UNIT 4:
USING NFIP STUDIES AND MAPS

In this unit

This unit covers how to use the materials introduced in Unit 3:

- How to find and use the data provided in a Flood Insurance St
- How to find a site on a flood map
- How to obtain flood elevations from a profile
- How to keep the maps and data up-to-date over the years

Materials needed for this Unit

- Flood Insurance Study, Flood County, USA, and Incorporated Areas
- Flood Insurance Rate Map, Flood County, USA, and Incorporated Areas
- Engineer's scale

Additional information can be found in *Answers to Questions about the National Flood Insurance Program*, questions 81 – 95.

CONTENTS

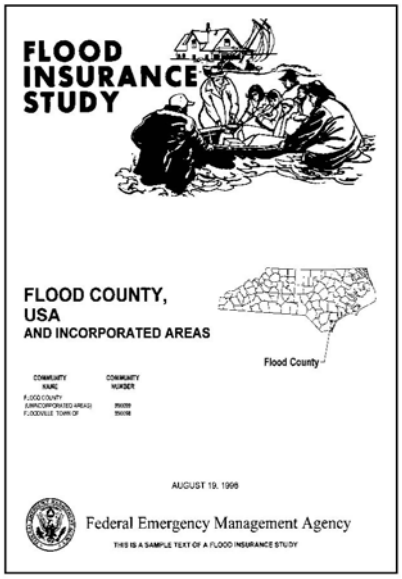
A. USING FIS REPORTS

The majority of Flood Insurance Study (FIS) reports use the same outline and numbering system. In this section, we will highlight the report's contents; explore the report's data, tables, and profiles; and describe how they are related to the Flood Insurance Rate Map (FIRM) and Floodway Map.

The most important reason for using a FIS report, in conjunction with a Floodway Map and/or a FIRM, is to determine whether or not a site is located in a Special Flood Hazard Area (SFHA), a V Zone, and/or a floodway, and to determine the Base Flood Elevation (BFE).

Important: Because the elevation determinations for riverine or coastal floodplains are typically used to establish flood elevations for construction in SFHAs and other purposes, accuracy is critical. You may want to have another person double check your determinations before using them in the permit application process.

FIS REPORT CONTENTS



The Flood County FIS report cover has an outline map. Note that the location of Flood County is pinpointed on the outline map. The date of the FIS and the community identification numbers are also indicated on the cover page.

Section 1.0 of all FIS reports states the purpose of the FIS, authority of and acknowledgments by its authors, and coordination steps taken during the preparation of the study.

Section 2.0 provides background information on the community, its flood problems, which areas were studied, and what flood protection measures are in effect.

Section 3.0 discusses the engineering methods used. Section 3.1 covers the hydrologic analysis — how much water will flow through the floodplain during peak floods. Section 3.2 describes the hydraulic analysis — how high the water will get. Development of this information was described in Unit 3.

Section 4.0 discusses how the flood map was prepared from flood data for floodplain management applications. Section 4.1 covers mapping the floodplain boundaries — where the water will go. If the study included a floodway determination, Section 4.2 describes the

floodway study and mapping. Section 4.0 also includes the Floodway Data Table. How to interpret and use these and other data is covered later in this unit.

Section 5.0 covers data related to flood insurance, some of which you will not need to use. This section can be a useful reference, as it describes the flood insurance zones identified on the map.

Completing the FIS report are the following four sections: Section 6.0, Flood Insurance Rate Map; Section 7.0, Other Studies; Section 8.0, Location of Data; and, Section 8.0, Bibliography and References.

Most riverine FIS reports include flood profiles as an exhibit at the end of the document. Coastal analyses include a map of transect locations and tables containing data relating the transects to the stillwater and base flood elevations. The Flood County FIS report has both.

USING FLOOD DATA AND TABLES

Flood discharges

Turn to Table 3, *Summary of Discharges*, in Section 3.1 on page 9 of the Flood County FIS report. An excerpt from that table is shown below (Figure 4-1*)*.

TABLE 3 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
COBB BROOK					
At the confluence with the Rocky River	4.2	560	910	1,080	1,550

Figure 4-1: Flood County, FIS Report Table 3 - Summary of Discharges

Figure 4-1 (*Table 3 – Summary of Discharges*) summarizes the peak amount of water discharge for various flood frequencies at locations within the study area. The hydrologic study procedures for arriving at these amounts were discussed in Unit 3, Section B. The sizes of the drainage areas (watersheds) contributing to the water runoff producing the floods are also shown in the table.

The 100-year flood discharge for Cobb Brook at its confluence with the Rocky River is 1,080 cubic feet per second (cfs). This means that during the peak of the base or 100-year flood 1,080 cubic feet of water will pass this point each second.

Those administering the local ordinance may never have a need for these data. They are, however, important in making subsequent calculations of flood elevations as part of the hydraulic engineering study.

Floodway Data Table

The Floodway Data Table in Section 4.2 of the FIS report presents data from the hydraulic analysis (Table 6, page 17 in the report). Part of this table is reproduced below (Figure 4-2).

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rocky River								
A	4,395	115	1,233	6.1	9.9	9.9	10.0	0.1
B	5,537	13	142	9.2	10.4	10.4	10.5	0.1
C	9,610	100	323	8.4	10.9	10.9	11.1	0.2
D	10,995	85	861	7.2	11.2	11.2	11.3	0.1
E	12,695	245	1,887	5.1	11.3	11.3	11.4	0.1
F	13,845	270	2,403	4.5	11.5	11.5	11.5	0.0
G	14,513	230	2,553	3.7	11.6	11.6	11.6	0.0
H	16,625	180	2,000	4.2	11.7	11.7	11.7	0.0

[1]Feet above county boundary

Figure 4-2: Flood County, USA, FIS Report Table 6 - Floodway Data

All numbers in the table are calculated at each floodplain cross section. The first two columns under “Flooding Source” identify the stream name and the cross sections used in the FIS, and the distance of the given cross section from some reference point, usually the mouth of the flooding source, a corporate limit, or a county boundary. The footnotes at the bottom of the Floodway Data Table identify this reference point.

The locations of these cross sections are shown on the accompanying FIRM and Flood Profile (unless otherwise indicated on the Floodway Data Table). Cross-section A of the Rocky River is approximately 500 feet below (or downstream of) Glebe Way. You can find cross-section A on FIRM panel 38. It is the line that crosses the Rocky River and has the letter “A” in a hexagon at each end.

Remember that a floodway’s width usually is not symmetrical; it varies with the topography at each cross section. The next three columns (“Floodway”) provide data at each cross section. At cross-section A, on the Rocky River, the floodway is 115 feet wide. This means that from the floodway boundary on one side of the stream of this cross section to the floodway boundary on the other side of the stream is 115 feet. This is useful for double-checking the width of the floodway portrayed on the FIRM.

Figure 4-3 is a representation of the description of cross-section A given in Table 6.

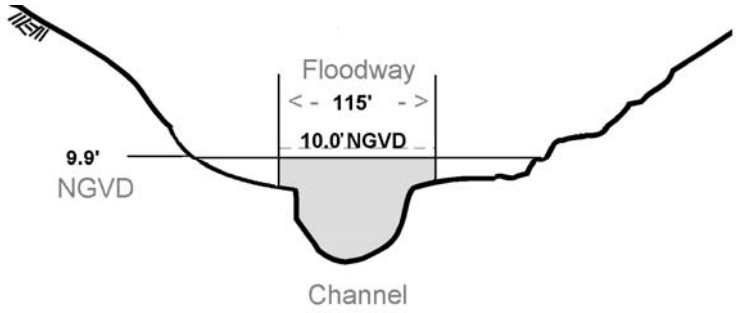


Figure 4-3: Representation of cross-section A of the Rocky River

The cross sectional area of the floodway here is 1,233 square feet. This is the cross sectional area of the floodway below the elevation of the base flood at this location (the shaded area of Figure 4-3). The average or mean velocity of the base flood in the floodway is 6.1 feet per second. This is an average velocity. Velocities will generally be higher in the channel than in the over bank areas.

Of the last four columns under "Base Flood Water Surface Elevation," you should be primarily concerned with the first one, "Regulatory," which provides the regulatory flood elevation. This is equivalent to the 100-year flood elevation or BFE. The other columns depict the increase in water-surface elevation if the floodplain is encroached upon so that the water-surface elevation is increased no more than 1 foot. This amount of encroachment is used to define the floodway width. Notice that no cross section has an increase of more than 1.0 foot, in accordance with NFIP standards. Some States and communities regulate to the "With Floodway" elevation to take into account possible future increases in flood stage that will occur as the floodplain is developed.

COASTAL AND LAKE ELEVATIONS

Coastal flood elevations. Table 4, *Transect Descriptions,* on page 12 in the FIS report for Flood County, shows the stillwater elevations and the maximum wave crest elevations of 100-year flood events along the coast.

Coastal regulatory flood elevations include the increase due to wave height. Therefore, use the BFE from the FIRM, not the stillwater elevations in the table.

The base flood elevations on the FIRM are rounded to the nearest foot, which means that if a base flood elevation was actually 8.3 feet, it would show as 8 feet on the FIRM. To correct for this, the recommended rule of thumb is to add 0.4 foot to the rounded BFE on the FIRM. This makes sure that the regulatory elevation you use will be high enough.

For the coast, use the base flood elevation from the FIRM (plus 0.4 foot), not the table.

Lake flood elevations. On inland lakes and reservoirs, the FIS generally does not include the effects of waves. For these areas, information on base flood elevations is contained in Section 3.0 of the FIS report, and data is presented in a table titled *Summary of Stillwater Elevations*. Note that in this table the BFE is shown to the nearest one-tenth of a foot, but the BFE shown in parentheses on the FIRM is rounded to the nearest *whole* number (Figure 3-13).

For lakes and reservoirs, *use the base flood elevation from the table, not the FIRM.*

RELATING REPORT DATA TO MAPS AND PROFILES

Unit 3 described the data that are developed and used in preparing an FIS for a community. Each set of data is used for calculations needed to produce additional data for the FIS.

The data contained in the FIS report are consistent with those found on the accompanying profiles and FIRM. For example, the base flood water-surface elevations at each identified cross section can be found in the Floodway Data Table, read from the flood profiles, and interpolated from the FIRM. Within the limits of map accuracy, you should obtain the same answer regardless of which source you use.

In the same way, the distances between cross sections, or their distance from some reference, can be found using any or all of the above data sources. Again, the answers should be about the same.

The elevations of the computed profiles contained in the FIS report are used with ground elevation data to determine the limits of the various zones shown on the FIRM. Again, flood elevations can be determined at any location along the studied stream using either the flood profiles or the FIRM. All the data fit one another. If obvious mistakes are found, please advise the FEMA Regional Office.

Note: Due to the limited detail and large scale of the base maps used for most FIRMs, much interpolation between contour lines is done in mapping the floodplain boundaries. This is why you may find discrepancies when actual ground elevations are surveyed: the maps are just the best available graphic representations of the BFEs.

Here's the order of precedence for identifying the BFE at a particular location:

- The most accurate BFEs are found in the Floodway Data Table (for a riverine floodplain) and the Summary of Stillwater Elevations table (for a lake). These BFEs

are listed to 0.1 foot. However, the Floodway Data Table is only good for sites on or next to a cross section.

- The next most accurate source of elevation data is the profile. This plot of the cross-section data is difficult to read accurately.
- The least accurate source of elevation data for a riverine floodplain is the FIRM. BFEs are rounded to the nearest whole foot. However, the FIRM is the only source of base flood elevations for coastal floodplains and AO and AH Zones.

BFEs take precedence if there is a dispute between the BFE and the boundaries of the SFHA shown on the maps. As a local permit administrator, you can make your decisions based on the most accurate source of data.

It must be noted that banks (and others who must read the FIRM to determine if flood insurance is required) must go by the map. They cannot make on-site interpretations based on data other than the FIRM. However, they may recommend that the property owner submit a request for a Letter of Map Revision based on Fill (LOMR-F) or a Letter of Map Amendment (LOMA) so the map can be officially changed to reflect the more accurate data (see Unit 4, Section D).

Again, only FEMA can amend or correct the maps. Discrepancies should be brought to FEMA's attention through a request for a map change, such as a Letter of Map Amendment (LOMA) (see Section D in this unit).

Reading and using flood profiles, the last set of data contained in a Flood Insurance Study report, will be covered in Section C of this unit.

B. USING THE FLOOD MAPS

LOCATING A SITE

How easily you can locate a site on an NFIP map will depend on your familiarity with properties in the community and with the scale of the flood maps.

For our exercise purposes here, the general location of the sites are shown on the Flood County Map Index. The site is adjacent to the Rocky River, just downstream of the corporate limits of Floodville. (Remember to check your north arrow. The top of the map is not always north.)

To locate a site, follow these steps:

The steps for a site in Flood County are shown in italics. The general location of the sites are shown on the Flood County Map Index. Site A is close to Floodville Lake.

- If your community has more than one map panel, use the map index to determine which panel to use. Use map landmarks —highways, streets, or streams —to find the site on the index.

  The Map Index for Flood County shows the site adjacent to Floodville Lake on panel 38.

- Find the area containing Floodville Lake on the map panel. Be sure the map panel is the most recent one — compare its suffix letter with the suffix letter for that panel on the current Map Index. Remember, in many communities, panels will have different effective dates due to revisions that do not affect the whole community.

  Floodville Lake is shown at the top right side of panel 38.

- If there is an asterisk on the panel number, either no flood hazard has been identified in that area or it is entirely one flood zone and the panel was not printed.

  See panel 30 on the Map Index for Flood County as an example.

- Locate the site as accurately as possible. Use a detailed street or road map as well as the tax appraiser's plat map to identify the property boundaries, if necessary. You will probably have to obtain the distance on the ground between the site and one or more identifiable points, such as the centerline of a road or street, a bridge, or some other feature on the map. Locate these points on the flood map.

Site A is bounded to the north by Good Place, to the south by Kalef Lane, beginning 200 feet west of Barclay Lane and extending west for 200 feet.

- Convert the distance to the map scale and plot the site on the map.

  Flood County FIRM panel 38 has a scale of 1 inch = 500 feet. This means you should use the "50" scale on the engineer's scale provided with this course. Example: If you read a length of 5 on the scale, this would be equivalent to 500 feet on the map.

DETERMINING STATIONING

In order to identify the BFE at a development site, the stream stationing for the site must be determined. The stationing of a site will allow us to read the flood profiles. In some cases stationing may be referred to as mileage.

- Locate Site B on the Flood County FIRM that shows cross sections. Identify which labeled cross sections are nearest to your site, both upstream and downstream.

  Site B is near Glebe Way adjacent to the Rocky River. It is located approximately 100' south of the southern portion of Glebe Way and approximately 350' west of the intersection of Foley Drive and Chris Drive. Follow the steps in the previous discussion to locate this site on the Flood County FIRM.

- Check the map scale used for the panel. The scale is in the map legend or key.

  For Flood County panel 38 the map scale is 1 inch = 500 feet.

Use an engineer's scale to measure the distance along the stream from the site to the nearest cross section, *following all bends and curves of the stream.* It would be worthwhile to measure the distances to both cross sections to check accuracy.

Site B is approximately 650' downstream of cross-section B and approximately 300' upstream (north) of cross-section A, East of the Rocky River

.

- If the stationing is based on mileage, convert these distances to miles by dividing by 5,280. In the case of Flood County, the stationing is based on feet.

  When converting to miles, we lose a little accuracy. Rounding the numbers, our site is 0.12 mile downstream of cross-section B and 0.06 mile upstream of cross-section A.

Keep these numbers in mind; they will be used shortly. This approach will also work by measuring from another point that shows up on the profile, such as a bridge or confluence with another stream.

BASE FLOOD ELEVATIONS FROM MAPS

BFEs are shown on the FIRMs as whole numbers. For AE Zones, or coastal and lake floodplains, use the BFE printed in parentheses below the flood zone designation. *No interpolation is necessary*. The same holds true for AH Zones with whole number base flood elevations.

> *The base flood elevation for properties in the vicinity of the Rocky River at the confluence of Cobb Brook is 10 feet (NGVD or above mean sea level).*

For other numbered AE Zones, read the BFE from the nearest wavy "base flood elevation line." Refer to the map legend or key if you are unsure of the line markings.

> *For the Site B example, the base flood elevations on the FIRM, are marked "10," above and below the site. If the site fell between the base flood elevations of 10 and 11, such as the area north of Site B between Glebe Way and Martling Way along the Rocky River, we could interpolate to find a correct base flood elevation based on the distance of the site from the base flood elevation lines. We could also locate the site on the profile based on how far upstream or downstream it is from cross-section A or B. Lastly, we could chose the higher base flood elevation, (e.g., 11) to best ensure protection from flooding.*

Zone A areas indicate approximate floodplain boundaries. No detailed study has been performed to determine base flood elevations in these areas.

There are no base flood elevations in AO Zones with base flood depths. Instead, the equivalent flood protection level is the number of feet shown in parentheses after the "Zone AO." This is not an elevation above sea level, it is the depth of flooding measured above ground level. The zones are also described in the Flood County FIS report Section 5.0, page 18, *Insurance Applications.*

> *West of the intersection between Barclay Lane and Argyle Way on FIRM panel 38 is a small Zone AO (Depth 2 feet). The base flood elevation for a site in this zone would be two feet above the grade of any adjacent building.*

LOCATING THE FLOODWAY BOUNDARY

If the site is at a surveyed cross section, floodway width data from the Floodway Data Table may be used as a more accurate measure than field and map measurements. Remember that the width listed in the table is the distance from the floodway boundary on one side of the stream to the floodway boundary on the other side of the stream.

If the floodway width measured on the map at that site is at a cross section, the map should be used because it is the floodway officially adopted by the community. If there is a significant difference between the map width at the site and the closest cross section width in the Floodway Data Table, contact the FEMA Regional Office for an interpretation.

Most sites won't fall conveniently on a cross section, so here are the steps using the map as shown in the video:

- Locate Site C on the map and select the correct engineer's scale for the map scale.

  Site C is located between Floodville Lake and Barclay Lane on Flood County FIRM panel 38. It is approximately 1,130 feet upstream of Argyle Way, and approximately 230 feet east of the intersection of Good Place and Barclay Lane.

Using the engineer's scale, measure the distance from the floodway boundary to a nearby feature on the ground. For streets, use the center of the street, both on the map and on the ground.

  The floodway boundary is approximately 105 feet from the intersection of Barclay Lane and Good Place.

- If any portion of the building site, proposed grading, fill, bridge, or other obstruction is determined to be within the floodway, the floodway provisions of your ordinance also apply.
- Site C falls inside of the floodway.

C. USING PROFILES

As discussed in Unit 3, Section B, a flood profile is a graph of computed flood elevations at the floodplain cross sections. It can be used to determine elevations of floods of various frequencies at any location along the studied stream.

PROFILE FEATURES

Four flood levels are typically shown on the flood profile fold-out sheets at the back of the FIS report: the 10-, 50-, 100-, and 500-year (10%, 2%, 1%, and 0.2%) floods. Only the 100- year flood is used for compliance with NFIP standards; the others are useful for other floodplain management applications, such as septic system design and location, bridge and culvert design, urban stormwater management, selecting sites for critical facilities, and determining how frequently a site or facility will flood.

In addition to the flood elevation lines, FIS profile sheets contain:

- a plot of the stream bed elevation,
- the locations of the cross sections used in the FIS and shown on the FIRM (a letter within a hexagon),
- the locations of roads, and
- culverts and bridges (usually depicted as a large "I").

The data are plotted on a grid to facilitate their interpretation. With few exceptions, the large grid squares are one inch on each side and are divided into 10 squares in both directions. This grid pattern makes taking measurements much easier.

Refer to the profile for Cobb Brook at the back of the Flood County FIS report. The bottom, or x-axis, shows the distance along the river in feet upstream of the confluence with the Rocky River. For this profile, each large square is 200 feet and each little square is 20 feet.

The left side, or y-axis, shows the elevation in feet NGVD. Each large square represents 10 feet and each small square is 1.0 foot. Be aware that profiles in other FIS reports may have different scales.

Figure 4-5 shows a sample of the data that are plotted on the profile shown for Cobb Brook in Flood County. Before you look at it, measure the distance (in feet) and base flood elevations from the profile for cross-sections A, B, and C.

Cross section	Feet above confluence with Rocky River	100-Year Flood elevation
A	1,080	10.14
B	1,880	23.8
C	2,600	31.1

Figure 4-5: Plotted Data, Flood Profile 01P, Cobb Brook

DETERMINING BASE FLOOD ELEVATIONS

Profiles

Here are the steps to determine the BFE for a site using the flood profiles in the FIS report:

- Using the FIRM, locate features near the site that appear on the profile, such as a bridge or cross section.

  We'll work with the Rocky River profile at Site D, just south of the footbridge. The footbridge is located on Flood Profile 04P, at a point approximately 21,700 feet above the county boundary.

- Follow the stationing procedures described in the previous section to determine the site's distance from a cross section or other feature that appears on the profile.

  Site D is north of the Rocky River, approximately 850 feet upstream of cross-section J and approximately 3,600 feet downstream of cross-section K. The footbridge also appears on the profile.

- Find the feature(s) on the flood profile for that stream.

  The footbridge is located between cross-sections J and K. These cross sections are shown on Flood Profiles 04P and 05P at stream distances of 20,850 and 25,360.

- Check the scale used for the profile, and, using the engineer's scale, measure the distance from the feature(s) to the site.

You can use the "50" scale on the engineer's scale, or you can count squares. At this scale, each little square is 50 feet, so Site D is approximately 17 little squares upstream (right) of cross-section J.

- Find the site's location on the appropriate flood profile line and read the elevation on the y-axis. You can count squares or use the engineer's scale. Don't forget, the scale on the y-axis is different from the x-axis scale.

For the Rocky River profile, you may find it easiest to use the "50" scale on the y-axis because it is five feet to the inch.

- Find where the site intersects the profile. Draw a straight line to the left or right edge of the graph.

  The second line down is the base (100-year) flood profile. Read the flood elevation off either the left or right edge of the page. At Site D, the base flood elevation is 13.8 feet. Check the 10-, 50-, and 500- year elevations and see if you get: 11.3, 12.7 and 15.3, respectively.

  Note how this produces a more accurate number than interpolating between the two wavy lines on the FIRM. Instead of guessing the elevation of the site between the BFE lines, we can tell that it is 13.8

- A surveyor can establish the flood elevation at the site so the owner or builder will know how high the base flood elevation is predicted to be.

  A surveyor can either shoot 13.8 feet at the site or shoot any elevation and tell the owner how high the base flood is in relation to the mark.

Be sure to check each profile's scale before you use it. On Flood Profile 02P in the FIS report for Flood County, the x-axis scale is 1 inch = 500 feet and the y-axis scale is 1 inch = 5 feet. Flood Profile 01P covers steeper terrain and the y-axis is at a scale of (1 inch = 10) feet (each little square represents one foot).

Other types of floodplains

In coastal floodplains and areas of shallow flooding (AH or AO Zones), the base flood elevation or depth number is listed in parentheses below the zone designation on the FIRM. Use that elevation because there is no profile for these zones. Except for lake floodplains with stillwater elevation tables to 0.1 foot, the FIRM is the most accurate source for base flood elevations.

Relating flood elevations to the ground

If the site is clearly outside the boundary of the base floodplain, as with Site A, no floodplain regulations apply unless the site adjoins the SFHA and surveyed ground elevations are *below* the base flood elevation.

If it cannot be determined whether the site is in or out of the floodplain, additional information and/or investigation will be needed. In this instance, ground elevation and lowest floor elevations of any structures will be needed for the site, so one who wishes to apply for a

Letter of Map Amendment (LOMA) of Letter of Map Revision based on Fill (LOMR-F) may need to hire a surveyor.

A field visit by the local administrator or designee and measurements on the ground may also be required. The actual site elevations are compared to the base flood elevation, read from the FIS flood profiles, for that location.

If the site elevations are above the base flood elevation, the site is outside the floodplain and the applicant should be advised about the map amendment/revision process. If they are lower, it is within the floodplain and subject to the provisions of the ordinance.

It must be noted that banks (and others who must read the FIRM to determine if flood insurance is required) must go by the map. They cannot make on-site interpretations based on data other than the FIRM. However, they may recommend that the property owner submit a request for a LOMR-F or LOMA so the map can be officially changed to reflect the more accurate data (see Unit 4, Section D).

RELATING PROFILES TO MAPS

Base flood elevations shown on the FIRM are directly related to elevation data shown on the flood profiles. Within the limits of map accuracy, you should obtain the same elevation whether you use the map or profile.

However, the flood profiles should always be used to determine flood elevations along rivers and streams.

If you find obvious mistakes or discrepancies between the tables, profiles, and FIRM, contact the FEMA Regional Office.

From reading the profile in Section C of this Unit, Determining Base Flood Elevations, we determined the base flood elevation to be 13.8 feet. From reading the FIRM, we can only establish that the base flood elevation for Site D should be between 13 and 14 feet.

These computations show that the FIRM and the FIS report profile are consistent and provide a double check to make you comfortable with your determination.

D. MAINTAINING AND REVISING NFIP MAPS

NFIP maps are vital to effective enforcement of your floodplain management responsibilities. They are also key to accurate flood insurance rating and fair determinations of the flood insurance purchase requirement.

As the primary repository for NFIP maps, it is important that the community maintain adequate copies and keep them updated. You should have at least one master map that includes all the changes, annexations, map revisions, etc.

It is also important that you keep copies of old, revised maps. They provide a historical record of what was known and the basis of what was required in the past. For example, a property may not have been shown in the SFHA on an old FIRM, so there were no building requirements. If that property is later flooded, you will need to show the old map as the basis for the community's action.

Similarly, people who purchased flood insurance based on the FIRM zone in effect at the time are entitled to keep that FIRM zone as the basis for their rates. You will be doing your citizens a valuable service if you have a copy of an old FIRM.

ORDERING MAPS

Additional copies of your community's FIS report, FIRM, and Floodway Map can be ordered by calling **1-800-358-9616**. The toll-free map distribution center number is staffed Monday through Friday from 8 a.m. to 8 p.m. Eastern Standard Time.

Requests may be faxed to 1-800-358-9620, or mailed to:

Map Service Center
P.O. Box 1038
Jessup, MD 20794-1038

Maps are provided at no charge to local government officials. The FIS report and Floodway Maps must be specifically requested, or only the FIRMs will be sent.

Be prepared to give your Community Identification Number.

CHANGING NFIP MAPS

No map is perfect and no flood situation is static. From time to time, FEMA, communities, or individuals may find it necessary for a FIRM or Floodway Map to be updated, corrected, or changed.

Common reasons why a map may need to be changed include:

- **To correct non-flood-related features,** such as a change in the community's corporate limits. The local government should send the correct information to its FEMA Regional Office. However, the community does not need a new map if it has annexed an area that is shown on an adjacent community's FIRM. It can regulate floodplain development using that FIRM and flood data.
- Since it is expensive to reprint and redistribute flood maps, corporate boundary changes are usually made only when maps are revised for new or better flood data. One way to minimize the need for such changes is for a municipality to adopt the adjacent community's FIRM. This would clarify the regulatory flood data for newly annexed properties and areas in the community's extraterritorial jurisdiction.
- **To include better ground elevation data.** As noted earlier, maps do not always represent site-specific ground elevations. If there is better information on natural ground elevations, the applicant may apply to have the map reflect the better topographic information.
- **To reflect changes in ground elevations in the floodplain.** If there has been a substantial change in ground elevation — for example, fill has been placed in the floodplain to raise building sites above the base flood elevation — the applicant may request a map change to reflect the new ground information.
- **To revise flood data.** A request may be made to revise the existing study, based on a new flood study. The applicant must demonstrate that the original study was in error or that the new study is based on more accurate or better technical data.
- **To submit new flood data.** When a flood study is prepared for a development in an unnumbered A Zone, the data can be submitted to FEMA for later incorporation into the FIS or revised FIRM.
- **To reflect a flood control project.** If a new levee, reservoir, or channel modification affects the flow of the base flood, the community must request that the map be revised to reflect the new conditions or new (lower) base flood elevations. The map cannot be changed until the project is constructed and/or operating.

It is important to note that many small projects, such as channel clearing or retention basins in new subdivisions, do not have a measurable effect on the base flood and, therefore, do not warrant a map change. The request for a change needs to be carefully prepared by an engineer who knows FEMA's flood study guidelines.

It must be remembered that a community participating in the NFIP is obligated by its agreement with FEMA to submit new or revised map information when it becomes available. Section 65.3 of the NFIP regulations states:

> *A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a community shall notify [FEMA] of the changes by submitting technical or scientific data…*

Another point to keep in mind is that lenders, insurance agents, and communities must use the published flood maps. Lenders are affected by changes in a FIRM as they enforce the mandatory flood insurance purchase requirements. Communities are affected by changes in a FIRM and a Floodway Map as they enforce floodplain management regulations.

Consequently, uniform procedures have been established for requesting and administering map changes.

TYPES OF CHANGES

FEMA has four approaches to changing NFIP maps: restudies, limited map maintenance projects, amendments, and revisions. Requests for a restudy, amendment, or revision must be approved or made by the community, since they affect the local floodplain management program.

A ***restudy*** is a new Flood Insurance Study for some or all of the community. For example, FEMA may decide to conduct a restudy where development in a small watershed has substantially changed stormwater runoff conditions over the 15 or 20 years since the original FIS was completed. Or a restudy may be needed where growth is occurring along streams without base flood elevations.

A ***limited map maintenance project (LMMP)*** is a small-scale restudy that is limited in size and cost. It is frequently used for studies in unnumbered A Zones.

A ***map revision*** is used for other cases, including:

- scientifically based challenges to the flood elevations

- to incorporate new data that become effective after the construction of a flood control project
- to reflect fill placed in the floodplain after the flood study currently in effect was completed
- to change the floodplain or floodway boundaries
- to include new flood data

An ***amendment*** is used to remove an area that was inadvertently included in the SFHA. Often the ground is higher than depicted on the base map used for the FIRM. This typically happens because of the problem of accurately locating the floodplain boundary on a topographic map. For example, more detailed ground elevation data can be used to amend a FIRM to show a property that is higher than the BFE to be outside the SFHA.

FEMA will make map amendments based on the information submitted by the applicant. Unlike the three other types of changes, an amendment doesn't challenge the FIS or FIRM; it simply removes certain areas or buildings from the SFHA because they are higher than the base flood elevation.

MAPS AND LETTERS

FEMA uses two methods to make flood map changes.

The first is to actually change the map and publish new copies. Here the effective date of a map is changed. A restudy or limited map maintenance project will generally result in a new map. Sometimes revisions and amendments result in a reprinted map. However, republishing the map can be expensive and is done only if the change affects a large area.

The other method is to issue a letter that describes the map change. FEMA does this when the revision can be adequately described in writing or through use of a small, annotated map panel, such as when only one lot or building is affected.

There are two types of ***Letters of Map Change (LOMC)***: a ***Letter of Map Revision***, or ***LOMR***, and a ***Letter of Map Amendment***, or ***LOMA*** . The terms relate to the map changes described in the previous section. A "LOMR-F" refers to a LOMR based on new fill in the floodplain.

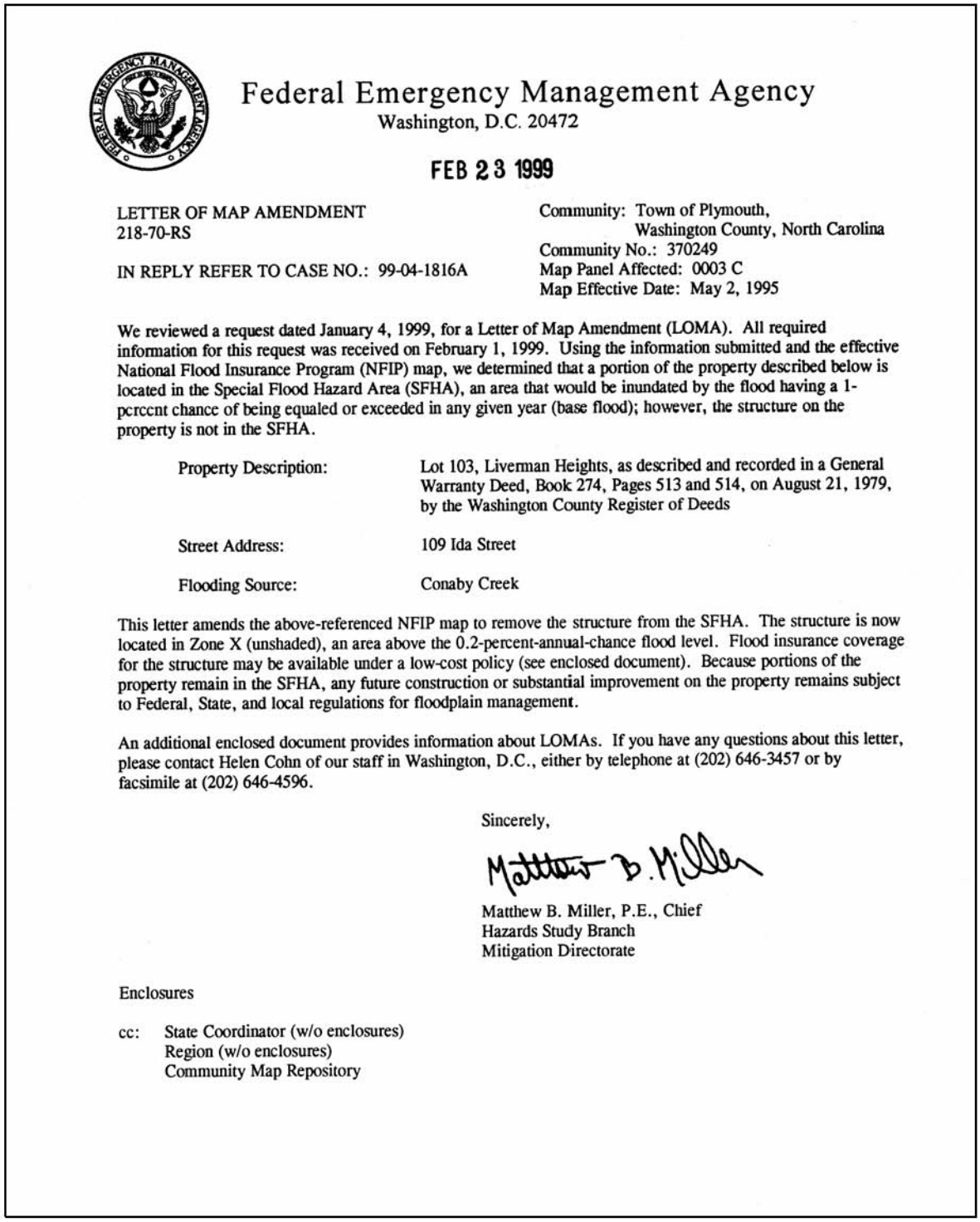
Because such a letter officially amends or revises the effective NFIP map, it is a public record that the community must maintain. Any LOMC should be noted on the community's master flood maps and filed by panel number in an accessible location.

If provided with a legal description of the land area above the BFE, FEMA can issue a LOMC for only a portion of the parcel. Or, a LOMC might state that only a specifically described portion (i.e. the front 70 feet with the exception of any recorded easements), is removed from the SFHA. However, the LOMC might then also state that portions of the rest of the property remain within the SFHA, subject to all floodplain management regulations.

NFIP maps are not changed based on *proposed* projects. However, an applicant may request a ***Conditional Letter of Map Revision (CLOMR)*** or a ***Conditional Letter of Map Revision based on Fill (CLOMR-F)*** based on proposed plans. A ***Conditional Letter of Map Amendment (CLOMA)*** can be requested for a vacant lot. These conditional letters inform the builder and others (such as the bank financing the project) that when the project is completed, it will qualify for a LOMR, LOMR-F, or LOMA. A LOMR, LOMR-F, or LOMA will still be required to officially change the NFIP map.

A processing fee is charged for LOMRs, CLOMRs , LOMR-Fs, and CLOMR-Fs and CLOMAs. There is no fee for requesting a LOMA.

An example of a LOMA is in Figure 4-6. For this site, the owner supplied the survey data needed to show that the lowest grade adjacent to his house was higher than the base flood elevation shown on the FIRM. Because the request affects only one property, a letter can be issued that describes the property and the type of map change (“This letter amends the above-referenced NFIP map to remove the structure from the SFHA.”).



Federal Emergency Management Agency
Washington, D.C. 20472

FEB 23 1999

LETTER OF MAP AMENDMENT
218-70-RS

IN REPLY REFER TO CASE NO.: 99-04-1816A

Community: Town of Plymouth,
Washington County, North Carolina
Community No.: 370249
Map Panel Affected: 0003 C
Map Effective Date: May 2, 1995

We reviewed a request dated January 4, 1999, for a Letter of Map Amendment (LOMA). All required information for this request was received on February 1, 1999. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we determined that a portion of the property described below is located in the Special Flood Hazard Area (SFHA), an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood); however, the structure on the property is not in the SFHA.

Property Description:	Lot 103, Liverman Heights, as described and recorded in a General Warranty Deed, Book 274, Pages 513 and 514, on August 21, 1979, by the Washington County Register of Deeds
Street Address:	109 Ida Street
Flooding Source:	Conaby Creek

This letter amends the above-referenced NFIP map to remove the structure from the SFHA. The structure is now located in Zone X (unshaded), an area above the 0.2-percent-annual-chance flood level. Flood insurance coverage for the structure may be available under a low-cost policy (see enclosed document). Because portions of the property remain in the SFHA, any future construction or substantial improvement on the property remains subject to Federal, State, and local regulations for floodplain management.

An additional enclosed document provides information about LOMAs. If you have any questions about this letter, please contact Helen Cohn of our staff in Washington, D.C., either by telephone at (202) 646-3457 or by facsimile at (202) 646-4596.

Sincerely,

Matthew B. Miller

Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: State Coordinator (w/o enclosures)
Region (w/o enclosures)
Community Map Repository

Figure 4-6: First page from a Letter of Map Amendment

REQUESTING MAP CHANGES

If you want a restudy or a limited map maintenance project, call your FEMA Regional Office or State NFIP coordinator and ask about the procedures.

If you want a map changed to reflect a new study that has already been done or to reflect better ground elevation data, use one of the following FEMA forms.

MT-1: Letter of Map Amendment (LOMA)
Conditional Letter of Map Amendment (CLOMA)
Letter of Map Revision (Based on Fill) (LOMR-F)
Conditional Letter of Map Revision (Based on Fill) (CLOMR-F)

MT-2: Letter of Map Revision (LOMR)
Conditional Letter of Map Revision (CLOMR)
Physical Map Revision

MT-EZ: Letter of Map Amendment (LOMA) for a single lot
Letter of Map Revision (Based on Fill) (LOMR-F) for a single lot

The MT-EZ is the shortest and simplest of the three forms. A copy is included in Appendix F. This is the form that would be used to request a LOMA like the one in Figure 4-6. A land surveyor is needed to certify the elevation data. Appendix F also includes a handout that explains the map change policies to property owners.

The building elevation certification requires some information not normally required on a FEMA Elevation Certificate, specifically, the lowest elevation on the parcel. This requirement is in addition to the lowest grade adjacent to the structure (including attached decks) and the lowest floor elevation (including the garage, crawlspace, or basement).

If the garage, crawlspace, or basement floor is below the base flood elevation and the building was built on fill that was placed in an identified SFHA, FEMA cannot issue a LOMA or LOMR even though the post-fill lowest adjacent grade is above the base flood elevation.

Except for the MT-EZ, requests for map changes should be completed by a qualified engineer or surveyor. The most common reason that a map change request is not completed is that the applicant did not submit adequate technical data to validate the change.

Note that a bank still has the prerogative to require the purchase of a flood insurance policy on a building that has been removed from the SFHA. The bank can require flood insurance as a condition of the loan in order to protect its investment in the property. For example, lenders in Florida typically still require flood insurance coverage for structures determined to be in shaded Zone X or Zone B.

Filled, unimproved land can be removed from SFHA on only the basis of the filled elevation, if no construction of a structure has begun when the request is submitted to FEMA.

Effective June 4, 2001, FEMA revised to process for issuing Letters of Map Revision (Based on Fill) (LOMR-F) to require assurances from the community that, for the area to be remove from the floodplain, all requirements of 44 CFR 60.3 have been met and that any existing or proposed structures in that area will be "reasonably safe from flooding." If the community cannot make these assurances, the LOMR-F will not be processed. Further guidance on the community's responsibility for making these assurances can be found in Unit 5 and in the MT-2 instructions and Technical Bulletin 10-01 *Ensuring That Structures Built on Fill in or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding.*

Additional information on map changes can be found in *Answers to Questions about the National Flood Insurance Program*, questions 81 – 95.