
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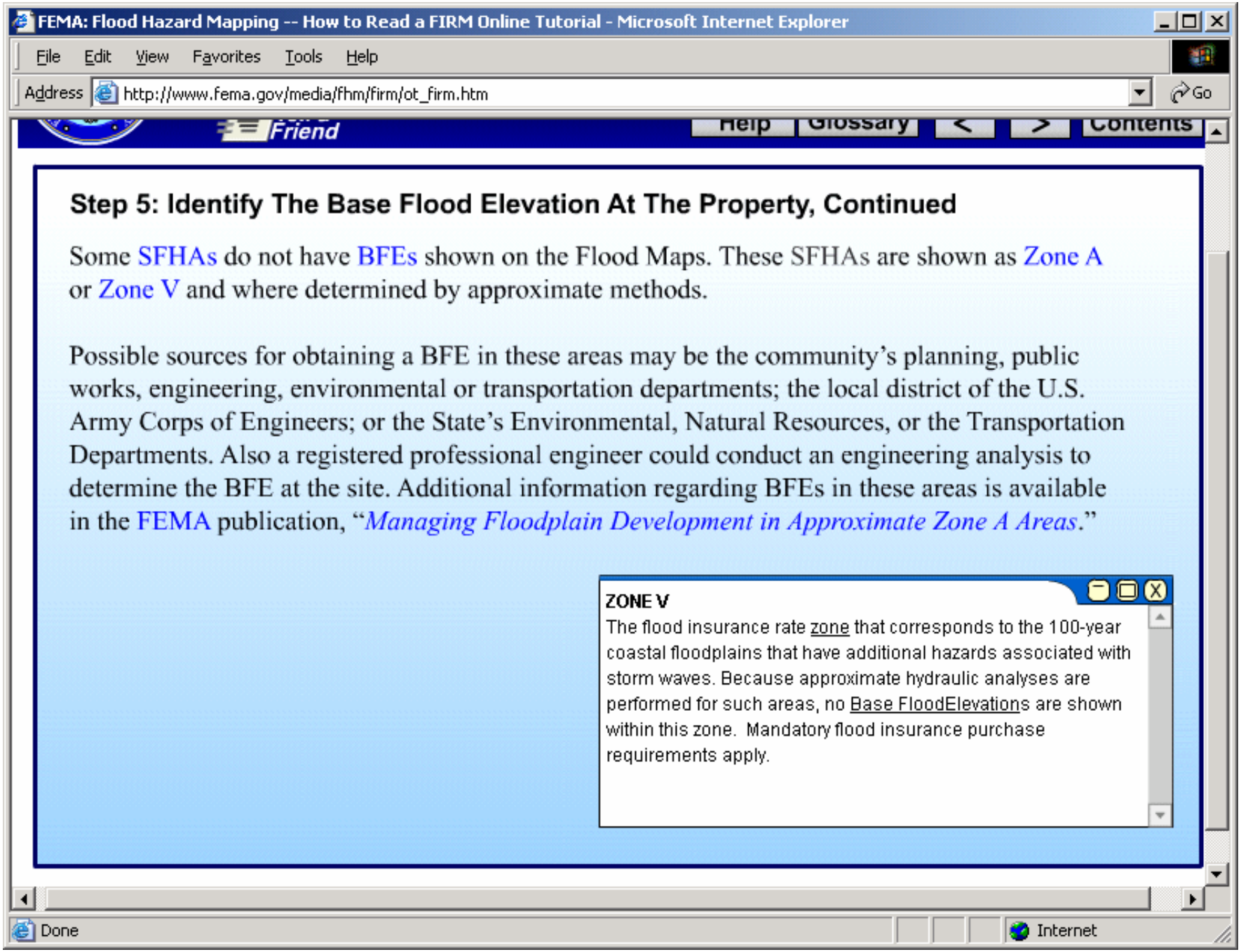

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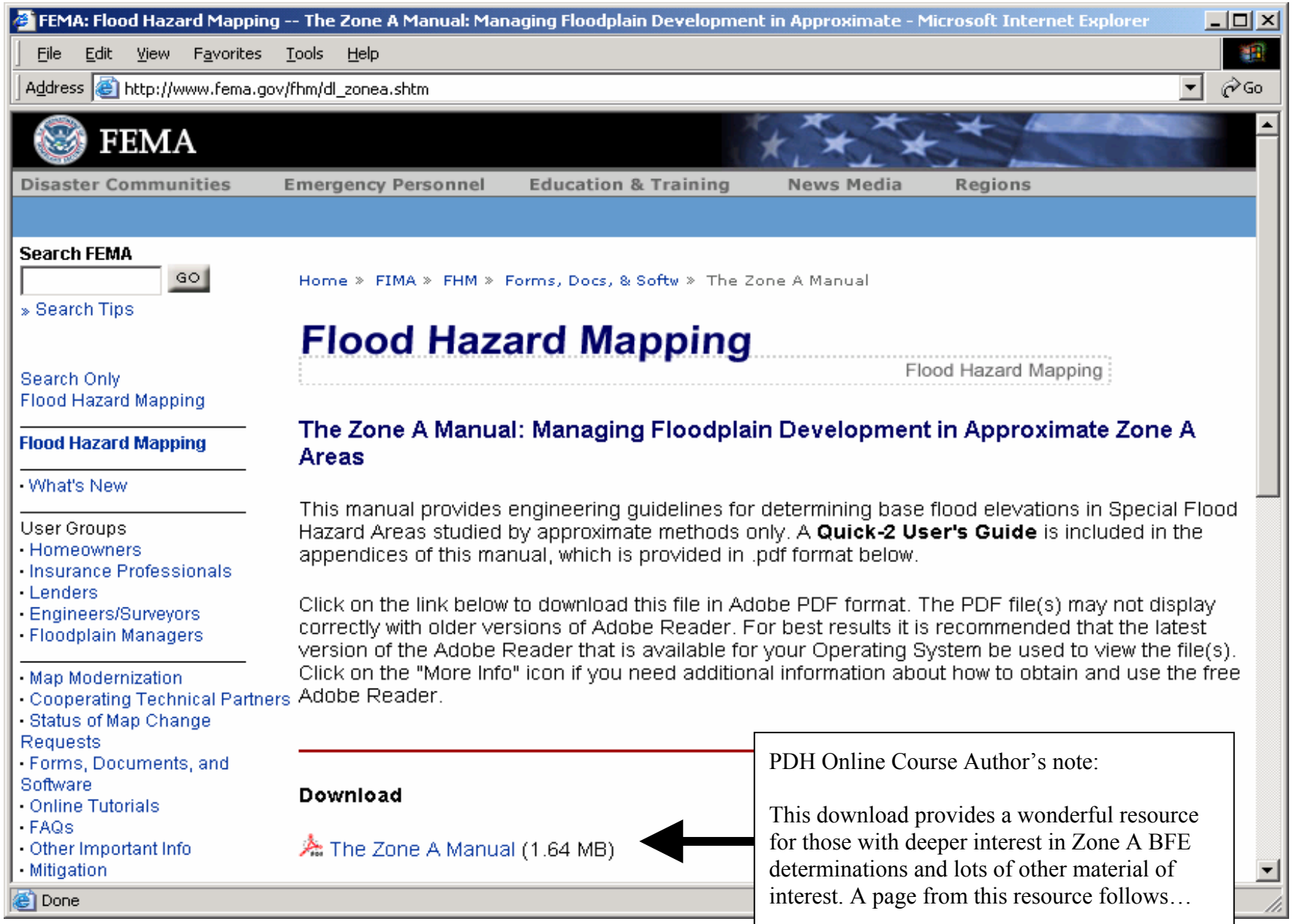


PDH Online Course Author's note:

This download provides a wonderful resource for those with deeper interest in Zone A BFE determinations and lots of other material of interest. A page from this resource follows…

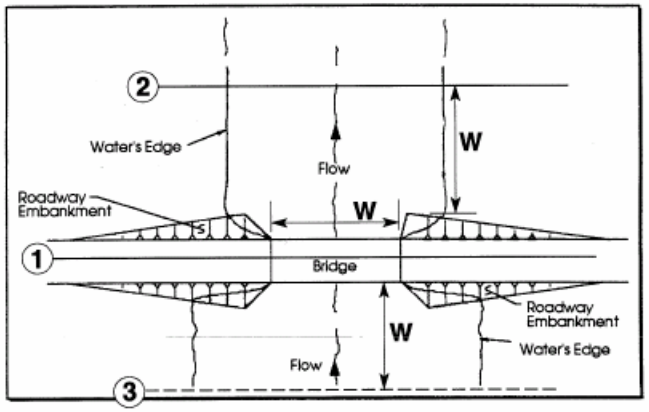


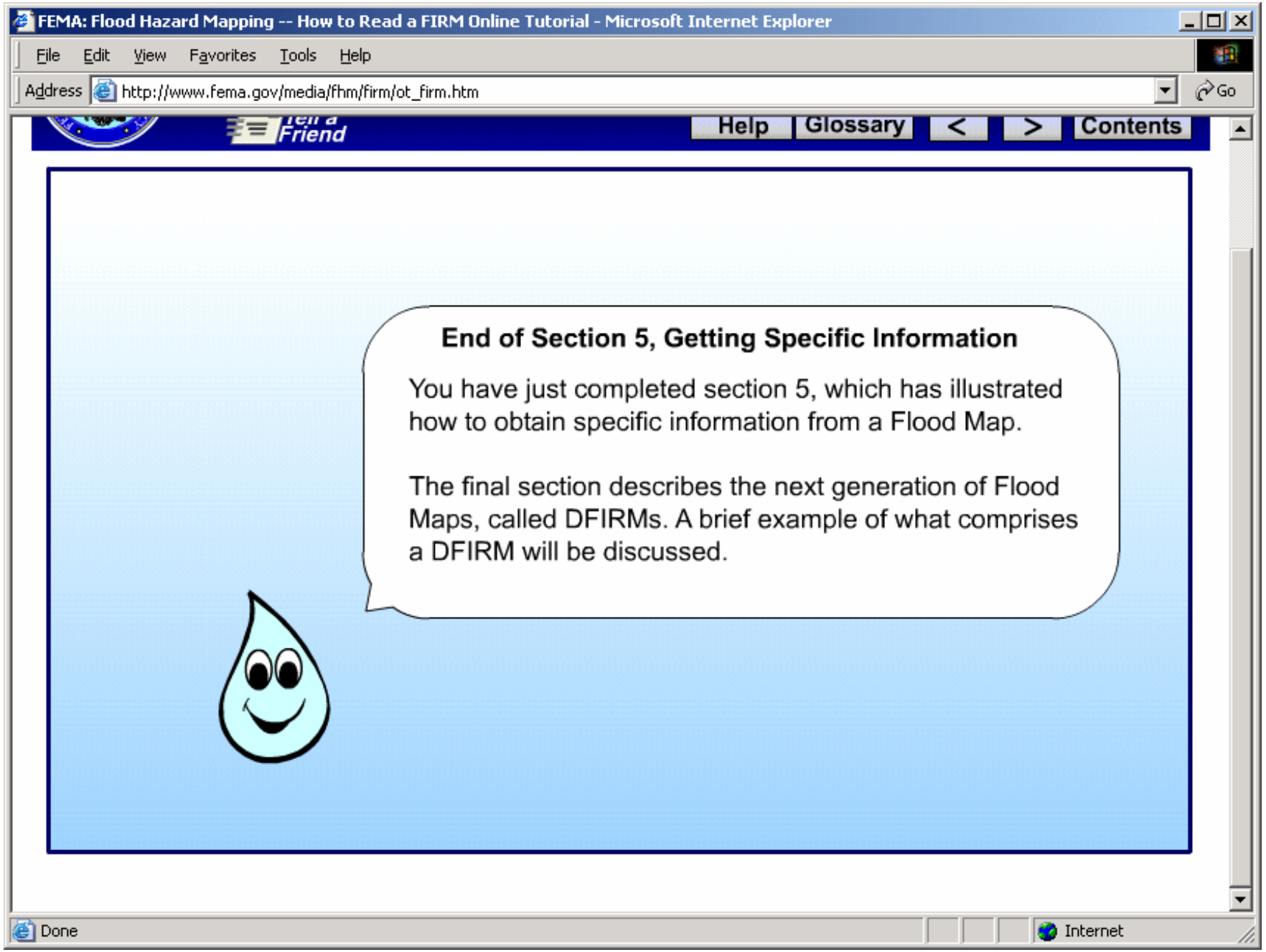
Figure 18 - Cross Section Locations at Structures

If the floodplain configurations upstream and downstream of the structure are different and the structure is a bridge, an additional cross section should be used upstream of the structure. The cross section should be located at a distance equal to the width of the structure opening upstream of the structure as measured from the foot of the embankment or wing walls.

The stations and elevations for cross section ground points outside of the stream channel may be obtained from a topographic map. The size of the structure opening, piers, and channel geometry, however, should be obtained by field survey.

Hydrology

There are a number of methodologies that may be used to develop flood discharges for approximate Zone A areas. The methods discussed below were selected because they are fairly simple to use, require information that is easily obtainable, and provide reasonable discharge estimates for streams where more detailed hydrologic analyses have not been performed. These methods, which have been ordered based on ease of use and expected level of accuracy, include discharge-drainage area relationships, regression equations, the NRCS TR-55 graphical peak discharge and tabular hydrograph methods,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Contents
End of Section 5, Getting Specific Information
You have just completed section 5, which has illustrated how to obtain specific information from a Flood Map.
The final section describes the next generation of Flood Maps, called DFIRMs. A brief example of what comprises a DFIRM will be discussed.
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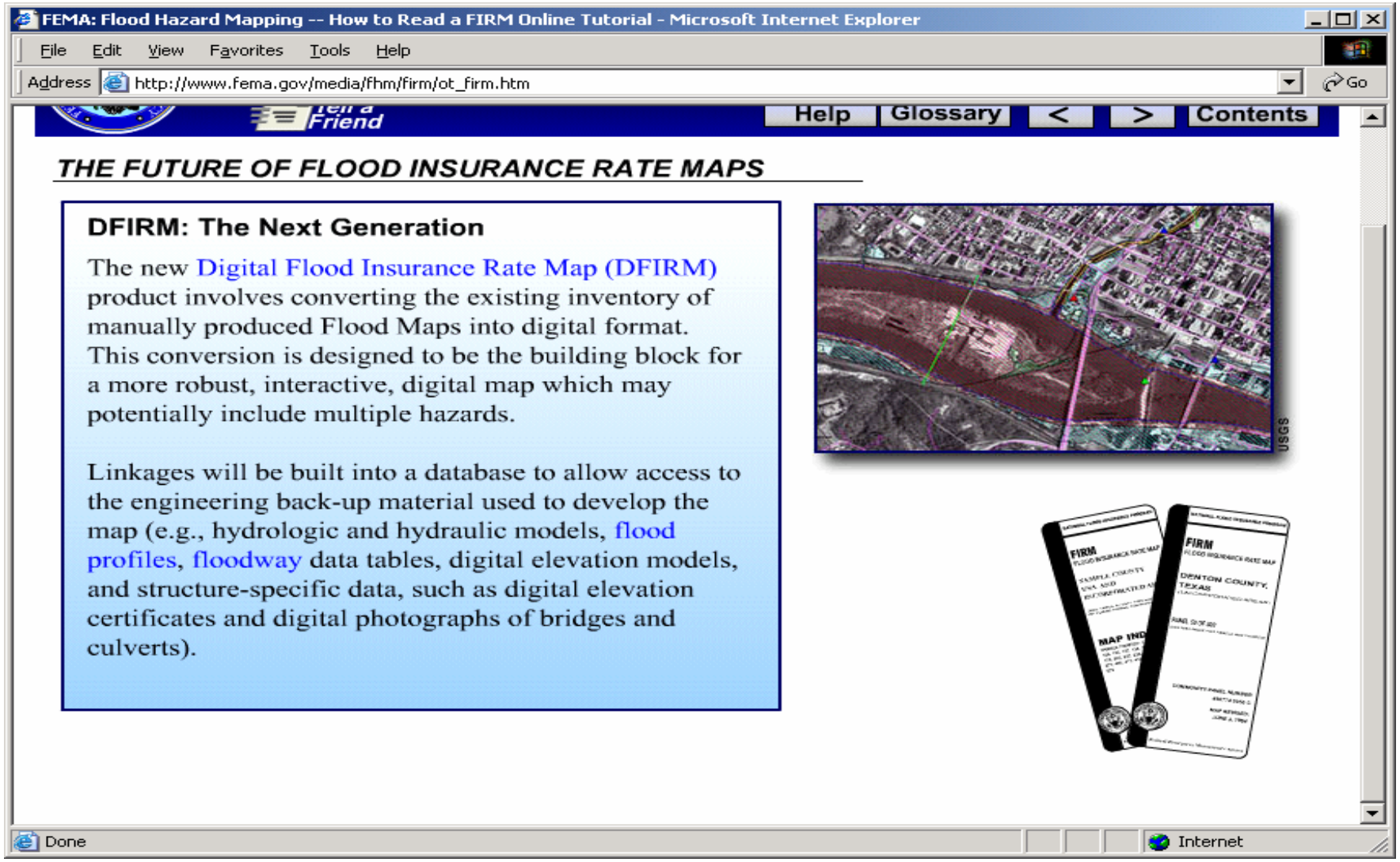
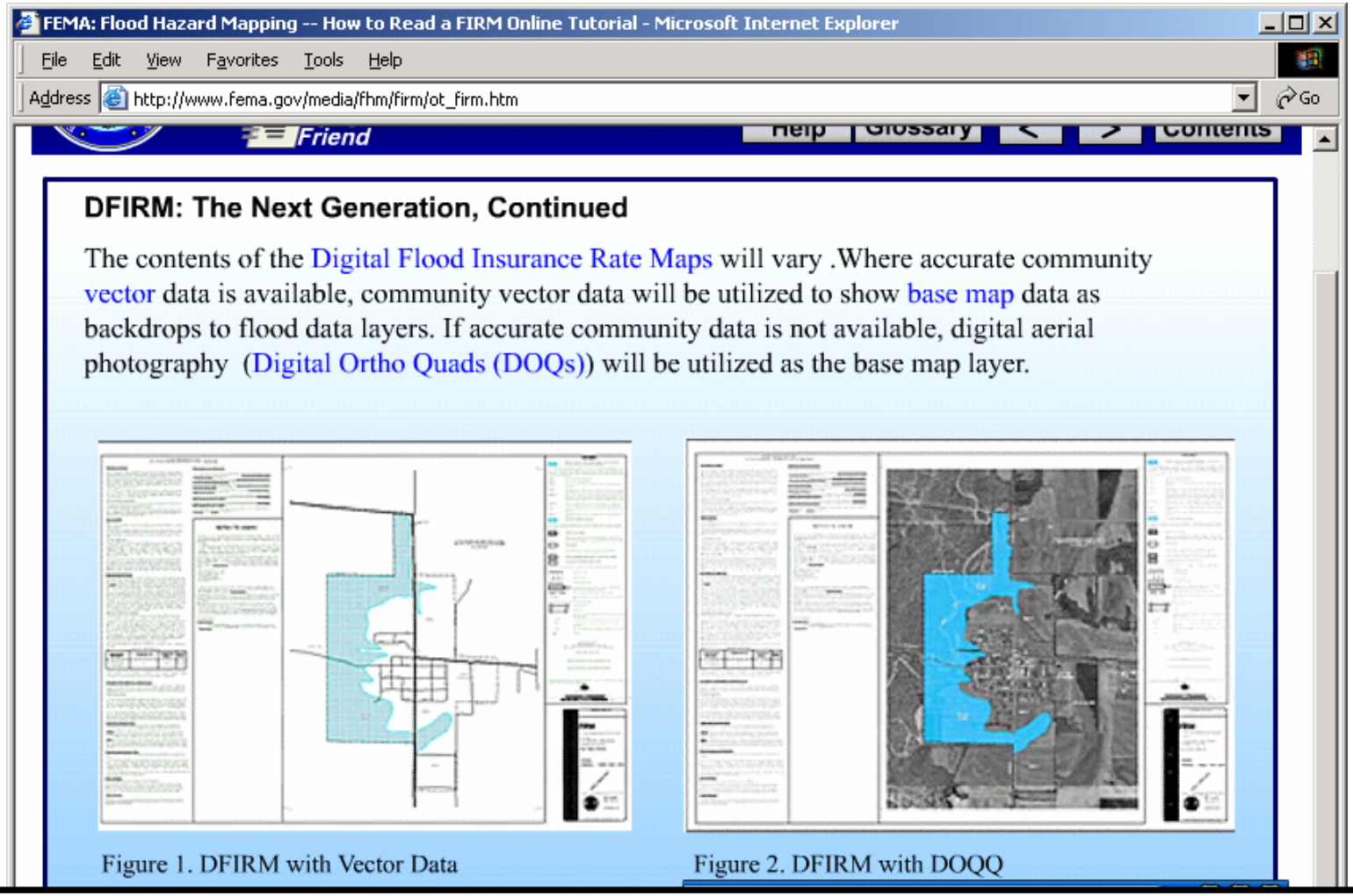
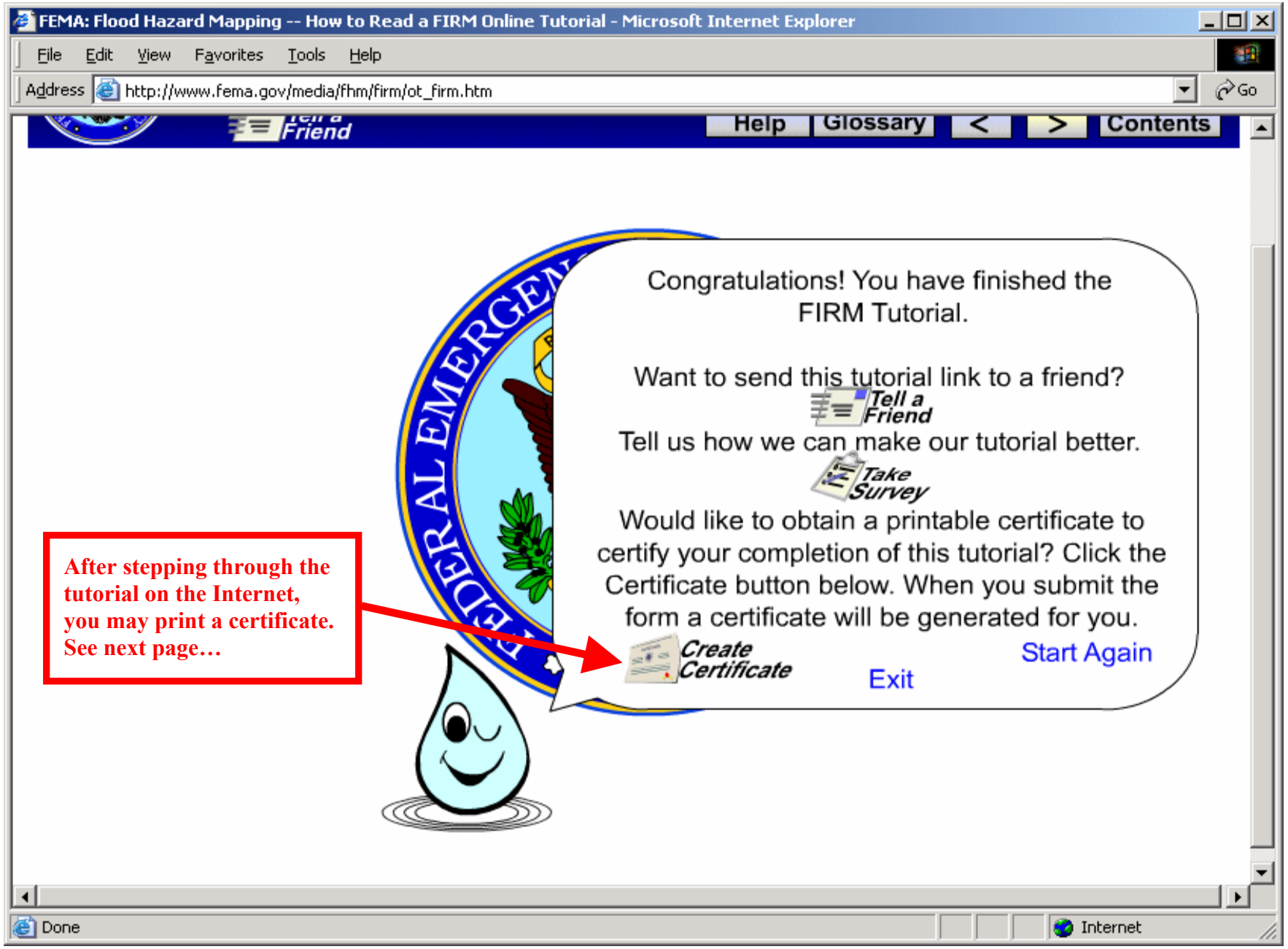


As part of FEMA's Map Modernization Objectives, a new Digital Flood Insurance Rate Map (DFIRM) product is being developed. The new DFIRM product will include a spacial database with options that can be invoked depending on the available data. The DFIRM spacial database will include certain standard features and meet minimum mapping requirements. Additional enhancements will be included depending on community needs, available data, and funding. A review of needs and available data will lead to recommendations concerning which options to exercise.



Digital Orthophoto Quadrangle (DOQ)

Base map data supplied by communities or other non-Federal sources (e.g., State or regional agencies) that meet FEMA criteria will be the first choice for new DFIRM production. Digital Orthophoto Quarter Quadrangles (DOQs) produced by the U.S. and in the is a Geological Survey (USGS) will be the second choice and the default map base if suitable community data are not available. If neither suitable community base map data nor USGS DOQs are available for county scheduled for a new DFIRM production, FEMA will provide the community with information on base map sources, including information on partnering with USGS to initiate DOQ production for that county.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Would like to obtain a printable certificate to certify your completion of this tutorial? Click the Certificate button below. When you submit the form a certificate will be generated for you.
Create Certificate
Start Again
Exit
After stepping through the tutorial on the Internet, you may print a certificate. See next page…
Done
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On the left is a sample of the good-looking certificate that you can print out at the end of the tutorial on FEMA's web site.

GLOSSARY SECTION

Definitions below are from the FEMA FIRM tutorial's, "Glossary" pull-down menu.

They are listed for your convenience in alphabetical order:

1-percent annual chance floodplain
This is the boundary of the flood that has a 1-percent chance of being equaled or exceeded in any given year. Also known as, "the 100-year floodplain."

1-percent annual chance water-surface elevation
The height, in relation to the National Geodetic Vertical Datum of 1929 (or other datum, where specified), of the flood having a 1-percent chance of being equaled or exceeded in any given flood year (also known as, "the 100-year flood" or "the base flood").

100-year flood
the flood having a 1-percent chance of being equaled or exceeded in any given year, also known as the base flood. The 1-percent annual chance flood, which is the standard used by most Federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a flood hazard area shown on an NFIP map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

100-year floodplain
This is the boundary of the flood that has a 1-percent chance of being equaled or exceeded in any given year. Officially termed "the 1-percent annual chance floodplain."

500-year floodplain
This is the boundary of the flood that has a 0.2-percent chance of being equaled or exceeded in any given year. Officially termed "the 0.2-percent annual chance floodplain."

Backwater
The affected downstream flow on the water-surface profile.

Base Flood
The flood having a 1-percent chance of being equaled or exceeded in any given year, also known as the 100-year flood. The base flood, which is the standard used by most Federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a special flood hazard area on a NFIP map has a 26-percent chance of suffering flood damage during the term of a 30-year mortgage.

Base Flood Elevation (BFE)
The height of the base flood usually in feet, in relation to the National Geodetic Vertical Datum of 1929, the North American Vertical Datum of 1988, or other datum referenced in the Flood Insurance Study report, or depth of the base flood, usually in feet, above the ground surface.

Channel Bank Stations
Points that identify the extreme limits of the natural stream channel. These stations are typically assigned at locations along a cross-section where a relatively flat area exists outside of the channel

Critical Depth
The depth of flow at which, for a given discharge at a given location, the total energy is the minimum value possible for flow to occur.

Cross Section
A line developed from topographic information across a floodplain at which a computation of flood flow has been made to establish a potential flood elevation. Cross-sections are shown on the Flood Boundary Floodway Map, Flood Insurance Rate Map, and-or Flood Profiles of a Flood Insurance Study.

Cubic feet per second (cfs)
Typical units used to express the rate of flow of surface water in open channels. One cf is approximately equal to 7.5 gallons per second.

Datum
A fixed starting point of a scale.

Depth
Maximum depth of water in the cross-section as measured below the water-surface elevation.

Digital Flood Insurance Rate Map (DFIRM)
as part of FEMA's Map Modernization Objectives, a new Digital Flood Insurance Rate Map (DFIRM) product is being developed. The new DFIRM product will include a spatial database with options that can be invoked depending on the available data. The DFIRM spatial database will include certain standard features and meet minimum mapping requirements. Additional enhancements will be included depending on community needs, available data, and funding. A review of needs and available data will lead to recommendations concerning which options to exercise.

Discharge
The volume of water that passes a given location within a given period of time. Usually expressed in cubic feet per second (cfs).

Federal Emergency Management Agency (FEMA)
An independent agency of the Federal government, founded in 1979, which reports directly to the President. FEMA is responsible for identifying and mitigating natural and man-made hazards. The agency's mission is:

> *To reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response, and recovery.*

Flood (also Flooding)
A general and temporary condition of partial or complete inundation of normally dry land areas. For flood insurance claim purposes, two or more structures must be inundated before flood damage will be covered

Flood Boundary Floodway Map (FBFM)
A pre-Map Initiatives floodplain management map that delineates the 100-year (1 percent annual chance) and 500-year (0.2 percent annual chance) floodplains, floodway, and cross sections.

Flood Insurance Rate Map (FIRM)
A map on which the 100-year (1% annual chance) and the 500-year (0.2% annual chance) floodplains, Base Flood Elevations, and risk premium zones (and floodway information on Map Initiatives FIRMs) are delineated to enable insurance agents to issue an accurate flood insurance policies to homeowners in communities participating in the National Flood Insurance Program.

Flood Insurance Study (FIS)
An examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water-surface elevations. The resulting reports are used to develop Flood Insurance Rate Maps. Also known as a flood elevation study.

Flood Profile
A cross-sectional drawing showing the contiguous cross-sections along a stream, with ground elevations and potential flood elevations plotted.

Floodplain or Flood-Prone Area
Any land area susceptible to inundation by water from any source.

Floodplain Management
The operation of the program of corrective and preventive measures for mitigating flood damage, including, but not limited to, emergency preparedness plans, flood-control works, and floodplain management regulations.

Floodway
Channel of the stream plus any adjacent floodplain areas that must be kept free of encroachment so that a 100-year flood discharge can be conveyed without increasing the elevation of the 100-year flood by more than a specified amount (1 foot in most states).

HEC-2
A step backwater program developed by the US Army Corps of Engineers Hydrologic Engineering Center for use in calculating water-surface profiles for steady, gradually varied flow in natural or man-made channels.

Hydraulic Radius
Equal to (Area of cross section / Wetted Perimeter)

Mannings "n" Roughness Coefficient
Coefficient used to account for the friction caused by friction, vegetative, and/or man-made surfaces within a floodplain cross-section. The coefficient, n, is commonly used to represent flow resistance for hydraulic computations of flow and open channels. The procedure for selecting n values is subjective and requires judgment and skill that is developed primarily through experience. The expertise necessary for proper selection of n values can be obtained in part by examining characteristics of channels that have known or verified roughness coefficients. A table of Manning n values is available from t;H; pull-down menu in the Quick-2 program.

Map Repository
The location where a community's flood maps are kept; usually the local zoning and planning office.

Maps Service Center (MSC)
The Maps Service Center (MSC) distributes National Flood Insurance Program (NFIP) products including: Digital Flood Insurance Rate Maps (DFIRM), Flood Insurance Rate Maps (FIRM), Flood Insurance Studies (FIS), Digital Q3 flood data, Community Status Book, Flood Map Status Information Service (FMSIS), and Letters of Map Change (LOMC).

National Flood Insurance Program (NFIP)
Federal insurance program under which flood-prone areas are identified and flood insurance is made available to residents of participating communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage.

Normal Depth
The depth expected for a stream when the flow is uniform, steady, one-dimensional, and is not affected by downstream obstructions or flow changes. This is the usual calculation that is utilized to determine Base Flood Elevations for property or structures in approximate Zone A areas.

Overbank
The area of the cross section that is found outside of the channel bank stations on either side of the stream channel.

Peak Discharge
The peak volume of water that passes a given location within a given period of time. Usually expressed in cubic feet per second (cfs).

Perpendicular to Flow Path
Cross section should be plotted so that they are oriented in a manner that is perpendicular to the flow Path. Plotting cross-sections in this manner requires that the user examine the topography to determine the direction in which the water is most likely to flow in relation to different points along the proposed cross-section line. Typically, this can be achieved by ensuring that the cross-section line crosses each contour on the topographic map at or near a 90° angle.

Rating Curve
a curve showing the relationship between depth of flow and the discharge of a stream at a given location.

Regulatory Floodway
The channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Special Flood Hazard Area (SFHA)
Area inundated by the base (1-percent annual chance) flood, identified on the Flood Insurance Rate Map as Zones A, AE, AH, AO, AR, V, VE, or A99.

Station
A position where the horizontal distance from a user-established baseline is known.

Step-Backwater Analysis
Method used in Quick-2 (and other modeling programs) to analyze multiple cross-sections. Water-surface elevations are determined for all sections based on a given discharge. The initial water-surface elevation is automatically determined by the normal depth method or by a direct input of a water-surface elevation or depth.

Water-Surface Elevation
The height, in relation to the National Geodetic Vertical Datum of 1929 (or other datum, where specified) of floods of various magnitudes and frequencies in the identified floodplains of coastal or riverine areas.

Wetted Perimeter
Equal to (Area of cross-section / Wetted Perimeter)

Zone A
The flood insurance rate zone that corresponds to the 100-your floodplains that is determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

Zone A99
The flood insurance rate zone that corresponds to areas of the 100-year floodplains that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No Base Flood Elevations or depths are shown within the zone. Mandatory flood insurance purchase requirements apply.

Zone AE
[Note: In the tutorial, the following definition for Zone AE is accessed through clicking a link titled, "Zone AE and A1-A30.]
The flood insurance rate zone that corresponds to the 100-year floodplains that is determined in the Flood Insurance Study by detailed methods. In most instances, Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone AH
The flood insurance rate zone that corresponds to the areas of the 100-year shallow flooding with a constant water-surface elevation (usually areas of ponding) where average depths are between 1 and 3 feet. The Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone AO
The flood insurance rate zone that corresponds to the area of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. The depth should be averaged along the cross-section and then along the direction of flow to determine the extent of the zone. Average flood depths derived from the detailed hydraulic analyses are shown within this zone. In addition, alluvial fan flood hazards are shown as Zone AO on the Flood Insurance Rate Map. Mandatory flood insurance purchase requirements apply.

Zone AR
The flood insurance rate zone that results from the decertification of a previously accepted flood protection system that is being restored to provide protection from the 100-year or greater flood event.

Zone D
Designation on National Flood Insurance Program maps used for areas where there are possible, but undetermined, flood hazards. In areas designated as Zone D, no analysis of flood hazards has been conducted. Mandatory flood insurance purchase requirements do not apply, but coverage is available. The flood insurance rates for properties in Zone D are commensurate with the uncertainty of the flood risk.

Zone V
The flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no Base Flood Elevations are shown within this zone. Mandatory flood insurance purchase requirements apply.

Zone VE
the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone X
[Note: The tutorial's link for this definition says, "Zones B, C and X."] The flood insurance rate zone that corresponds to areas outside the 100-year floodplains, areas of 100 years sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-year flood by levees. No Base Flood Elevations or depths are shown within the zone.