



OMB No. 1660-0022  
Expires: June 30, 2010

National Flood Insurance Program  
Community Rating System

# Coordinator's Manual

*FIA-15/2006*



**FEMA**

## 100 INTRODUCTION

The Introduction is an overview of the Community Rating System (CRS). Section 110 discusses the concepts of the CRS. Section 120 describes the floodplain management activities that are credited by the CRS and their relationship to community floodplain management programs. A glossary of terms appears as Section 130.

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## 110 PURPOSE AND SCOPE

### 111 Background

The National Flood Insurance Program (NFIP) provides federally backed flood insurance that encourages communities to enact and enforce floodplain regulations. Since its inception in 1968, the program has been very successful in helping flood victims get back on their feet. There are nearly 4.6 million policies in force, with about \$2 billion in written premiums. From 1978 through 2004, over 940,000 losses totaling almost \$14 billion have been paid.

To be covered by a flood insurance policy, a property must be in a community that participates in the NFIP. To qualify for the program, a community adopts and enforces a floodplain management ordinance to regulate development in flood hazard areas. The basic objective of the ordinance is to ensure that such development will not aggravate existing flooding conditions and that new buildings will be protected from flood damage. Today, over 19,000 communities participate in the NFIP.

The NFIP has been successful in requiring new buildings to be protected from damage by a 100-year flood. However, flood damage still results from floods greater than the 100-year flood and from flooding in unmapped areas. Under the Community Rating System (CRS), there is an incentive for communities to do more than just regulate construction of new buildings to minimum national standards. Under the CRS, flood insurance premiums are adjusted to reflect community activities that reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, protect new buildings beyond the minimum NFIP protection level, help insurance agents obtain flood data, and help people obtain flood insurance.

### 112 Goals

The goals of the National Flood Insurance Program (NFIP) are to provide flood insurance to property owners, to encourage flood loss reduction activities by communities, and to save taxpayers' money. The CRS is a part of the NFIP and provides both incentives and tools to further these goals.

The goals of the CRS are to recognize, encourage, and reward, by the use of flood insurance premium adjustments, community and state activities beyond the minimum required by the NFIP that

- Reduce flood damage to insurable property,
- Strengthen and support the insurance aspects of the NFIP, and
- Encourage a comprehensive approach to floodplain management.

The objective of the CRS is to support the goals of the NFIP. To do this, the CRS provides insurance premium rate reductions to policy holders in recognition that their communities implement activities that work toward its three goals of reducing flood damage, supporting the insurance part of the NFIP, and pursuing a broad approach to floodplain management.

In this process, the “community” part of the Community Rating System includes state and regional agencies and private organizations that support and assist city, county, and tribal governments that are participants in the NFIP. A closer look at how communities can implement these three goals follows.

- 1. Reduce flood damage to insurable property.** Communities are encouraged to map and provide regulatory flood data for all their flood hazards. The data should be used in their regulatory programs and shared with all users and inquirers. New buildings in mapped floodplains should be protected from the known local flood hazards, which may require setting standards higher than the minimum national criteria of the NFIP. Communities are encouraged to reduce the exposure of existing buildings to flood damage, especially repetitive loss properties.
- 2. Strengthen and support the insurance aspects of the NFIP.** Communities should encourage their residents to be aware of their flood risk and to purchase and maintain a flood insurance policy to protect themselves from the financial impacts of flooding. Communities should also help make the program more financially sound by implementing mapping and information programs that help to evaluate accurately the individual property risk for flood insurance rating purposes, expand the policy base, and reduce repetitive losses.
- 3. Encourage a comprehensive approach to floodplain management.** Insurable property is not the only floodplain management concern of communities, so the CRS recognizes efforts that protect lives; further public health, safety, and welfare; and protect natural floodplain functions. The community staff should understand the physical and biological processes that form and change floodplains and watersheds and take steps to deal with flooding, erosion, habitat loss, water quality, and special flood-related hazards. Floodplain management programs need to protect buildings, infrastructure, critical facilities, and natural functions and ensure that new development does not cause adverse impacts on others. A comprehensive approach uses all tools, including public information, planning, regulatory authorities, financial support, public works activities, and emergency management.

## 113 Operation

To be recognized in the insurance rating system, community floodplain management activities must be described, measured, and evaluated. The basic tool for this is the *CRS Schedule*, which sets forth the application procedures, creditable activities, and the credit points assigned to each activity. A community receives a CRS classification based upon the total score for its activities. The *CRS Commentary* explains the *Schedule* and gives examples of activities and how their credit is calculated. The *Schedule* and *Commentary* are included within the *CRS Coordinator's Manual*, the primary document detailing the program.

There are 10 CRS classes: Class 1 requires the most credit points and gives the greatest premium reduction; Class 10 receives no premium reduction. A community that does not apply for the CRS, or does not obtain the minimum number of credit points, is a Class 10 community.

Community participation in the CRS is voluntary. Any community in full compliance with the rules and regulations of the NFIP may apply for a CRS classification better than Class 10. The applicant community submits the CRS Application along with documentation which shows that it is implementing the activities for which credit is requested. All CRS credit is verified according to the detailed discussion of the activities in the Coordinator's Manual. The application process is discussed in more detail in the CRS Application.

The *Schedule* identifies 18 creditable activities, organized under four categories labeled Sections 300 through 600: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. The *Schedule* assigns credit points based upon the extent to which an activity advances the three goals of the CRS. Communities are invited to propose alternative approaches to these activities in their applications.

Some CRS activities may be implemented by the state or a regional agency rather than at the community level. For example, some states have disclosure laws that are creditable under Activity 340 (Flood Hazard Disclosure). Any community in those states will receive those credit points when it applies for CRS credit and demonstrates that the law is effectively implemented within its jurisdiction.

An application for a CRS classification may be submitted at any time. A community applies by sending a completed CRS Application with appropriate documentation to its ISO/CRS Specialist. Copies of all or parts of the application may be sent to the Regional Office of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) and to the State NFIP Coordinator.

The Insurance Services Office, Inc. (ISO) is subscribed to by more than 1,300 insurance companies. Among other services, ISO develops and provides advisory fire insurance classifications for community fire protection programs. ISO reviews CRS applications, verifies the communities' credit points, and performs program improvement tasks.

The community's activities and performance are reviewed during a verification visit. FEMA sets the credit to be granted and notifies the community, the state, insurance companies, and

other appropriate parties. The classification is effective on either May 1 or October 1, whichever comes first after the community's program is verified.

Each year the community must recertify or reverify that it is continuing to perform the activities that are being credited by the CRS. Recertification is an annual activity that includes progress reports for certain activities. The cycle verification takes place every few years and is conducted in the form of another verification visit to the community.

If a community is not properly or fully implementing the credited activities, its credit points, and possibly its CRS classification, will be revised. A community may add credited activities each year in order to improve its CRS classification.

Credit criteria will change over time as experience is gained in implementing, observing, and measuring the activities and as new concepts in floodplain management come into common practice. As innovations arise, they will be considered for recognition under the CRS.

Communities are encouraged to call on their ISO/CRS Specialist for assistance at any time. A week-long CRS course for local officials is offered free at FEMA's Emergency Management Institute. The ISO/CRS Specialist, State NFIP Coordinator, and FEMA Regional Office have more information on this course, state workshops, and other CRS training opportunities.

## **114 Community Responsibilities**

Once it has submitted its *CRS Application*, a community must continue to implement its credited activities to keep its classification. Specifically, a community is responsible for:

- Designating someone who is familiar with the agencies that implement CRS activities as the community's CRS Coordinator,
- Cooperating with the ISO/CRS Specialist and the verification procedures (Section 230),
- Recertifying each year that it is continuing to implement its activities (Section 214),
- Submitting the appropriate documents with its recertification (Section 214),
- Advising FEMA and its ISO/CRS Specialist of modifications in its activities (Section 215),
- Maintaining elevation certificates, other permit records, and old Flood Insurance Rate Maps (FIRMs) forever,
- Maintaining other records of its activities for five years, or until the next verification visit, whichever comes sooner, and
- Participating in the cycle verification process (Section 234).

Communities will receive periodic updates to the *Coordinator's Manual* and other CRS materials. They are encouraged to order the background publications (see Appendix E), attend CRS workshops, and ask their ISO/CRS Specialists for help understanding the CRS credit criteria for their current and planned activities.

## **115 Costs and Benefits**

Communities should prepare and implement those activities which best deal with their local problems, whether or not they are creditable under the CRS. Few, if any, of the CRS activities will produce premium reductions equal to or in excess of their implementation costs. In considering whether to undertake a new floodplain management activity, a community must consider all of the benefits the activity will provide (not just insurance premium reductions) in order to determine whether it is worth implementing.

### **a. Costs**

No fee is charged for a community to apply for participation in the CRS. The only costs the community incurs are those of implementing creditable floodplain management activities and the staff time needed to prepare the *CRS Application*.

### **b. Benefits**

It is important to note that reduced flood insurance rates are only one of the rewards a community receives from participating in the CRS. There are several other benefits.

First, the CRS floodplain management activities provide enhanced public safety, a reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering, and protection of the environment.

Second, through the CRS a community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.

Third, technical assistance in designing and implementing some activities is available through the CRS at no charge.

Fourth, a CRS community's flood program benefits from having an added incentive to maintain its flood programs over the years. The fact that the community's CRS status could be affected by the elimination of a flood-related activity or a weakening of the regulatory requirements for new development, should be taken into account by the governing board when considering such actions. A similar system used in fire insurance rating has had a strong impact on the level of support local governments give to their fire protection programs.

Fifth, implementing some CRS activities, such as floodplain management planning, can help a community qualify for certain federal assistance programs.



## 116 Natural and Beneficial Functions

Floodplains perform certain natural and beneficial functions that cannot be duplicated elsewhere. The CRS provides special credit for community activities that protect these functions, even though some of the activities may not directly reduce flood losses to insurable buildings. Two types of “natural and beneficial functions” warrant protecting floodplains in their natural state.

1. Floodplains in their natural state have an important impact on flooding. Flood waters can spread over a large area in floodplains that have not been encroached upon. This reduces flood velocities and provides flood storage to reduce peak flows downstream. Natural floodplains reduce wind and wave impacts and their vegetation stabilizes soils during flooding.
2. Floodplains in their natural state provide “ancillary beneficial functions” beyond flood reduction. Water quality is improved in areas where natural cover acts as a filter for runoff and overbank flows; sediment loads and impurities are also minimized. Natural floodplains moderate water temperature, reducing the possibility of adverse impacts on aquatic plants and animals.

Floodplains can act as recharge areas for groundwater and reduce the frequency and duration of low flows of surface water. They provide habitat for diverse species of flora and fauna, some of which cannot live anywhere else. They are particularly important as breeding and feeding areas.

The CRS encourages state, local, and private programs and projects that preserve or restore the natural state of floodplains and protect these functions. The CRS also encourages communities to coordinate their flood loss reduction programs with Habitat Conservation Plans and other public and private activities that preserve and protect natural and beneficial floodplain functions. Credits for doing this are found in the following activities:

330 Outreach Projects: Credit is provided for outreach projects that include descriptions of the natural and beneficial floodplain functions of the community’s floodplains.

420 Open Space Preservation: Extra credit is provided for open space areas that are preserved in their natural state, have been restored to a condition approximating their pre-development natural state, or have been designated as worthy of preservation for their natural benefits, such as being designated in a Habitat Conservation Plan.

430 Higher Regulatory Standards: Regulations that protect natural areas during development or that protect water quality are credited.

450 Stormwater Management: Erosion and sediment control and water quality requirements for projects that affect stormwater runoff are credited.

510 Floodplain Management Planning: Extra credit is provided for plans that address floodplain natural resources and that are coordinated with a community's Habitat Conservation Plan.

## **117 CRS Activities**

The *CRS Schedule* describes the 18 floodplain management activities credited by the CRS and the documentation required to receive credit for each activity. The credits and formulae used to calculate credit are also included. These activities are divided into four categories.

### **Public Information (Series 300)**

This series credits programs that advise people about the flood hazard, flood insurance, and ways to reduce flood damage. These activities also provide data needed by insurance agents for accurate flood insurance rating. They generally serve all members of the community and work toward all three goals of the CRS.

### **Mapping and Regulations (Series 400)**

This series credits programs that provide increased protection to new development. These activities include mapping areas not shown on the FIRM, preserving open space, enforcing higher regulatory standards, and managing stormwater. The credit is increased for growing communities. These activities work toward the first and second goals of the CRS, damage reduction and accurate insurance rating.

### **Flood Damage Reduction (Series 500)**

This series credits programs for areas in which existing development is at risk. Credit is provided for a comprehensive floodplain management plan, relocating or retrofitting floodprone structures, and maintaining drainage systems. These activities work toward the first goal of the CRS, damage reduction.

### **Flood Preparedness (Series 600)**

This series credits flood warning, levee safety, and dam safety programs. These activities work toward the first and third goals of the CRS, damage reduction and hazard awareness.

***NOTE:** The CRS encourages communities to develop and implement locally pertinent programs that exceed the minimum criteria of the NFIP. It is the intent of the CRS to credit only those activities that are compliant with applicable federal, state, and local environmental laws and regulations, including the Endangered Species Act of 1973. Where this is an issue, it is the responsibility of the community to demonstrate that an activity complies with those laws or regulations.*

The CRS activities are not design standards for local floodplain management. The *Schedule* is an insurance tool that describes methods of calculating credit points for various community activities. The fact that the CRS does not provide a direct credit for some activities does not mean that they should not be implemented by communities that need them.

Some activities and elements are not directly recognized by the CRS for one of three reasons:

1. They do not directly impact buildings that can be insured under the NFIP (e.g., uninsurable items such as streets and land values);
2. They are recognized by other aspects of the flood insurance rating program (e.g., flood control projects that result in revised FIRMs reduce flood insurance premiums in protected areas); or
3. The impact of an activity cannot be measured for CRS credit (e.g., preserving floodplains for aesthetic reasons).

## **118 Uniform Minimum Credit**

Many communities can qualify for “uniform minimum credit” whereby a state or regional agency can apply for a CRS activity that it is implementing on behalf of its communities. For example, several Florida water management districts enforce their own stormwater management regulations. A community in one of those districts that applies to the CRS will qualify for its district’s stormwater management credit.

If the community has its own program that deserves more credit points, it may apply for more than the uniform minimum credit points. This approach saves time and money for everyone involved. Agencies or communities interested in uniform minimum credits should contact their FEMA Regional Office or ISO/CRS Specialist for more information (see Appendix A).

## **119 All-Hazard Mitigation**

Communities with flood problems are also likely to be threatened by other natural and technological hazards. The staff and programs that address flooding may also be responsible for protecting the community from earthquakes, hurricanes, landslides, drought, hazardous materials incidents, and terrorism. Similarly, staff that work in programs related to other hazards may be implementing activities that could support floodplain management programs.

FEMA supports an all-hazards approach to mitigation, as does the CRS. It makes economic sense that mitigation programs address as many hazards as are appropriate. An all-hazards approach also ensures that staff, programs, construction standards, and public information messages are consistent and mutually supportive.

The CRS has become an important tool for mitigation as well as a mechanism for integrating mitigation with flood insurance. This is consistent not only with grading systems that have

been successfully employed for many years in the insurance industry, but also with new industry initiatives for relating insurance premiums to local community efforts to reduce losses due to natural hazards. For example, adoption and enforcement of strong building codes as measured by the insurance industry's Building Code Effectiveness Grading Schedule integrates building code enforcement into the industry's premium rates.

The CRS has served as a model for all-hazards pre-disaster mitigation activities. Several local officials have reported that the CRS was the blueprint for organizing their program to build a more disaster-resistant community.

The 2006 edition of the *CRS Coordinator's Manual* highlights many opportunities for expanding a flood-only orientation to address other hazards. These include:

- The 300 series of public information activities credits advising people about the risk of flooding and other hazards and the mitigation measures they can take to protect their properties;
- Under Activity 340 (Hazard Disclosure), disclosure of other hazards (DOH) credits advising potential purchasers of property that there may be other hazards that could affect the property, such as erosion, subsidence, or wetlands;
- The credit for placing references in the public library under Activity 350 (Flood Protection Assistance) includes extra points for including documents on special flood-related hazards such as subsidence and coastal erosion;
- Section 401 has an overview of the additional credits that are provided for mapping and managing seven special hazards:
  - Uncertain flow paths (alluvial fans, moveable bed streams, and other floodplains within which the channel moves during a flood),
  - Closed basin lakes,
  - Ice jams,
  - Land subsidence,
  - Mudflow hazards,
  - Coastal erosion, and
  - Tsunamis.
- Activity 420 (Open Space Preservation) encourages communities to keep hazardous areas open and undeveloped;
- Credit is provided for the International Series of building codes (which have improved protection standards for flooding, wind, and other hazards over previous model codes) in Activity 430 (Higher Regulatory Standards), Section 431.m;
- Activity 430 (Higher Regulatory Standards) also credits extending V-Zone standards for coastal storm surge and wind protection farther inland to include coastal A Zones (Section 431.p);

- Section 430LD (Land Development Criteria) increases the credit for land use and development regulations in areas of mapped special hazards;
- In Activity 440 (Flood Data Maintenance), additional credit is provided for showing areas subject to other natural hazards in the GIS or database management program;
- More credit points are available for including other hazards in a mitigation plan that qualifies for a floodplain management plan under Activity 510 (Floodplain Management Planning); and
- Local warning and public information activities directed toward storms and tsunamis are credited under the StormReady and TsunamiReady element in Activity 610 (Flood Warning Program).

## 130 GLOSSARY

Unless otherwise noted, all terms used by the Community Rating System (CRS) are the same as those defined in the National Flood Insurance Program Rules and Regulations (44 *CFR* 59.1).

**A Zone:** See “Zone A.”

**Activity:** A floodplain management activity for which Community Rating System credit has been established.

**Allowable surcharge:** The acceptable limit of increased flood elevation in the floodway due to obstruction of the floodway fringe.

**Alluvial fan:** An area at the base of a valley where the slope flattens out, allowing the floodwater to decrease in speed and spread out, dropping sediment over a fan-shaped area. The Community Rating System credits alluvial fan flooding under the “uncertain flow paths” hazard in a special CRS publication.

**B Zone:** See “Zone B.”

**Base flood:** The flood having a 1% chance of being equaled or exceeded in any given year, also known as the “100-year” or “1% chance” flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program are protected to the same degree against flooding.

**BFE:** Base flood elevation. The elevation of the crest of the base or 100-year flood.

**Building:** As used by the Community Rating System, the term is the same as “structure” in the National Flood Insurance Program regulations (44 *CFR* 59.1). For CRS purposes, a building is a structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured (mobile) home on a permanent foundation (such as a poured masonry slab, foundation walls, piers, or block supports) so that no weight is carried by the wheels and axles. “Walled and roofed” means that a building has two or more rigid exterior walls in place and is adequately anchored so that it will resist flotation, collapse, and lateral movement. “Principally above ground” means that at least 51% of the actual cash value of the building, including equipment and machinery that are part of the building, is above ground. The NFIP only insures “buildings.” For the purpose of counting buildings for adjusting CRS credit points, the term “building” does not include accessory structures. For example, a lot with a home, garage, and shed is counted as one building.

**C Zone:** See “Zone C.”

**CBRA:** The Coastal Barrier Resources Act of 1982 (pronounced “cobra”).

**CEO:** The Chief Executive Officer of a community, i.e., the official who is charged with the authority to implement and administer laws, ordinances, and regulations for the community. The CEO may be a mayor, city or county manager, or chair of a county board.

**Coastal:** Relating to the coastlines and bays of the tidal waters of the United States or the shorelines of the Great Lakes. Under the Community Rating System, there are four coastal areas eligible for creditable coastal activities: the coastlines and bays of the Atlantic, Pacific, Gulf of Mexico, and Great Lakes coasts. The term does not include riverine areas.

**Coastal A Zone:** Those parts of a community’s coastal floodplain, inland from the mapped V Zone (or shoreline if there is no mapped V Zone), that are subject to the damaging effects of waves, velocity flows, erosion, scour, or combinations of these forces. The exact boundary of a coastal A Zone is determined by the community, as described in Section 431.p, although the Federal Emergency Management Agency may provide a proposed boundary or “limit of moderate wave action” on Flood Insurance Rate Maps.

**Coastal Barrier Resources System:** A set of “undeveloped coastal barriers” and “otherwise protected areas” along the U.S. coast (including the Great Lakes) designated by Congress under the Coastal Barrier Resources Act of 1982 (CBRA). Most expenditures of federal funds are prohibited within the Coastal Barrier Resources System.

**Coastal erosion:** Coastal erosion is the wearing away of land masses caused primarily by waves on the two oceans, the Gulf of Mexico, or the Great Lakes, and major embayments to these bodies of water.

**Coastal erosion-prone area:** The coastal areas within which waves are anticipated to cause significant erosion and shoreline retreat within the next 60 years.

**Coastal high hazard flooding:** A condition of flooding subject to high velocity waters, including, but not limited to, hurricane wave wash or tsunamis. Coastal high hazard flooding is mapped as a Zone V on a Flood Insurance Rate Map. Coastal flooding without the high velocity hazard is mapped as a Zone A.

**Community:** A city, village, town, county, township, Indian tribe or authorized tribal organization, Alaska Native village or authorized native organization, or other local government with the statutory authority to enact floodplain regulations and participate in the National Flood Insurance Program.

**Contour:** A line of equal elevation on a topographic (contour) map.

**Critical facilities:**

- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic and/or water-reactive materials;
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a flood;
- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for flood response activities before, during, and after a flood; and
- Public and private utility facilities that are vital to maintaining or restoring normal services to flooded areas before, during, and after a flood.

**CRS:** Community Rating System.

**CRS Application:** The publication that is generally used by a community to apply for its initial Community Rating System classification. This publication includes a description of the CRS activities, application procedures, and the documentation the community needs to provide with its application.

**CRS classification:** A rating of a community's floodplain management program according to the *CRS Schedule*. The premium rate credits for each class are listed in Appendix C. A community that has not applied for Community Rating System classification is a Class 10 community.

**CRS Commentary:** The portion of the *CRS Coordinator's Manual* that explains the Community Rating System in more detail than the *CRS Schedule*. It includes instructions on how to apply for a CRS classification, along with references on and examples of the creditable activities.

**CRS Coordinator:** A local official designated by the community's Chief Executive Officer to coordinate the community's Community Rating System application and verification.

**CRS Coordinator's Manual:** A publication for local officials that includes the Community Rating System *CRS Schedule*, *CRS Commentary*, and activity worksheets. It is available from FEMA or ISO.

**CRS Schedule:** The portion of the *CRS Coordinator's Manual* that describes the Community Rating System and how credit points are calculated to determine a community's CRS classification.

**Cycle:** A periodic review, scoring, and verification of a community's Community Rating System activities, normally done on a 3- or 5-year cycle.

**D Zone:** See "Zone D."

**Datum:** A reference surface used to ensure that all elevation records are properly related. Many communities have their own datum, developed before there was a national standard. The National Flood Insurance Program uses the National Geodetic Vertical Datum (NGVD) of 1929 and the North American Vertical Datum (NAVD) of 1988, which are in relation to sea level. The Flood Insurance Rate Map indicates the datum that applies to the community.

**Development:** Any human-caused change to improved or unimproved real estate including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations.

**Discharge:** The amount of water that passes a point in a given period of time. Rate of discharge is usually measured in cubic feet per second (cfs).

**Element:** A discrete piece of a floodplain management program that is credited as part of a Community Rating System activity.



**FEMA:** The Department of Homeland Security’s Federal Emergency Management Agency. Most of the National Flood Insurance Program field work and community coordination is done by the 10 FEMA Regional Offices, which are listed in Appendix A.

**FIRM:** Flood Insurance Rate Map. An official map of a community, on which FEMA has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to the community. Most FIRMs include detailed floodplain mapping for some or all of a community’s floodplains. In most cases, the date of the first FIRM issued to a community is the date the community entered the Regular Program of the National Flood Insurance Program.

**Flood Insurance Study:** A report published by FEMA for a community in conjunction with the community’s Flood Insurance Rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

**Floodplain:** Any land area susceptible to being inundated by flood waters from any source. A Flood Insurance Rate Map identifies most, but not necessarily all, of a community’s floodplain as the Special Flood Hazard Area.

**Floodproofing:** Protective measures added to or incorporated in a building that is not elevated above the base flood elevation to prevent or minimize flood damage. “Dry floodproofing” measures are designed to keep water from entering a building. “Wet floodproofing” measures minimize damage to a structure and its contents from water that is allowed into a building.

**Floodway:** The channel of a river and the portion of the overbank floodplain that carries most of the base flood. The floodway must be kept open so that floods can proceed downstream and not be obstructed or diverted onto other properties. The National Flood Insurance Program regulations allow construction in the floodway provided that it does not obstruct flood flows or increase flood heights.

**Flood fringe:** The portion of the floodplain lying on either side of the floodway.

**Freeboard:** A margin of safety added to the base flood elevation to account for waves, debris, miscalculations, or lack of data.

**Hydrology:** The science dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.

**ICC:** Increased Cost of Compliance, a flood insurance claim provision that helps fund the cost of bringing a flood-damaged building into compliance with floodplain management standards.

**ISO:** The Insurance Services Office, Inc., a corporation that conducts Community Rating System application review, verification of community credit, and program improvement tasks for FEMA.

## 300 PUBLIC INFORMATION ACTIVITIES

The Community Rating System (CRS) will credit those local activities that advise people about the flood hazard, flood insurance, and flood protection measures. The activities can be directed toward floodplain residents, property owners, insurance agents, real estate agents, or other segments of the local populace. One activity, 310 (Elevation Certificates), is mandatory for CRS classification.

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## 310 ELEVATION CERTIFICATES

### Summary of Activity 310

**311 Credit Points.** There are five elements in this activity for a maximum of 162 points.

- a. Maintaining elevation certificates (EC): Up to 56 points are provided for maintaining FEMA elevation certificates on all buildings built in the Special Flood Hazard Area (SFHA) after the date of application to the CRS. All communities applying to the CRS must apply for this element. The community must make copies of the certificates available to all inquirers. The FEMA elevation certificate is shown in Figure 310-2.
- b. Maintaining elevation certificates for post-FIRM buildings (ECPO): Up to 56 points are provided for maintaining elevation certificates on buildings built before the date of application to the CRS but after the initial date of the Flood Insurance Rate Map (FIRM).
- c. Maintaining elevation certificates for pre-FIRM buildings (ECPR): Up to 15 points are provided for maintaining elevation certificates on buildings built before the initial date of the FIRM.
- d. Maintaining elevation certificates in computer format (ECCF): Up to 15 points are provided if the elevation certificate data are kept and made available in computer format. A free elevation certificate computer program may be ordered (see Appendix E).
- e. Maintaining elevation certificate data on a website (ECWS): Up to 20 points are provided for putting elevation certificate data on a publicly accessible website.
- f. Having off-site record storage (ORS): Up to 10 points are provided for keeping all elevation certifications, regulations, plans, and other records in a secure area away from the permit office.

**312 Impact Adjustment.** The credit points for the last four elements are adjusted in one of three ways. There is no impact adjustment for EC.

- a. Under Option 1, where there are elevation certificates on all buildings that could have them, the impact adjustment ratio is 1.0.
- b. Under Option 2, where there are elevation certificates on at least 25% of all buildings that could have them, the impact adjustment ratio is 0.25.
- c. Under Option 3, the impact adjustment ratios reflect the proportion of buildings that have elevation certificates.

**313 Credit Calculation.** The credit points for each element are multiplied by the impact adjustment ratios.

**314 Credit Documentation.** The community must have the following available to verify implementation of this activity:

- a. [If applying for ECPO or ECPR and the community used a form different from FEMA's] A copy of the elevation certificate form and documentation that FEMA has approved the community's form.
- b. [If applying for ECCF credit] A copy of the computer format (if it is different from the software listed in Appendix E).
- c. Copies of all completed elevation certificates that the community wants credited for EC, ECPR, or ECPO. Sample copies of the digital or website versions will be collected to document credit for ECCF and ECWS.
- d. [If applying for ECWS credit] The website address.
- e. Documentation showing how the impact adjustments were determined and how the community maintains, stores, and provides copies of elevation certificates.

The community must submit the following with its annual CRS recertification.

- f. [If applying for ECCF credit] A disk with the previous year's elevation certificate data.

### 315 For More Information

## 310 ELEVATION CERTIFICATES

**Background:** According to insurance agents, one of the greatest impediments to selling flood insurance is the difficulty of obtaining accurate flood insurance rating zone and building elevation data. All of the technical data an agent needs should be recorded on the Department of Homeland Security's Federal Emergency Management Agency (FEMA) elevation certificate. The National Flood Insurance Program (NFIP) requires communities to maintain records of the elevations of new buildings and substantial improvements, but not necessarily on FEMA's forms.

The NFIP requirement for maintaining a record of the elevation of the lowest floor of any new building or substantial improvement built in the Special Flood Hazard Area (SFHA) is described in the *Code of Federal Regulations* (44 *CFR* 60.3(b)(5)(iii)). It states that the community must "maintain a record," but it does not specify a format for the record. Many communities already use FEMA elevation certificates. The latest version of FEMA's form and instructions for it are shown in Figures 310-2a through n.

In 44 *CFR* 59.22(a)(9)(iii), the NFIP also requires that communities make their elevation and related building information available for public inspection and flood insurance rating. Because the NFIP does require insurance agents to use the FEMA form, their jobs are much easier when that form is readily available from the local building department. The information supplied with flood insurance applications is usually more accurate when the form is prepared at the time of construction by someone familiar with the NFIP.

Use of the FEMA form also serves as a reminder to the local building officials of their obligations to the NFIP and of the availability of flood insurance. Therefore, this activity works toward all three Community Rating System (CRS) goals: reducing flood losses, facilitating accurate flood insurance rating, and promoting the awareness of flood insurance.

Almost all buildings built to meet NFIP criteria are raised so the lowest floor is at or above the base flood elevation, but some non-residential buildings are floodproofed. The NFIP rules (44 *CFR* 60.3(c)(4)(ii)) require the community to keep floodproofing records. An example of the latest version of FEMA's floodproofing certificate (FEMA Form 81-65) is shown in Figure 310-3.

Communities that have received a residential basement floodproofing exception must use FEMA's residential basement floodproofing certificate (FEMA Form 81-78) where applicable. An example of this form and the communities approved to use it are included in Figures 310-4 and 310-5, respectively.

**Activity Description:** Credit is provided if the community maintains FEMA elevation certificates for new and substantially improved construction. To participate in the CRS, a community must maintain completed FEMA elevation certificates on all buildings con-

structed, substantially improved, or placed in the SFHA after its initial date of application for the CRS. The community must agree to use the certificate and make copies available to any inquirer. All discussions about elevation certificates also apply to FEMA's floodproofing certificate and the residential basement floodproofing certificate.

Copies of the FEMA elevation and floodproofing certificates are available free in quantity from FEMA (see Section 315) and can be downloaded from FEMA's website at <http://www.fema.gov/nfip/elvinst.shtm>. Instructions are included with the forms.

Only the current FEMA form is acceptable. Local versions are no longer recognized for elevation certificates that were completed after October 1, 2000. A community may receive credit by transferring data from other forms onto a FEMA elevation certificate.

To receive a CRS classification, the community must start using the forms when it applies; so forms need to be kept only for buildings built or substantially improved after that date. Credit is also provided if the community had been using the forms since it joined the Regular Program or if it transferred post-FIRM building elevation data to the forms. Additional credit is awarded if the community provides certificates for pre-FIRM buildings or maintains the data in a computer format.

THE MINIMUM REQUIREMENT FOR THIS ACTIVITY IS THAT THE COMMUNITY MAINTAIN CERTIFICATES ON ALL NEW SFHA BUILDINGS AND SUBSTANTIAL IMPROVEMENTS PERMITTED AFTER THE COMMUNITY APPLIES FOR CRS CREDIT. Because the community's Chief Executive Officer (CEO) certifies in the application that it is doing this, the community will receive up to 56 points for EC (Elevation Certificates) under Section 311.a.

Those few NFIP communities which have no SFHA may not receive credit for this activity. Instead, the CEO must certify that the community has no SFHA and is therefore not applying for credit for this activity.

If a community with no SFHA is participating in the CRS and later receives a FIRM from FEMA that includes areas of SFHA, it must begin maintaining elevation certificates on the date of the FIRM or it will lose its CRS classification.

A community that has no SFHA at the time of its CRS application but later receives a FIRM and begins maintaining elevation certificates will receive credit for EC. It also may receive credit for maintaining post-FIRM elevation certificates (ECPO).

This activity is a minimum requirement for participation in the CRS. A verified EC score of 45 points or more is necessary to meet this requirement. If the verified score is less than 45, the CEO will be advised that the community will remain a Class 10.

During the community verification visit, the ISO/CRS Specialist will review a sample of elevation certificates as explained in Section 232. If the ISO/CRS Specialist finds that the community has not been maintaining the forms or has not been making copies available, the value for the element EC (Section 311.a) will be zero. If the ISO/CRS Specialist finds that some forms are not completed correctly, the points will be reduced. A verified score of less than 45 for EC will result in no credit for this activity. If the community does not receive any credit for this activity, it will remain a Class 10.

### 311 Credit Points

Maximum credit for Activity 310: 162 points.

Prerequisites: Credit for all elements in this activity is dependent on the following:

1. The community must maintain completed elevation certificates showing the “finished construction” elevations for all buildings constructed or substantially improved in the SFHA during the period credited;
2. The community must review the elevation certificates to ensure that the information is correct; and
3. The community must make copies of elevation certificates readily available to the property owners, their agents, and FEMA.

These three criteria must be met to receive full credit for each of the four elements. It is also recommended that a community publicize the availability of elevation certificates.

The community should develop procedures to ensure that the data are correct for each site. During the verification visit, the ISO/CRS Specialist will check for the following items on a sample of elevation certificates.

#### SECTION A—PROPERTY INFORMATION

- A 2. and A3. Complete street address or property description. In either case, the city, state, and zip code must be listed
- A7. Building diagram number
- A8. a), b), and c) Enclosure and crawl space information for buildings that are diagrams 6, 7, or 8.
- A9. a), b), and c) Attached garage information. If no attached garage, enter “N/A” in all three spaces.

#### SECTION B—FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

- B1. NFIP community name & community number
- B4. Map and panel number
- B5. Suffix
- B7. FIRM panel effective/revised date
- B8. Flood zone(s) in which the building is located
- B9. Base flood elevation(s)
- B10. The source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
- B11. The elevation datum used for the BFE in B9
- B12. Whether the building is located in a Coastal Barrier Resources System area or Otherwise Protected Area

**SECTION C—BUILDING ELEVATION INFORMATION (when a survey is required)**

- C1. Building elevations based on: Note: “Finished construction” must be checked unless the building is still under construction.
- C2. All items are required to have an entry. If the datum is different from the datum used for the BFE in Section B, the datum conversion must be recorded in this section or in Section D or G, as appropriate.

Elevation items a), f), and g) must be recorded on every certificate. If an item does not apply, enter “N/A” in the fields where no data are being supplied. If there are no flood vents, items h) and i) should have “0” entered.

Items b) and c) must be completed with an elevation if they are applicable and if that letter appears on the diagram on pages 6 and 7 of the instructions.

Where there is an attached garage, an elevation must be entered for item d), otherwise the entry is “N/A.” Where there is machinery and/or equipment that service the building, an elevation must be entered for item e), otherwise the entry is “N/A.”

**SECTION D—SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION**

CERTIFIER’S NAME and LICENSE NUMBER

CERTIFIER’S SIGNATURE

DATE

The box at the end of Section D must have the certifier’s seal. *[If there is a signature and/or date in the box, there does not have to be a separate signature or date on the line.]*

**SECTION E—BUILDING ELEVATION INFORMATION (when a survey is not required in a Zone AO or a Zone A without a base flood elevation)**

- E1. a) and b) Enter the difference between the top of the bottom floor and the highest and lowest adjacent grade.
- E2. For Building Diagrams 6–8 with openings (see page 8), enter the difference between the top of the next higher floor and the highest adjacent grade.
- E3. Enter the difference between the top of the garage slab and the highest adjacent grade.
- E4. Enter the difference between the top of the platform for machinery or equipment and the highest adjacent grade.
- E5. Zone AO (only) Elevation of bottom floor complies with the ordinance (if there is no base flood depth provided).

Note: If Section E is used, then Sections F or G must be completed.

**SECTION F—PROPERTY OWNER (OR OWNER’S REPRESENTATIVE) CERTIFICATION**

This section is used if Section E is completed by the owner or owner’s representative. If used, this section must include the property owner’s or representative’s name in the first line and the signature in the third line.

**SECTION G—COMMUNITY INFORMATION**

If G1 is checked, then the first and third lines after G9 (the local official’s name and signature) must be completed. NOTE: If a local official, authorized by law to complete an elevation certificate, fills out ALL the information (including elevation data), then G8, G9, and the signature block must be completed.

If any of these items is not completed or correct, the ISO/CRS Specialist will adjust the element’s credit points. IF MORE THAN 20% OF THE SAMPLED ELEVATION CERTIFICATES HAVE ONE OR MORE OF THESE DEFICIENCIES, THE COMMUNITY WILL LOSE ITS CREDIT FOR THAT ELEMENT. LOSS OF CREDIT FOR THE FIRST ELEMENT, EC, MEANS THAT THE COMMUNITY MUST REMAIN A CLASS 10. NOTE THAT, ALTHOUGH ITEM A6. OF THE ELEVATION CERTIFICATE INSTRUCTIONS REQUIRES PHOTOS OF THE STRUCTURE, THAT IS A REQUIREMENT ONLY FOR PURCHASING FLOOD INSURANCE. PHOTOS ARE NOT REQUIRED FOR THE COMMUNITY’S PERMIT RECORDS NOR FOR CRS CREDIT.



It is the community's responsibility to ensure that the elevation certificates it maintains have been completed correctly. Certificates provided by surveyors must be proofread and corrected if there are errors or omissions.

Although the surveyed elevations are likely to be correct, it is not unusual for surveyors to enter the wrong FIRM date or diagram number or fail to complete all the entries in Section C3. If there are certificates that have some of the above items omitted or incorrectly filled out, the community has the following options:

1. For any inaccurate or incomplete information in Section C2, the local official should request a new certificate. If Sections C2a)—c) are completed correctly, but some information in Sections C2d)—g) is missing, the local official may visit the site and collect the missing data by measuring from the surveyed floors.
2. The local official can do the following if incomplete or inaccurate information is found in the other sections. The local official should not mark up the form with the correct information.
  - a) The forms may be returned to the surveyor with instructions on what needs to be changed or corrected;
  - b) The local official can prepare a separate memo with the correct information and attach the memo to the form. When the certificate is provided to an inquirer, the memo must be included with it; or
  - c) The local official can note the changes or corrections in Section G.
3. The corrections to Sections A, B, C1 can be made when the data on the certificate is entered into a data base or elevation certificate software (see Section 311.d on maintaining elevation certificates in computer format). It must be noted in Section G what changes were made to the original paper copy. The local official should check G1 when data are entered into a data base or elevation certificate software. The community will still need to keep the original certificate, but can hand out copies printed from the corrected digital version.

It should be noted that the community assumes responsibility for the accuracy of the changes it makes. Therefore, data entry for digital versions should be double-checked.

Although surveyors may not be familiar with the intricacies of the form, they do know how to survey elevations. One way communities have improved the quality of elevation certificates is to complete Sections A and B at the time of permit application. The partially completed form is given to the applicant or the surveyor who can then focus on completing the surveyed information in Section C. This has been shown to reduce many of the more common errors.

In order to meet the requirements of the third prerequisite, the community must keep copies of all credited elevation certificates readily available. The community must be able to retrieve certificates for old permits, including those from projects whose permit files may have been archived or discarded. The certificates may be maintained in a computer format, but the community must be able to respond to inquirers who want to see the original hard copy. The community may pass the cost of preparing the elevation certificate on to the permit applicant and it may charge a reasonable fee to cover the cost of copying the certificates for inquirers.

a. Maintaining elevation certificates (EC) (Maximum credit: 56 points)

EC = 56 if the community maintains elevation certificates since the date of application to the CRS. The community receives the full 56 credit points for EC unless it is adjusted during the verification visit. If no permits have been issued for structures within the SFHA since the community's application date for the CRS, EC = 56.

The community will automatically receive 56 points for EC because the CEO certifies in the application that the forms will be maintained and made available. EC is only adjusted to less than 56 points if the findings of the verification visit warrant such a reduction. As discussed above, the credit points will be reduced if incorrect or incomplete information appears on the elevation certificates checked during the verification visit.

b. Maintaining elevation certificates for post-FIRM buildings (ECPO) (Maximum credit: 56 points)

ECPO = 56 points if completed certificates are maintained for all buildings built or substantially improved in the SFHA between the date of the community's initial FIRM and the date of application to the CRS. ECPO is adjusted according to the ratio of post-FIRM buildings for which the community has certificates (see Section 312).

This credit is provided for having elevation certificates for all buildings built or substantially improved in the SFHA since the date of the community's initial FIRM. If the community only has certificates for some of these buildings, then the value for ECPO is adjusted as described in Section 312, Impact Adjustment.

c. Maintaining elevation certificates for pre-FIRM buildings (ECPR) (Maximum credit: 15 points)

ECPR = 15 points if completed certificates are maintained for all buildings built or substantially improved in the SFHA before the date of the community's initial FIRM. ECPR is adjusted according to the ratio of pre-FIRM buildings for which the community has certificates (see Section 312).

Although most communities did not keep elevation records before they joined the Regular Program, lowest floor elevations may have been determined for a flood protection study. If the data are transferred to the FEMA forms, credit can be provided under ECPR. If the records cover only some of the pre-FIRM buildings, ECPR is adjusted in the same manner as ECPO, as described in Section 312, Impact Adjustment.

***NOTE:** Elevation certificates can be completed by a local official who is authorized by law or ordinance to administer the community's floodplain management program, provided the original surveyed data for Section C was obtained by a registered land surveyor, engineer, or architect. A community can transfer data from a surveying project to the elevation certificate form if it can demonstrate that the source of the data was appropriate.*

*For example, the National Flood Mitigation Data Collection Tool described in Section 511.b can be used to collect a wealth of data on a building. If the local official can document that a surveyor shot the elevations collected in the Tool, it would be relatively simple to transfer the data to the elevation certificate form, which would be signed in Section G by the local official.*

d. Maintaining elevation certificates in computer format (ECCF) (Maximum credit: 15 points).

ECCF = 10 points if the elevation and floodproofing certificate data are kept in computer format and provided to FEMA each year. An additional 5 points are provided if the data for every property lists a street address. ECCF is adjusted according to the ratio of all buildings that have elevation certificates that are also in computer format (see Section 312). There is no credit if the data base does not include all of the data needed for a FEMA elevation certificate.

This credit is available if the community has elevation records on a computer data base, and is willing to provide FEMA with a disk or other computer-readable record. A program has been developed to enter elevation certificate data on a personal computer. This program meets the requirements for ECCF credit, and it is available free (see Appendix E). The community must maintain and be able to retrieve the original signed hard copies.

Five additional points are provided if the community screens its data and makes sure that a full street address is provided with each certificate. These five points are not available if some properties are listed by lot and block number or other method.

e. Posting elevation certificate data on a website (ECWS) (Maximum credit: 20 points).

ECWS = 20, if the community has put elevation certificate data on a website that is readily available to any inquirer (e.g., no payment of money is needed). There is no credit if the data base does not include all of the data needed for a FEMA elevation certificate.

Credit is provided if the community puts the elevation certificate data on a website that can be accessed by the public. This can be in the form of a searchable data base, scanned elevation certificates, or any other format that makes the data available. This credit is in addition to the ECCF credit for providing FEMA with a disk that has elevation certificate data. In both cases, the data base must include all of the data needed for a FEMA elevation certificate.

f. Off-site record storage (ORS) (maximum credit: 10 points):

ORS = 10, if all elevation certificates, regulations, plans, and other key records for floodplain development permits are stored in a secure location, outside of any floodprone area and at least one mile away from the permit office. The records must be copied to the off-site storage location at least once each year.

In the past, hurricanes, fires, floods, and other disasters have destroyed local permit offices and their files. This credit encourages communities to safeguard the records that document how well a structure was protected from flood damage. Credit will be given if copies of such documents (in digital, scanned, or paper format) are stored at a site out of the floodplain and at least 1 mile away. The records must be transferred or copied to the off-site storage location at least once each year.

A “secure location” means a site protected from fire, theft, and natural hazards (including a category 5 hurricane). The site must not be subject to a flood hazard, i.e., a mapped Special Flood Hazard Area, an X Zone location subject to local drainage problems, or a basement with a known sewer backup problem. The community may submit a site that does not meet all of these criteria (e.g., it is less than one mile away) if it can demonstrate that the site is secure from fire, theft, flood, and other natural hazards (including a category 5 hurricane).

## 312 Impact Adjustment

a. Option 1:

1. If the community has elevation certificates for ALL post-FIRM buildings in its SFHA, rECPO = 1.0.

- If no buildings have been built or substantially improved in the SFHA since the community entered the Regular Program of the NFIP, rECPO = 1.0.
2. If the community has elevation certificates for ALL pre-FIRM buildings in its SFHA, rECPR = 1.0.
- If there are no pre-FIRM buildings in the SFHA, rECPR = 1.0.
3. If the community has entered all of its elevation certificates into a computer format, rECCF = 1.0.
  4. If the community has posted all of its elevation certificate data onto a website, rECWS = 1.0.

**NOTE:** *There is no impact adjustment for EC. The community must keep elevation certificates for ALL new or substantially improved buildings in the floodplain after the date it first applies for the CRS. There is no impact adjustment for ORS.*

- b. Option 2:
1. If the community has elevation certificates for at least 25% of the post-FIRM buildings in its SFHA, rECPO = 0.25.
  2. If the community has elevation certificates for at least 25% of the pre-FIRM buildings in its SFHA, rECPR = 0.25.
  3. If the community has entered at least 25% of its elevation certificates into a computer format, rECCF = 0.25.
  4. If the community has posted at least 25% of its elevation certificate data onto a website, rECWS = 0.25.
- c. Option 3:
1.  $rECPO = \frac{bECPO}{bPO}$  , where
- bECPO = the number of post-FIRM buildings with elevation certificates
- bPO = the number of buildings built or substantially improved in the community's SFHA between the initial FIRM effective date and the date the community applied to the CRS.

$$2. \text{ rECPR} = \frac{\text{bECPR}}{\text{bPR}}, \text{ where}$$

bECPR = the number of pre-FIRM buildings with elevation certificates

bPR = the number of pre-FIRM buildings in the community's SFHA.

$$3. \text{ rECCF} = \frac{\text{bECCF}}{\text{bEC} + \text{bECPO} + \text{bECPR}}, \text{ where}$$

bECCF = the number of buildings with elevation certificates in computer format

bEC = the number of buildings in the SFHA since the initial CRS application date.

$$4. \text{ rECWS} = \frac{\text{bECWS}}{\text{bEC} + \text{bECPO} + \text{bECPR}}, \text{ where}$$

bECWS = the number of buildings with complete elevation certificate data posted on the website.

ECPO and ECPR are adjusted to reflect the number of buildings with elevation certificates. Section 301 includes a detailed discussion of the determination of bPO and bPR.

ECCF is adjusted if the community has not entered all elevation certificates into its computer data base. ECWS is adjusted if the community has not entered all its elevation certificate data onto the website.

There is no adjustment for EC because the community must maintain elevation certificates on all buildings constructed in the SFHA after the date it applied for CRS classification. However, the community may not have certificates on all post-FIRM or all pre-FIRM buildings. Accordingly, ECPO and ECPR can be adjusted to reflect the number of buildings that are affected. Similarly, ECCF and ECWS are adjusted if the community has not entered all elevation certificates into its computer data base or website.

These adjustments are made by dividing the number of buildings with elevation certificates by the number of buildings that could have certificates to produce an "r" variable that represents the ratio of buildings affected. Sections 302 and 303 explain how to obtain the building counts needed to calculate these impact adjustments.

*NOTE: See the definitions of "building," "SFHA," and "Zone A" in the Glossary, Section 130. Also see Section 301.*

**Example 312.c-1.** Floodville applied for CRS credit in late 1993. Its credit was verified by its ISO/CRS Specialist during the spring of 1994. The examples for Activity 310 show the CRS credit that was verified during that visit. Floodville applied for 56 points for maintaining elevation certificates since its application date (EC); 14 points for having elevation certificates for at least 25% of its post-FIRM elevation

buildings (ECPO); and 4 points for having elevation certificates for at least 25% of its pre-FIRM buildings. Although it started using the elevation certificate software after it applied for the CRS, it did not have at least 25% of its certificates entered when it applied. Its total application credit for Activity 310 was 74.

Floodville's initial FIRM effective date is May 15, 1980. Between then and when it applied to the CRS in 1993, 22 buildings were built or substantially improved: bPO = 22.

Floodville began using FEMA's elevation certificates after FEMA conducted a community assistance visit in 1986. It has completed certificates for all buildings built since then. There are 10 such buildings: bECPO = 10.

$$\text{rECPO} = \frac{10}{22} = 0.45$$

There are 250 pre-FIRM buildings in Floodville: bPR = 250. As part of a flood control study, the U.S. Army Corps of Engineers surveyed the first floor elevations of all buildings in one of Floodville's floodplains. Because there are no basements in Floodville, the first floor is the same as the lowest floor. [NOTE: this is not always the case; other sources of elevation data must be carefully checked to ensure that the records are for the lowest floor.] The study provided elevations for 122 of Floodville's 250 pre-FIRM buildings, and the city has subsequently recorded the data on FEMA's elevation certificates: bECPR = 122.

$$\text{rECPR} = \frac{122}{250} = 0.49$$

When it applied for the CRS, Floodville began using the CRS computer program for maintaining elevation certificates. It also entered all of its post-FIRM and its pre-FIRM elevation and floodproofing certificates in this program. Because data from all of the community's certificates were in computer format by the time of the verification visit, credit was verified using Option 1: rECCF = 1.0.

### 313 Credit Calculation

a.  $\text{cEC} = 56$

b.  $\text{cECPO} = \text{ECPO} \times \text{rECPO}$

**Example 313.b-1.** Floodville has elevation certificates for 10 of its 22 post-FIRM buildings. As discussed above: rECPO = 0.45.

$$\text{cECPO} = 56 \times 0.45 = 25.2$$

$$c. \text{ cECPR} = \text{ECPR} \times \text{rECPR}$$

**Example 313.c-1.** Floodville has elevation certificates for 122 of its 250 pre-FIRM buildings. As discussed above:  $\text{rECPR} = 0.49$ .

$$\text{cECPR} = 15 \times 0.49 = 7.35$$

$$d. \text{ cECCF} = \text{ECCF} \times \text{rECCF}$$

**Example 313.d-1.** Floodville entered all of its elevation and floodproofing certificates in computer format. It also checked them all and made sure that each one has a full street address.  $\text{ECCF} = 10 + 5 = 15$ . As discussed above:  $\text{rECCF} = 1.0$

$$\text{cECCF} = 15 \times 1.0 = 15.0$$

$$e. \text{ cECWS} = \text{ECWS} \times \text{rECWS}$$

$$f. \text{ cORS} = \text{ORS}$$

$$g. \text{ c310} = \text{cEC} + \text{cECPO} + \text{cECPR} + \text{cECCF} + \text{cECWS} + \text{ORS}$$

**Example 313.e-1.** Floodville applies for participation in the CRS so it must apply for this activity. The mayor certifies that the city will continue to use the FEMA elevation certificates so the city receives the 56 points in the formula. As calculated above,  $\text{cECPO} = 25.2$ ,  $\text{cECPR} = 7.35$ , and  $\text{cECCF} = 15$ . The city has not put elevation certificates on a website, so  $\text{cECWS} = 0$ . The city does not yet have off-site storage for its records, so  $\text{cORS} = 0$ .

Floodville's first activity worksheet is shown in Figure 310-1a.

$$\text{C310} = 56 + 25.2 + 7.35 + 15 + 0 = 103.55, \text{ which is rounded to } 104.$$



Ten buildings have been built or substantially improved in the floodplain since the 1993 CRS application. During the verification visit, the ISO/CRS Specialist examines the elevation certificates for these buildings. A surveyor who completed one of the certificates recorded the wrong FIRM Zone and the wrong base flood elevation. This reduces Floodville's credit for EC from 56 to 50.4.

Similar sampling for post-FIRM and pre-FIRM certificates found no other errors. However, the sample taken for ECCF also found one error, which reduces that credit from 15 to 13.5.

Floodville's final verified credit for Activity 310 is:

$$c310 = 50.4 + 25.2 + 7.35 + 13.5 + 0 + 0 = 96.45, \text{ which is rounded to } 96.$$

### 314 Credit Documentation

The community must have the following to verify implementation of this activity:

- a. [If the community applies for credit under Section 311.b (ECPO) or c (ECPR) and it used a form different from FEMA's] A copy of its elevation certificate, along with documentation that FEMA has approved it. Note that a local elevation certificate can only be credited if it was used before the 1999 FEMA elevation certificate was published or before the community joined the CRS, whichever is later.

If the community used a non-FEMA form in the past and began using the FEMA form when it applied for the CRS or when the 1999 FEMA form went into effect, the written statement is required to obtain credit for ECPO and/or ECPR.

- b. [If the community applies for credit under Section 311.d.1 and is NOT using the CRS "Computerized Format for FEMA Elevation Certificates"] A copy of the computer format being used.

The CRS computer format is available at no cost (see Appendix E).

- c. Copies of all completed elevation certificates that the community wants credited for EC, ECPR, or ECPO. Sample copies of the digital or website versions will be collected to document credit for ECCF and ECWS.
- d. Documentation showing how the impact adjustment ratios were determined and a description of how the community maintains, stores, and provides copies of elevation certificates to inquirers. If the community is applying for credit for off-site

record storage (ORS) under Section 311.f, the documentation must describe the off-site storage location and arrangements for copying key files for that location..

The community must maintain certificates on all buildings built, substantially improved, or placed in the floodplain since the initial application date and make them available. The community should maintain its elevation certificates so they are easy to retrieve during the verification visit.

The community must submit the following with its annual CRS recertification:

- e. A disk with the elevation and floodproofing certificate data in computer format obtained since the last submittal, if applying for credit for ECCF under Section 311.d. If the community is receiving credit for other than the FEMA-issued elevation certificate software, the submittal must include a key that explains each data item.

### 315 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. The FEMA elevation and floodproofing certificates include detailed instructions for completing them. The latest version can be downloaded from FEMA's website at <http://www.fema.gov/nfip/elvinst.shtm>. The FEMA Regional Office can provide help in completing and maintaining them (see Appendix A).
- b. *Elevation Certificate*, FEMA's Floodplain Management Bulletin 467-1, provides questions and answers on completing the form and using the elevation certificate to verify building compliance. The bulletin can be downloaded from <http://www.fema.gov/pdf/fima/fema467-6-10-04.pdf>.
- c. The U.S. Army Corps of Engineers can provide advice on obtaining and maintaining elevation records. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps.
- d. A free program, "Computerized Format for FEMA Elevation Certificates," (see Appendix E) requires an IBM-compatible computer with a CD or 3.5-inch disk drive.
- e. FEMA has developed interactive tutorials for surveyors and insurance agents. The surveyor's tutorial is especially helpful for local officials because it discusses how to complete the form. It can be found at <http://training.nfipstat.com/ecsurveyor/>. The insurance agent's tutorial covers how agents use the form. It can be found at <http://training.nfipstat.com>.

Community : FLOODVILLE

**310 ELEVATION CERTIFICATES**

**312 Impact Adjustment:**

a. Option 1:

1. rECPO = 1.0    2. rECPR = 1.0    3. rECCF = 1.0    4. rECWS = 1.0

b. Option 2:

1. rECPO = 0.25    2. rECPR = 0.25    3. rECCF = 0.25    4. rECWS = 0.25

c. Option 3:

1. rECPO =  $\frac{bECPO}{bPO} = \frac{10}{22} = 0.45$     2. rECPR =  $\frac{bECPR}{bPR} = \frac{122}{250} = 0.49$

3. rECCF =  $\frac{bECCF}{bEC + bECPO + bECPR} = \frac{\quad}{\quad + \quad + \quad} = \quad$

4. rECWS =  $\frac{bECWS}{bEC + bECPO + bECPR} = \frac{\quad}{\quad + \quad + \quad} = \quad$

**313 Credit Calculation:**

a. cEC

cEC = 56

b. cECPO = ECPO 56 x rECPO 0.45

cECPO = 25.2

c. cECPR = ECPR 15 x rECPR 0.49

cECPR = 7.35

d. cECCF = ECCF 15 x rECCF 1.0

cECCF = 15.0

e. cECWS = ECWS \_\_\_\_\_ x rECWS \_\_\_\_\_

cECWS = 0

f. cORS = ORS

cORS = 0

g. Add lines a through f above =

103.55

c310 = value above rounded to the nearest whole number:

c310 = 104

Enter this value on AW-720-1.

**Figure 310-1a. Floodville's completed activity worksheet for elevation certificates, page one (AW-310-1).**

OMB No.1660-0022  
Expires June 30, 2010

Community : FLOODVILLE

**314 Credit Documentation:**

- a. [If the community applies for credit under ECPO or ECPR and used a form different from FEMA's] A copy of the local elevation certificate, along with documentation that FEMA has approved it. Note that a local elevation certificate can only be credited if it was used before 1999 or before the community joined the CRS, whichever is later.
- b. [If the community applies for ECCF credit and is NOT using the CRS "Computerized Format for FEMA elevation certificates"] a copy of the computer format being used.
- c. EC – Copies of completed elevation certificates  
OR  
Certification letter if no new construction or substantial improvements.
- ECPO – Copies of completed post-FIRM elevation certificates.
- ECPR – Copies of completed pre-FIRM elevation certificates.
- ECCF – Printout of sample Certificates.
- ECWS – Printout of sample Certificates. Website address \_\_\_\_\_
- d. Documentation showing how the impact adjustment ratios were determined and how the community maintains, stores, and provides copies of elevation certificates.

**The following will be needed at the annual recertification:**

- e. ECCF – A disk with the elevation and floodproofing certificate data in computer format obtained since the last submittal.

Starting month/year for which certificates are consistently available: Nov 1, 1993

Office where requests should be submitted: BUILDING DEPARTMENT

Address 3900 HUNTER

City FLOODVILLE State ST Zip 98765

Phone 101-555-1234 Fax 101-555-1201 e-mail bldg.dept@floodville.st.us

How should requests for elevation and/or floodproofing certificates be submitted (mail, phone, fax, etc.)? mail, phone, fax

Comments:

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**Figure 310-1b. Page two of Floodville's completed activity worksheet for elevation certificates (AW-310-2).**

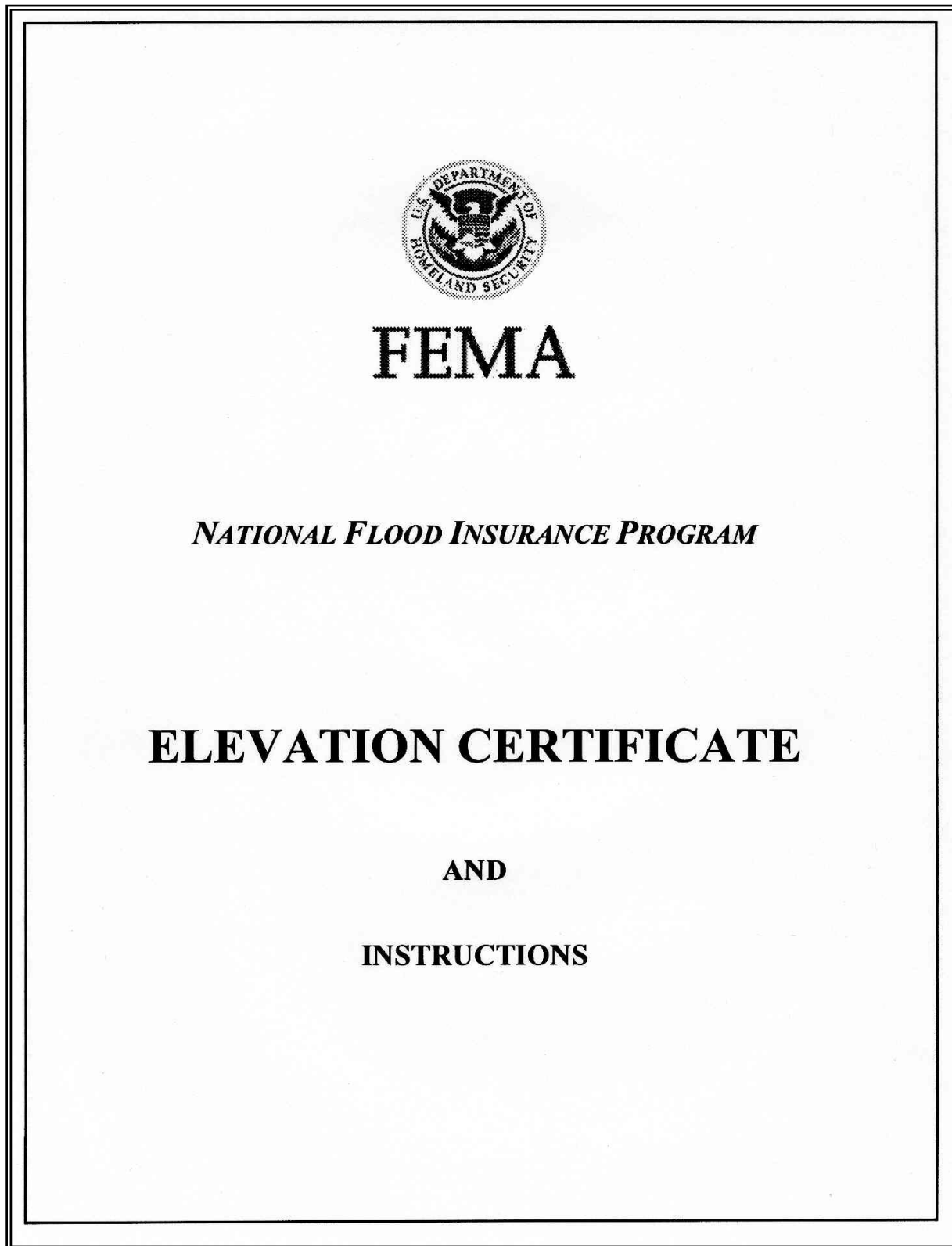


Figure 310-2a. Cover page of FEMA's elevation certificate.

## NATIONAL FLOOD INSURANCE PROGRAM ELEVATION CERTIFICATE

### PAPERWORK REDUCTION ACT NOTICE

Public reporting burden for the Elevation Certificate is estimated to average 3.5 hours per response. Burden means the time, effort, or financial resources expended by persons to generate, maintain, retain, disclose, or provide information to the Federal Emergency Management Agency (FEMA). You are not required to respond to the collection of information unless a valid OMB control number is displayed in the upper right corner of the form. You may send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: U.S. Department of Homeland Security, Federal Emergency Management Agency, Mitigation Division, 500 C Street SW, Washington DC 20472, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.** To obtain or retain benefits under the National Flood Insurance Program (NFIP), you must respond to this collection of information.

### PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance that specifies minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in the FEMA Floodplain Management Bulletin about using the Elevation Certificate, available on FEMA's website at [www.fema.gov/fima/fpmbul.shtm](http://www.fema.gov/fima/fpmbul.shtm). Click on "FEMA 467-1 Elevation Certificate Cover and Bulletin."

**Figure 310-2b. Inside cover of FEMA's elevation certificate.**

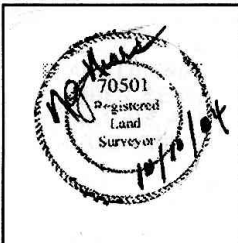
U.S. DEPARTMENT OF HOMELAND SECURITY Federal Emergency Management Agency National Flood Insurance Program		<b>ELEVATION CERTIFICATE</b> Important: Read the instructions on pages 1-8.	OMB No. 1660-0008 Expires February 28, 2009
<b>SECTION A - PROPERTY INFORMATION</b>			For Insurance Company Use:
A1. Building Owner's Name <u>William Smith</u>		Policy Number	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. <u>3802 Woodbridge Road</u>		Company NAIC Number	
City <u>Floodville</u>	State <u>ST</u>	ZIP Code <u>98765</u>	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) <u>Lot 3, Block 4, Foster Creek Addition</u>			
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) <u>Residential</u>			
A5. Latitude/Longitude: Lat. _____ Long. _____		Horizontal Datum: <input type="checkbox"/> NAD 1927 <input type="checkbox"/> NAD 1983	
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.			
A7. Building Diagram Number <u>1</u>			
A8. For a building with a crawl space or enclosure(s), provide:		A9. For a building with an attached garage, provide:	
a) Square footage of crawl space or enclosure(s) _____ sq ft	b) No. of permanent flood openings in the crawl space or enclosure(s) walls within 1.0 foot above adjacent grade _____	a) Square footage of attached garage _____ sq ft	b) No. of permanent flood openings in the attached garage walls within 1.0 foot above adjacent grade _____
c) Total net area of flood openings in A8.b _____ sq in		c) Total net area of flood openings in A9.b _____ sq in	
<b>SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION</b>			
B1. NFIP Community Name & Community Number <u>Floodville 123456</u>		B2. County Name <u>Isler</u>	
		B3. State <u>ST</u>	
B4. Map/Panel Number <u>123456</u>	B5. Suffix <u>0001</u>	B6. FIRM Index Date <u>5/15/80</u>	B7. FIRM Panel Effective/Revised Date <u>5/15/80</u>
		B8. Flood Zone(s) <u>A15</u>	B9. Base Flood Elevation(s) (Zone AO, use base flood depth) <u>1142.8</u>
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9. <input checked="" type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other (Describe) _____			
B11. Indicate elevation datum used for BFE in Item B9: <input checked="" type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other (Describe) _____			
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Designation Date _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA			
<b>SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)</b>			
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input checked="" type="checkbox"/> Finished Construction *A new Elevation Certificate will be required when construction of the building is complete.			
C2. Elevations - Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7. Benchmark Utilized <u>NGS 14-21</u> Vertical Datum <u>NGVD 29</u> Conversion/Comments <u>N/A</u>			
Check the measurement used.			
a) Top of bottom floor (including basement, crawl space, or enclosure floor)	<u>1145.0</u>	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
b) Top of the next higher floor	<u>N/A</u>	<input type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
c) Bottom of the lowest horizontal structural member (V Zones only)	<u>N/A</u>	<input type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
d) Attached garage (top of slab)	<u>1144.6</u>	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments)	<u>1144.6</u>	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
f) Lowest adjacent (finished) grade (LAG)	<u>1144.2</u>	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
g) Highest adjacent (finished) grade (HAG)	<u>1144.5</u>	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
<b>SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION</b>			
This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.			
<input checked="" type="checkbox"/> Check here if comments are provided on back of form.			
Certifier's Name <u>N.G. Nears</u>		License Number <u>70501</u>	
Title <u>Registered Land Surveyor</u>	Company Name <u>Nears &amp; Co.</u>		
Address <u>4305 W. St. Paul</u>	City <u>Floodville</u>	State <u>ST</u>	ZIP Code <u>98765</u>
Signature <u>NG Nears</u>	Date <u>10/10/04</u>	Telephone <u>101/555-0704</u>	
			
FEMA Form 81-31, February 2006		See reverse side for continuation.	
Replaces all previous editions			

Figure 310-2c. FEMA's elevation certificate, page one.

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>		For Insurance Company Use:	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. <u>3802 Woodbridge Road</u>		Policy Number	
City <u>Floodville</u>	State <u>ST</u>	ZIP Code <u>98765</u>	Company NAIC Number

**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)**

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

Comments  
C.3.e. heat pump + water heater located inside attached garage

Signature Ngman Date 10/10/04  Check here if attachments

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

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

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).  
a) Top of bottom floor (including basement, crawl space, or enclosure) is \_\_\_\_\_  feet  meters  above or  below the HAG.  
b) Top of bottom floor (including basement, crawl space, or enclosure) is \_\_\_\_\_  feet  meters  above or  below the LAG.

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

E3. Attached garage (top of slab) is \_\_\_\_\_  feet  meters  above or  below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is \_\_\_\_\_  feet  meters  above or  below the HAG.

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

**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge.*

Property Owner's or Owner's Authorized Representative's Name \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP Code \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_ Telephone \_\_\_\_\_

Comments \_\_\_\_\_

Check here if attachments

**SECTION G - COMMUNITY INFORMATION (OPTIONAL)**

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8, and G9.

G1.  The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2.  A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3.  The following information (Items G4.-G9.) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued
-------------------	------------------------	---

G7. This permit has been issued for:  New Construction  Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: \_\_\_\_\_  feet  meters (PR) Datum \_\_\_\_\_

G9. BFE or (in Zone AO) depth of flooding at the building site: \_\_\_\_\_  feet  meters (PR) Datum \_\_\_\_\_

Local Official's Name \_\_\_\_\_ Title \_\_\_\_\_

Community Name \_\_\_\_\_ Telephone \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Comments \_\_\_\_\_

Check here if attachments

FEMA Form 81-31, February 2006 Replaces all previous editions

Figure 310-2d. Page two of FEMA's elevation certificate.



<b>Building Photographs</b>			For Insurance Company Use:
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number
City	State	ZIP Code	Company NAIC Number
<p>If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page, following.</p>			

Figure 310-2e. Page three of FEMA's elevation certificate.

### Building Photographs

Continuation Page

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use:
			Policy Number
City	State	ZIP Code	Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."

**Figure 310-2f. Page four of FEMA's elevation certificate.**

## INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

### SECTION A – PROPERTY INFORMATION

**Items A1.-A4.** This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

**Item A5.** Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

**Item A6.** If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least two photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. If the building has split-level or multi-level areas, provide at least two additional photographs showing side views of the building. All photographs must be in color and measure at least 3"x3". Digital photographs are acceptable.

**Item A7.** Select the diagram on pages 7-8 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a-g. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

**Item A8.a** Provide the square footage of the crawl space or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawl space or enclosure(s). Examples of elevated buildings constructed with crawl space and enclosure(s) are shown in Diagrams 6-8 on page 8. Diagram 2 or 4 should be used for a building constructed with a crawl space floor that is below the exterior grade on all sides.

**Items A8.b-c** Enter in Item A8.b the number of permanent flood openings in the crawl space or enclosure(s) walls that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net

**Figure 310-2g. Page one of the instructions to FEMA's elevation certificate.**

area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. If the crawl space or enclosure(s) walls have no permanent openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

**Item A9.a** Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

**Items A9.b-c** Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the adjacent grade. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the garage has no permanent flood openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A9.b-c.

---

### SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

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Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building's location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community's FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the new county in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

**Item B1.** NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA's web site at <http://www.fema.gov/fema/csb.shtml>, or call 1-800-358-9616.

**Item B2.** County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter "unincorporated area." For an independent city, enter "independent city."

**Item B3.** State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

**Items B4.-B5.** Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a four-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

**Item B6.** FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

**Item B7.** FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

**Item B8.** Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1-A30, V, VE, V1-V30, AH, AO, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

**Figure 310-2h.** Page two of the instructions to FEMA's elevation certificate.

**Item B9.** Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1-A30, AE, AH, V1-V30, VE, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Item B10.** Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

**Item B11.** Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

**Item B12.** Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. An information sheet explaining CBRS areas and OPAs may be obtained on FEMA's web site at [http://www.fema.gov/fhmv/fine\\_cbars.shtml](http://www.fema.gov/fhmv/fine_cbars.shtml).

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### SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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Complete Section C if the building is located in any of Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawl spaces to shoot the elevation of the crawl space floor. If access to the crawl space is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawl space to the "next higher floor," and then subtract the crawl space height from the elevation of the "next higher floor." If there is no access to the crawl space, use the exterior grade next to the structure to measure the height of the crawl space to the "next higher floor."
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawl space floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawl space floor to the next higher floor, try to verify this by looking inside the crawl space through any openings or vents.

In all three cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

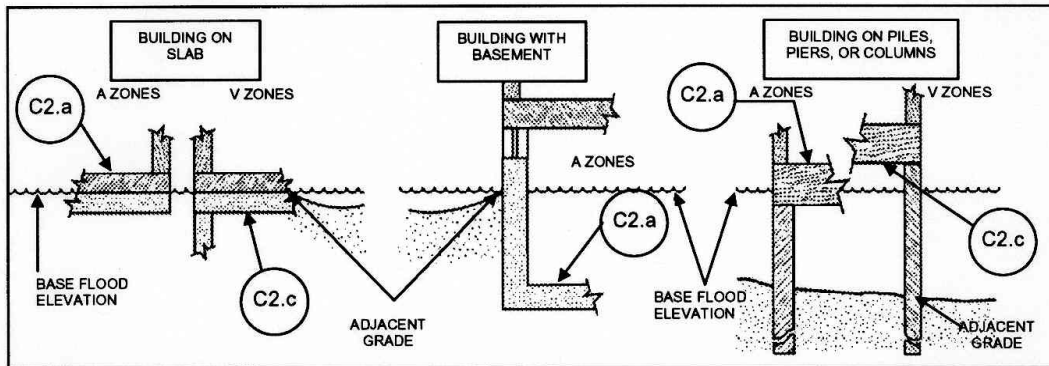
**Item C1.** Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a-g. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

**Item C2.** A field survey is required for Items C2.a-g. Provide the benchmark utilized, the vertical datum for that benchmark, and any datum conversion necessary. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other

**Figure 310-2i.** Page three of the instructions to FEMA's elevation certificate.

unique identifier assigned by the maintainer of the benchmark. Also provide the vertical datum for the benchmark elevation. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. All elevations for the certificate, including the elevations for Items C2.a-g, must be referenced to the datum on which the BFE is based. Show the datum conversion, if applicable, in this section or in the Comments area of Section D. For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a-g to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Items C2.a-d** Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7.) in Items C2.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a-g. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawl space, Diagram 8, enter the elevation of the top of the crawl space floor in Item C2.a, whether or not the crawl space has permanent flood openings (flood vents). *If any item does not apply to the building, enter "N/A" for not applicable.*



**Item C2.e** Enter the lowest platform elevation of at least one of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type in the Comments area of Section D or Section G, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

**Items C2.f-g** Adjacent grade is defined as the elevation of the ground, sidewalk, patio slab, or deck support immediately next to the building. If the certificate is to be used to support a request for a LOMA or LOMR-F, provide in the Comments area the lowest adjacent grade elevation measured at the deck support or stairs if that elevation is lower than the building's lowest adjacent grade. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

#### SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable

Figure 310-2j. Page four of the instructions to FEMA's elevation certificate.

by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, or other relevant information not specified on the front.

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

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Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1.- E4. is based on the "natural grade."

**Items E1.a and b** Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

**Item E2.** For Building Diagrams 6-8 with permanent flood openings (see page 8), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

**Item E3.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

**Item E4.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter "N/A" for not applicable.*

**Item E5.** For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community's floodplain management ordinance.

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**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

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Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner's representative who provided the information on the certificate.

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**SECTION G - COMMUNITY INFORMATION (OPTIONAL)**

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Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1.** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/A1-A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2.** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

**Figure 310-2k. Page five of the instructions to FEMA's elevation certificate.**

Check **Item G3**, if the information in Items G4.-G9. has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4.-G9. provide a way to document these determinations.

**Item G4.** Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

**Item G5.** Date Permit Issued. Enter the date the permit was issued for the building.

**Item G6.** Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

**Item G7.** New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

**Item G8.** As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

**Item G9.** BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

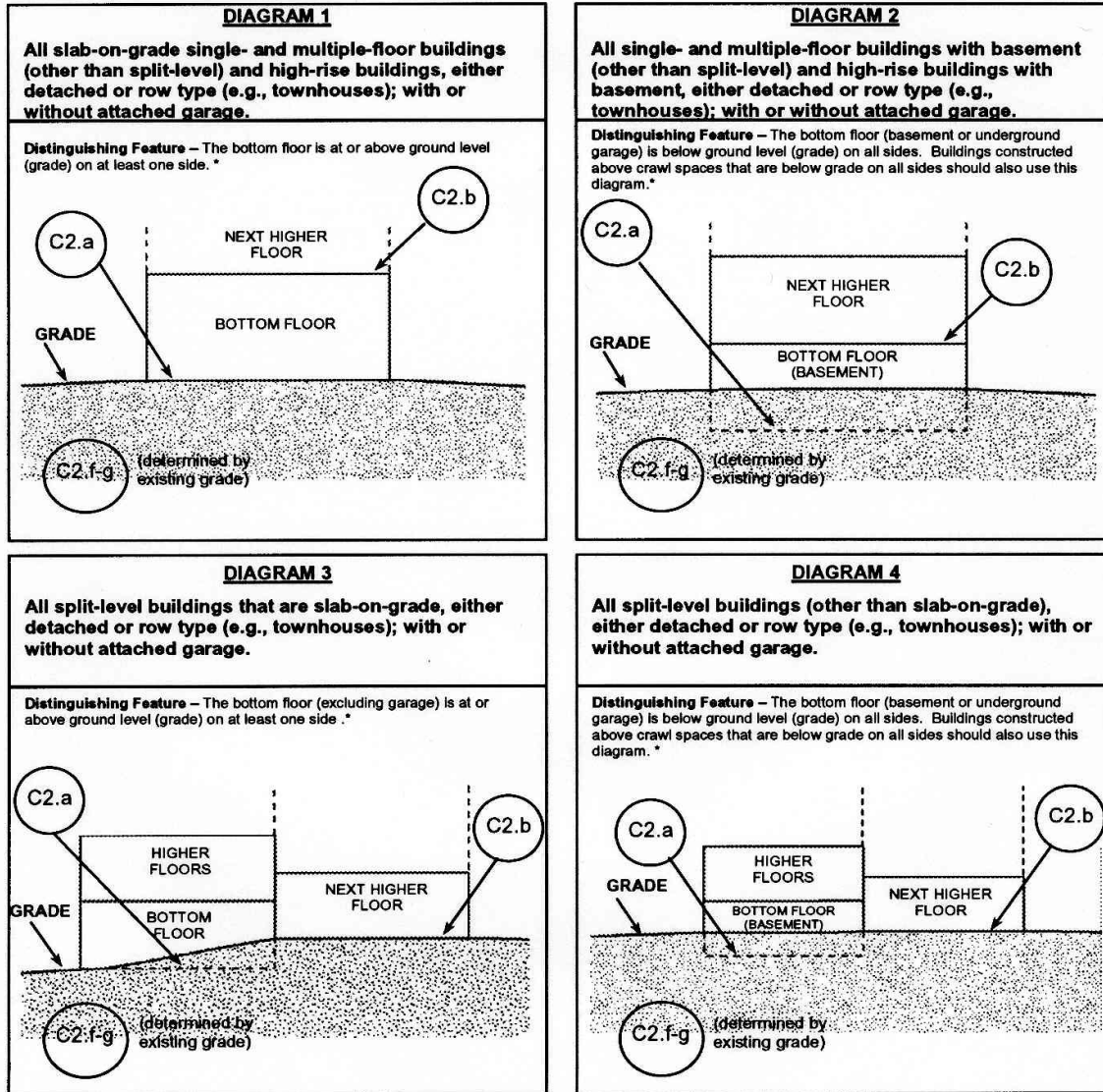
**Figure 310-21. Page six of the instructions to FEMA's elevation certificate.**



### BUILDING DIAGRAMS

The following eight diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7., the square footage of crawl space or enclosure(s) and the area of flood openings in square inches in Items A8.a-c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a-c, and the elevations in Items C2.a-g.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).



\* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

Figure 310-2m. Page seven of the instructions to FEMA’s elevation certificate.

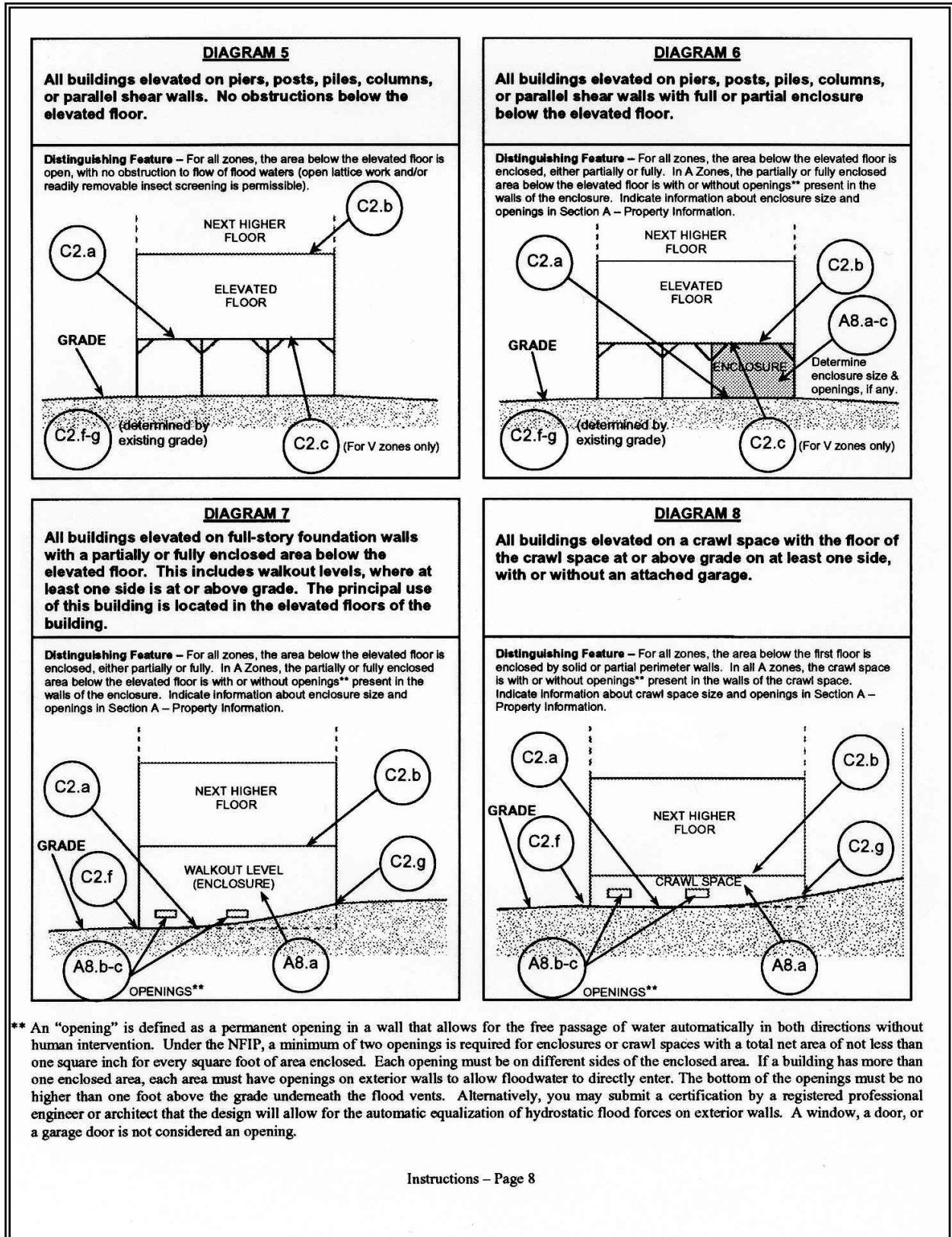


Figure 310-2n. Page eight of the instructions to FEMA’s elevation certificate.

O.M.B. NO. 3067-0077  
 Expires December 31, 2005

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 NATIONAL FLOOD INSURANCE PROGRAM  
**FLOODPROOFING CERTIFICATE**  
 FOR NON-RESIDENTIAL STRUCTURES

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*The floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation; however, a floodproofing design certification is required. This form is to be used for that certification. Floodproofing of a residential building does not alter a community's floodplain management elevation requirements or affect the insurance rating unless the community has been issued an exception by FEMA to allow floodproofed residential basements. The permitting of a floodproofed residential basement requires a separate certification specifying that the design complies with the local floodplain management ordinance.*

BUILDING OWNER'S NAME _____  STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. Number) OR P.O. ROUTE AND BOX NUMBER _____  OTHER DESCRIPTION (Lot and Block Numbers, etc.) _____  CITY _____ STATE _____ ZIP CODE _____	FOR INSURANCE COMPANY USE POLICY NUMBER _____  COMPANY NAIC NUMBER _____
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**SECTION I FLOOD INSURANCE RATE MAP (FIRM) INFORMATION**

Provide the following from the proper FIRM:

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM INDEX	FIRM ZONE	BASE FLOOD ELEVATION (In AO Zones, Use Depth)
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**SECTION II FLOODPROOFING INFORMATION (By a Registered Professional Engineer or Architect)**

**Floodproofing Design Elevation Information:**

Building is floodproofed to an elevation of ..... feet NGVD. (Elevation datum used must be the same as that on the FIRM.)

Height of floodproofing on the building above the lowest adjacent grade is ..... feet.

*(NOTE: for insurance rating purposes, the building's floodproofed design elevation must be at least one foot above the Base Flood Elevation to receive rating credit. If the building is floodproofed only to the Base Flood Elevation, then the building's insurance rating will result in a higher premium.)*

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**SECTION III CERTIFICATION (By Registered Professional Engineer or Architect)**

**Non-Residential Floodproofed Construction Certification:**

*I certify that, based upon development and/or review of structural design, specifications, and plans for construction, the design and methods of construction are in accordance with accepted standards of practice for meeting the following provisions:*

The structure, together with attendant utilities and sanitary facilities, is watertight to the floodproofed design elevation indicated above, with walls that are substantially impermeable to the passage of water.

All structural components are capable of resisting hydrostatic and hydrodynamic flood forces, including the effects of buoyancy, and anticipated debris impact forces.

*I certify that the information on this certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

CERTIFIER'S NAME _____	LICENSE NUMBER (or Affix Seal) _____
TITLE _____	COMPANY NAME _____
ADDRESS _____	CITY _____ STATE _____ ZIP CODE _____
SIGNATURE _____	DATE _____ PHONE _____

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Copies should be made of this Certificate for: 1) community official, 2) insurance agent/company, and 3) building owner.

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FEMA Form 81-65, JAN 03
Replaces all previous editions
F-056 (1/03)

**Figure 310-3. FEMA's floodproofing certificate.**

U.S. DEPARTMENT OF HOMELAND SECURITY FEDERAL EMERGENCY MANAGEMENT AGENCY National Flood Insurance Program		<b>RESIDENTIAL BASEMENT FLOODPROOFING CERTIFICATE</b>			See Reverse Side for Paperwork Burden Disclosure	O.M.B. No. 1660-0033 Expires April 30, 2007
For use ONLY in communities which have been granted an exception by FEMA to allow the construction of floodproofed residential basements in Special Flood Hazard Areas.						
BUILDING OWNER'S NAME				FOR INSURANCE COMPANY USE		
BUILDING STREET ADDRESS (Including Apt., Unit, Number)				POLICY NUMBER		
				COMPANY NAIC NUMBER		
OTHER DESCRIPTION (Lot and Block Numbers, etc.)						
CITY		STATE		ZIP CODE		
SECTION I-FLOOD INSURANCE RATE MAP (FIRM) INFORMATION						
Provide the following from the FIRM and flood profile (from Flood Insurance Study)						
COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM	FIRM ZONE	BASE FLOOD ELEVATION (NGVD) (IN AO ZONES, USE DEPTH)	NAME OF FLOODING SOURCE(S) AFFECTING BUILDING
SECTION II-FLOODPROOFING INFORMATION (By a Registered Professional Engineer or Architect)						
<p><b>Floodproofing Design Elevation Information:</b></p> <p>Building is floodproofed to an elevation of _____ feet NGVD. (Elevation datum used must be the same as that on the FIRM.)</p> <p>Elevation of the top of the basement floor is _____ feet NGVD.</p> <p>(Note: The floodproofing design elevation must be at least one foot above the Base Flood Elevation (BFE))</p>						
SECTION III-CERTIFICATION (By a Registered Professional Engineer or Architect)						
<p><b>Residential Floodproofed Basement Construction Certification:</b></p> <p><i>I certify that, based upon development and/or review of structural design specifications, and plans for construction, including consideration of the depth, velocity, and duration of flooding and the type and permeability of soils at the site, the design and methods of construction of the floodproofed basement to be used are in accordance with accepted standards of practice for meeting the following provisions:</i></p> <ul style="list-style-type: none"> <li>• Basement, together with attendant utilities and sanitary facilities, is watertight to the floodproofing design elevation with walls that are impermeable to the passage of water without human intervention; and</li> <li>• Basement walls and floor are capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy resulting from flooding to the floodproofing design elevation; and have been designed so that minimal damage will occur from floods that exceed the floodproofing design elevation; and</li> <li>• Building design, including the floodproofing design elevation, complies with community requirements.</li> </ul>						
<p><i>I certify that the information on this certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code Section 1001.</i></p>						
CERTIFIER'S NAME				LICENSE NUMBER (or affix Seal)		
TITLE			COMPANY NAME			
ADDRESS			CITY	STATE	ZIP	
SIGNATURE				PHONE NO.	DATE	
Copies of this certificate must be given to: 1) the community official; 2) the insurance agent; and 3) the building owner.						
FEMA Form 81-78, May 04						
F-200 (05/04)						

**Figure 310-4. FEMA’s residential basement floodproofing certificate.**

<b>Communities Approved for Residential Basement Floodproofing Rating Credit</b>			
STATE/COMMUNITY NAME	EFFECTIVE DATE <sup>1</sup>	STATE/COMMUNITY NAME	EFFECTIVE DATE <sup>1</sup>
<b>Alaska</b>		<b>New York</b>	
Fairbanks	2/28/73	Amherst	11/20/78
<b>Idaho</b>		Clarence, Town of	8/1/00
Ammon	6/8/90	<b>North Dakota</b>	
<b>Iowa</b>		Barnes Township	1/22/82
Clive	4/24/81	Casselton	6/18/81
Independence	9/7/89	Fargo	3/26/75 <sup>2</sup>
LaPorte City	6/12/89	Grafton	5/21/81
<b>Kansas</b>		Harwood	12/19/85
Colwich	1/17/86	Harwood Township	1/22/82
Derby	2/15/83 <sup>2</sup>	Horace	1/22/82
Great Bend	8/10/83	Mapleton	1/22/82 <sup>2</sup>
Halstead	7/8/83	Oxbow	6/1/92 <sup>2</sup>
Lindsborg	11/7/94	Pleasant Township	5/5/83
Rossville	2/18/92	Reed Township	1/22/82
Salina	3/6/86	Reiles Acres	8/23/82
Saline County	1/14/86	Stanley Township	2/8/82
Sedgwick	5/19/86 <sup>2</sup>	West Fargo	6/5/78
<b>Minnesota</b>		<b>South Dakota</b>	
Alvarado	2/28/85	Madison	8/30/83
Clay County	3/28/75	<b>Wisconsin</b>	
Dilworth	8/29/83	Ashwaubenon	10/27/78
East Grand Forks	5/15/85 <sup>2</sup>	Brown County	2/21/79 <sup>2</sup>
Moorhead	2/12/76	Depere	10/27/78
Roseau, City of	7/23/99	Green Bay	10/27/78
Stephen	5/10/83	Howard	10/27/78
Warren	9/24/82	Shlocton	8/1/98
<b>Nebraska</b>		Village of Allouez	1/11/93 <sup>2</sup>
Fremont	1/25/79		
Grand Island	7/29/80		
Hall County	2/10/80		
Hastings	7/8/83		
North Bend	10/15/98		
Schuyler	9/17/91		
Sidney	12/4/84		
Wood River	1/12/82		

<sup>1</sup> Effective date corresponds to the date of FEMA's letter to the community granting the exception request.  
<sup>2</sup> The date the community adopted floodproofing ordinances.

**Figure 310-5. Communities approved for residential basement floodproofing rating credit.**

## 320 MAP INFORMATION SERVICE

### Summary of Activity 320

**321 Credit Points.** There is one element in this activity for a maximum of 140 points.

Map Information (MI) Service: up to 140 points are provided if the community or other qualified agency:

1. Provides Flood Insurance Rate Map (FIRM) information to inquirers,
2. Provides information on the flood insurance purchase requirement,
3. Provides information on Coastal Barrier Resources System requirements and/or coastal A Zone hazards.
4. Keeps old FIRMs and updates the maps used for the service,
5. Publicizes the service at least once a year,
6. Advises inquirers whether the property is subject to a special flood-related hazard, and
7. Answers questions from the inquirers about related topics such as local floodplain management requirements.

There is no impact adjustment for this activity.

**322 Credit Calculation.** Up to 140 credit points are provided for this activity. The credit points are based on whether all of the prerequisites are met and whether the service is provided through personal contact, a website, or other remote service provider.

**323 Credit Documentation.** The community must have the following documentation available to verify implementation of this activity.

- a. Documentation that shows how the service was publicized.
- b. If another agency provides this service, documentation that the agency agrees to provide the service to all inquirers and it will allow the ISO/CRS Specialist to verify its work.
- c. Records of institutions and agencies that were notified of this service.
- d. A record or log of requests for information. The record must note the date, the FIRM zone, the address or location of the property in question, and whether the inquirer was advised of the insurance purchase requirement and/or coastal A Zone or coastal barrier designation.
- e. Documentation showing how the FIRM is kept updated at least annually. The community must maintain copies of the FIRMs.

**324 For More Information.**

## 320 MAP INFORMATION SERVICE

Credit is provided for providing inquirers with information from the community's Flood Insurance Rate Map (FIRM), including whether a property is in a Special Flood Hazard Area (SFHA), which zone, and its base flood elevation. Credit depends on publicizing this service and advising inquirers about the mandatory flood insurance purchase requirement.

**Background:** This public information service can greatly help a community's residents as well as its banks, insurance agents, real estate agents, and anyone else who needs flood hazard information. It is particularly helpful to those who have trouble reading maps, people from out of town, and those who do not have access to the latest maps.

This activity is also intended to bring other available community resources to bear on each individual situation. Such resources include local topographic, planning, road, and utility maps; geographic information systems; special hazard area maps; permit records; and subdivision plats. Where they are available, these other resources can complement the FIRM as sources of additional flood data or more detailed map information. (NOTE: for compliance with the mandatory purchase requirement, the current FIRM (or Letter of Map Change) is the only legal document allowed to be used by lenders or third party vendors.)

**Activity Description:** There are seven prerequisites for full credit under this activity:

1. If requested, the community must provide all of the following FIRM information:
  - a. Whether the property is in an SFHA,
  - b. The community number,
  - c. The panel number and suffix,
  - d. The date of the FIRM's index (cover panel),
  - e. The FIRM zone, e.g., A, C, X, V, AE, A2, AO, etc.,
  - f. The base flood elevation (the depth in AO Zones) where shown on the FIRM,
  - g. The elevation datum used on the FIRM, if other than NGVD, and
  - h. Whether the property is on an undeveloped coastal barrier or "otherwise protected area" as designated on the FIRM.
2. If the property is in an SFHA, the community must inform the inquirer of the mandatory flood insurance purchase requirement, as appropriate. This may be done by advising the inquirer that flood insurance may be required because of the property's location or by providing a written summary of the requirement (e.g., the example in Figure 320-1).

3. If the community has a map that shows the coastal A Zone or Coastal Barrier Resources System, the service must check on the following and report the findings to the inquirer:
  - a. Whether the property is in a coastal A Zone. If so, the inquirer must be advised that waves and velocity from coastal storms and hurricanes can cause significant damage to a structure that is not properly elevated on an open foundation and protected from erosion and scour.
  - b. Whether the property is in an “undeveloped coastal barrier” or “otherwise protected area” of the Coastal Barrier Resources System. If so, the community must advise the inquirer that flood insurance, federal disaster assistance, and other types of federal financial assistance are not available for buildings constructed or substantially improved after the effective date of designation, as shown on the FIRM.
4. The map used for this service must be kept updated at least annually to reflect new subdivisions, annexations, flood insurance restudies, map revisions, and map amendments (including Letters of Map Amendment (LOMAs) and Letters of Map Revision (LOMRs)). The community must also maintain copies of all FIRMs that have been in effect since 1999 or the date the community applied for this credit, whichever is later.
5. The service must be publicized at least once a year. If the community uses a website for its services, the site’s address or URL must be publicized. The publicity must state that the community also has copies of elevation certificates for some properties in the floodplain.
6. If the community is receiving CRS credit for mapping and regulating one of the special hazard areas described in Section 401, inquirers must be advised if the property falls within a special hazard area and what precautions should be taken when developing or improving the property.
7. The service must provide an opportunity for the inquirer to talk to community staff about map and floodplain management questions.

There are many benefits to providing FIRM information. Residents and businesses that are aware of the potential flood hazard can take steps to avoid problems and/or reduce their exposure to flooding. Communities are the best source of map information because they can often supplement and clarify the FIRM with complementary maps, and with information on additional hazards, flooding outside mapped areas, development regulations that affect floodplain properties, flood insurance, and property protection measures. *NOTE: For compliance with the mandatory purchase requirement, the current FIRM (or Letter of Map Change) is the only legal document allowed to be used by lenders or third party vendors.*

Acceptable methods of providing map information include, but are not limited to:

- Reading the FIRM in response to a telephone call;
- Helping a person who walks into the office read the FIRM;



## **About the Mandatory Purchase of Flood Insurance Requirement**

**NFIP:** This community participates in the National Flood Insurance Program (NFIP), which makes federally backed flood insurance available for all eligible buildings, whether they are in a floodplain or not. Flood insurance covers direct losses caused by surface flooding, including a river flowing over its banks, a lake or ocean storm, and local drainage problems.

The NFIP insures buildings, including mobile homes, with two types of coverage: building and contents. Building coverage is for the walls, floors, insulation, furnace, and other items permanently attached to the structure. Contents coverage may be purchased separately, if the contents are in an insurable building.

**Mandatory Purchase Requirement:** The Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994 made the purchase of flood insurance mandatory for federally backed mortgages on buildings located in Special Flood Hazard Areas (SFHAs). It also affects all forms of Federal or Federally related financial assistance for buildings located in SFHAs. The SFHA is the base (100-year) floodplain mapped on a Flood Insurance Rate Map (FIRM). It is shown as one or more zones that begin with the letter "A" or "V."

The rule applies to secured mortgage loans from such financial institutions as commercial lenders, savings and loan associations, savings banks, and credit unions that are regulated, supervised, or insured by Federal agencies such as the Federal Deposit Insurance Corporation and the Office of Thrift Supervision. It also applies to all mortgage loans purchased by Fannie Mae or Freddie Mac in the secondary mortgage market.

Federal financial assistance programs affected by the laws include loans and grants from agencies such as the Department of Veterans Affairs, Farmers Home Administration, Federal Housing Administration, Small Business Administration, and the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

**How it Works:** Lenders are required to complete a Standard Flood Hazard Determination (SFHD) form whenever they make, increase, extend or renew a mortgage, home equity, home improvement, commercial, or farm credit loan to determine if the building or manufactured (mobile) home is in an SFHA. It is the Federal agency's or the lender's responsibility to check the current Flood Insurance Rate Map (FIRM) to determine if the building is in an SFHA. Copies of the FIRM are available for review in most local government building or planning departments. Lenders may also have copies or they use a flood zone determination company to provide the SFHD form.,

If the building is in a SFHA, the Federal agency or lender is required by law to require the recipient to purchase a flood insurance policy on the building. Federal regulations require building coverage equal to the amount of the loan (excluding appraised value of the land) or the maximum amount of insurance available from the NFIP, whichever is less. The maximum amount available for a single-family residence is \$250,000. Government sponsored enterprises, such as Freddie Mac and Fannie Mae, have stricter requirements.

The mandatory purchase requirement does not affect loans or financial assistance for items that are not covered by a flood insurance policy, such as vehicles, business expenses, landscaping, and vacant lots. It does not affect loans for buildings that are not in an SFHA, even though a portion of the lot may be. While not mandated by law, a lender may require a flood insurance policy, as a condition of a loan, for a property in any zone on a FIRM.

If a person feels that a SFHD form incorrectly places the property in the SFHA, he or she may request a Letter of Determination Review from FEMA. This must be submitted within 45 days of the determination. More information can be found at [http://www.fema.gov/fhm/fq\\_gen11.shtm](http://www.fema.gov/fhm/fq_gen11.shtm).

**Figure 320-1. Handout on mandatory purchase of flood insurance.**

- Completing a form based on a marked-up street map sent in by an inquirer (see example, Figure 320-2). It is recommended that a local form or form letter include a disclaimer like the one in Figure 320-2; or
- Directing an inquirer to a website or other provider of the service, provided that the inquirer can obtain the information by entering a street address. There is no credit for simply having a map on the website or expecting an inquirer to read the map.

The community may charge a reasonable fee for providing map information to cover staff time and office overhead. This service should not include surveying or similar costs to collect new data, such as ground elevations.

To receive credit for this activity, the community's program must meet all seven of the prerequisites. The following comments correspond to these prerequisites.

1. The list in Section 1 of the Activity Description comprises the FIRM information needed to complete most of Section B of the FEMA elevation certificate (see Section 310). A copy of the elevation certificate for the property, if available, can suffice as meeting the minimum requirements. There is no pro-rating for providing only some of the needed map information.

The community need only supply the flood data requested. If the inquirer only wants to know if a building is in a floodplain, then advising whether it is in an SFHA as shown on the FIRM is sufficient. If a property is too close to the SFHA boundary to determine what FIRM zone the building is in, the community may give the inquirer a copy of the FIRM and advise that the FIRM zone cannot be determined based on the map information available.

The community is not required to provide data that do not appear on the FIRM, such as base flood elevations in unnumbered A Zones, but providing additional information from other maps and sources of flood hazard and flood protection information is encouraged.

The community must respond to an information request within a reasonable period of time.

2. If the person performing the map information service finds that a property is in the SFHA, he or she must inform the inquirer about the mandatory flood insurance purchase requirement (see Figure 320-1).
  - An alternative is to provide a summary similar to that in the booklet, "Mandatory Purchase of Flood Insurance Guidelines," FEMA-186, listed in Section 324, For More Information. A third alternative is to hand out a one-page summary, as shown in Figure 320-1. Handouts may be easier for the community to produce and distribute, but they do not necessarily help people who have trouble reading technical material or who want simple answers to simple questions.

**City of Floodville  
Building Department  
City Hall**

Date:

RE: Flood Insurance Rate Map Information

TO WHOM IT MAY CONCERN:

The property located at: \_\_\_\_\_, also  
known as [legal description if needed]\_\_\_\_\_ has  
been located on the city's Flood Insurance Rate Map (FIRM). The following  
information is provided:

Floodville's community number: 123456

The property is located on panel number: \_\_\_\_, Suffix: \_\_\_\_.

The date of the FIRM index: May 15, 1980.

The property is located in FIRM zone: \_\_\_\_.

The main building on the property:

\_\_\_ is located in a Special Flood Hazard Area (SFHA). The base flood elevation  
at the property is: \_\_\_\_\_, NGVD. Federal law requires that a flood zone  
determination be done as a condition of a federally backed mortgage to  
determine if the structure is in an SFHA and if so, to require flood  
insurance. It is up to the lender to determine whether flood insurance is  
required for a property.

\_\_\_ is not located in a Special Flood Hazard Area. However, the property may  
still be subject to local drainage problems or other unmapped flood hazard.  
Flood insurance from the NFIP is available at non-floodplain rates. A flood  
insurance policy can still be required by a lender.

\_\_\_ A decision about the building's exact location cannot be made on the FIRM.  
A copy of the FIRM is attached for your information.

Flood insurance from the NFIP is available for any property in Floodville.  
More information on flood insurance is attached. This office has copies of  
FEMA Elevation Certificates for all buildings constructed in the SFHA since  
1990. Questions on this letter and the City's floodplain management program  
are welcome at this office by calling 555-123-1234.

NOTE: This information is based on the Flood Insurance Rate Map for the City.  
This letter does not imply that the referenced property will or will not be  
free from flooding or damage. A property not in a Special Flood Hazard Area  
may be damaged by a flood greater than that predicted on the FIRM or from a  
local drainage problem not shown on the map.

\_\_\_\_\_  
Building Official

**Figure 320-2. Floodville's map information record.**

*NOTE: If Floodville was a coastal community with designated undeveloped coastal barriers, this record would have a section on whether the property was in such an area.*

Communities should be aware that federally regulated lenders are legally responsible for determining if a flood insurance policy is required for a loan. Under the National Flood Insurance Reform Act of 1994, if a “third party vendor,” i.e., someone other than a lender, provides map information to decide if a flood insurance policy is required for a loan, the information must be guaranteed. Communities are not considered third party vendors. This activity credits providing map information to inquirers. It is not intended to encourage communities to assume the lender’s responsibility. See also Figure 320-3.

### **Flood Hazard Determination Review**

Activity 320 credits a map information service provided by the community. The mandatory purchase requirement places the responsibility on lenders to determine whether to require a flood insurance policy as a condition of a loan (see Figure 320-1). Many lenders hire map determination companies as third party vendors to assist them.

Sometimes a property is incorrectly placed in the SFHA by the lender or its map determination company. The property owner may come to the community asking for help or advice. The local official is welcome to double check the determination, but the inquirer should be informed that the determination is the lender’s responsibility and the local government has no authority over it.

If it appears that the property is outside the SFHA, but the map determination says that it is inside, the owner can ask FEMA for a determination review within 45 days of the notice. A Flood Hazard Determination Review is requested jointly by the owner and the lender. Procedures for requesting the review can be found at [http://www.fema.gov/fhm/fq\\_gen11.shtm](http://www.fema.gov/fhm/fq_gen11.shtm).

If the submittal is complete and on time, FEMA will issue a Letter of Determination Review (LODR). This review does not result in an amendment or revision to the effective FIRM. It is only a finding about the location of a building or manufactured home relative to a designated SFHA.

A LODR only affects the Federal requirement for purchase of flood insurance. However, the mortgage lender always has the option to require flood insurance as a condition of providing financing, regardless of the location of the structure. If the map needs to be changed, the property owner can submit a request for a Letter of Map Amendment (LOMA).

### **Figure 320-3. Flood hazard determination review.**

3. Coastal A Zones are those parts of a community’s coastal floodplain, inland from the mapped V Zone (or shoreline if there is no mapped V Zone), that are subject to the damaging effects, of waves, velocity flows, erosion, scour, or combinations of these forces. The community must provide map information on coastal A Zones if they have been mapped. This may be when FEMA provides an advisory flood elevation map or FIRM that shows areas subject to waves over 1.5 feet or if the community is receiving credit for regulating coastal A Zones under Section 431.p (CAZ). For more information on mapping coastal A Zones, see Section 431.p.

Unless the community has coastal A Zone regulations, such as those credited under Section 431.p, the information is provided solely to inform inquirers of the additional flood hazard in the area. If the inquirers are considering building or remodeling, the information should encourage them to incorporate appropriate flood protection design measures. More information on design measures can be found in the *Coastal Construction Manual* (FEMA 55) and *Recommended Residential Construction for the Gulf Coast: Building on Strong and Safe Foundations* (FEMA 550) and related references that can be found on the Information Resource Library on FEMA’s website .

“Undeveloped coastal barriers” and “otherwise protected areas” of the Coastal Barrier Resources System are designated as such by Congress. The intent is to prohibit most expenditures of federal funds within these coastal barriers. The CBRA provisions are summarized in Figure 320-4.

If the local official cannot determine whether a property is within a designated coastal barrier or otherwise protected area, he or she can inform the inquirer to check with the U.S. Fish and Wildlife Service, either at a local office or by checking the website at [http://www.fws.gov/habitatconservation/coastal\\_barrier.htm](http://www.fws.gov/habitatconservation/coastal_barrier.htm).

If the person providing the map information service finds that a property is in a designated coastal barrier, he or she must inform the inquirer about the designation, the fact that a flood insurance policy cannot be sold for a building constructed after the date of designation, and the limits on federal assistance.

Communities with designated undeveloped coastal barriers should determine the date(s) on which the restrictions went into effect locally. More information on the rules for these areas can be found in the Flood Insurance Manual for insurance agents, by checking with the U.S. Fish and Wildlife Service or its website, [http://www.fws.gov/habitatconservation/coastal\\_barrier.htm](http://www.fws.gov/habitatconservation/coastal_barrier.htm).

4. The community, as well as a lender, must use the latest FIRM. The community is responsible for ensuring that the FIRM it uses is updated to reflect new subdivisions and changes in corporate limits. The community’s FIRM also needs to show all new FIRM data from flood insurance restudies, map revisions, and map amendments. This may mean plotting every Letter of Map Amendment (LOMA) and Letter of Map Revision (LOMR) or noting on the paper FIRM that LOMAs and LOMRs have been issued.

The community must also maintain copies of prior FIRMs that have been in effect since 1999 or the date the community applied for this credit, whichever is later. It is recommended that the community maintain a copy of every FIRM that has been published (credit for this is available under Activity 440 (Flood Data Maintenance)). Copies of prior FIRMs may be available from the National Service Provider’s Regional Management Centers (see Section 324.e).

Communities that use a digital map, GIS, or map overlays should consider applying for credit for Activity 440 (Flood Data Maintenance), which has the same prerequisite.

## The Coastal Barrier Resources System

The Coastal Barrier Resources Act of 1982 (CBRA), and the Coastal Barrier Improvement Act of 1990 removed the federal government from financial involvement associated with building and development in undeveloped portions of coastal areas (including the Great Lakes). These areas were mapped and designated as Coastal Barrier Resources System (CBRS) units and Otherwise Protected Areas. They are colloquially called “CBRA areas.” (pronounced “cobra” but not spelled that way).

Any federal program that may have the effect of encouraging development on coastal barrier islands is restricted by law. These programs include “any form of loan, grant, guarantee, insurance, payment, rebate, subsidy or any other form of direct or indirect Federal assistance” with specific and limited exceptions. For example, federal disaster assistance is limited to emergency relief in CBRA areas—there are no loans or grants to repair or rebuild buildings in those areas.

The legislation also banned the sale of National Flood Insurance Program (NFIP) flood insurance for structures built or substantially improved on or after a specified date. For the first CBRA designations, that date is October 1, 1983. For all subsequent designations, it is the date the CBRA area was identified. CBRA areas and their identification dates are shown in the legend of Flood Insurance Rate Maps (FIRMs).

If an owner of a building in a CBRA area wants to buy flood insurance, he or she would need a copy of the building permit showing that the building was properly built before the designation date and a signed statement from the floodplain ordinance administrator that it had not been substantially damaged or improved since then. The insurance agent may need to provide more documentation.

The boundaries of a CBRA area cannot be revised through the Letter of Map Amendment or Revision (LOMA/LOMR) process. They can only be revised through:

- Congressional action,
- Interpretation of boundaries by the U.S. Department of the Interior’s Fish and Wildlife Service, or
- Cartographic modifications by Department of Homeland Security’s FEMA to correct errors in the transcription of the Department of the Interior maps onto FIRMs.

If an NFIP policy is issued in error in a CBRA area, it will be cancelled and the premium refunded. No claim can be paid, even if the mistake is not found until a claim is made.

If a grandfathered building (i.e., a building built before the date of designation) is substantially improved or substantially damaged, its flood insurance policy will be cancelled.

Lenders are required to notify borrowers if the structure is in a CBRA area and that NFIP flood insurance and/or disaster assistance may not be available. Many lenders are reluctant to lend without protecting their investment with flood insurance and private flood insurance may not be available.

**Figure 320-4. Provisions of the Coastal Barrier Resources Act.**

5. The map information service must be publicized at least once a year. The publicity must say that elevation certificates are available for public review. For example, if the community started keeping elevation certificates after 1990, the publicity could state “Copies of FEMA elevation certificates on all buildings constructed in the floodplain since 1990 are available at the Building Department.”

Publicity for the service may be directed to the entire community or to three key audiences: lenders (banks, savings and loans, credit unions, etc.), insurance agents, and real estate agents. This can be done in one of three ways:

- a) Advise everyone about the map information service through one of three kinds of outreach projects:
  - An outreach project to the community credited under OPC in Activity 330 (Outreach Projects);
  - An outreach project pursuant to the public information strategy (OPS) credited in Activity 330, provided the public information strategy document discusses the best way to advise the target audiences; or
  - An outreach project that advises all residents and businesses in the community about the service, but is not credited under Activity 330 (e.g., a short notice with all tax or utility bills).
- b) An annual mailing (or e-mail) to all local lenders and insurance and real estate agencies. If the community cannot reach all three of these target audiences, it may receive partial credit for this activity.
- c) An annual article in the newsletters or magazines of appropriate organizations, such as the local Board of Realtors<sup>®</sup>, the local chapter of the American Bankers Association, or the state’s insurance department. If the Chamber of Commerce or similar organization has a newsletter that reaches all the appropriate offices in the community, a notice in the newsletter will suffice.

These publicity methods are described in more detail in Section 323, Credit Documentation. The first method would be the most efficient and economical one if the community can use an existing newsletter or other annual mailing that reaches everyone in the community. The third approach can help where there are many communities implementing this activity and where one bank or insurance agency deals with several communities (in metropolitan areas, for example). A master list of communities providing map information could be prepared and distributed each year by a state or regional agency.

6. The CRS credits mapping and regulating special flood-related hazards, such as subsidence and coastal erosion. These credits are described in Section 401, Special Hazard Areas, and in separate publications. If the community is receiving CRS credit for mapping and regulating one of these hazards, the map information service must include telling inquirers

if the property in question is also in the mapped special hazard area and any additional regulatory requirements the community may have for developing properties in that area.

7. The service must provide an opportunity for the inquirers to talk to community staff about map and floodplain management questions. One value of the map information service is that it provides an opportunity for the staff person responding to the inquiry to determine whether all of the inquirer's questions have been answered and to provide additional information on related topics, such as permit requirements and past flooding.

Therefore, the service must include an opportunity for personal contact. If the service is provided remotely, such as through a website, contractor, or by taking written or faxed requests, the annual publicity and the response to the inquirer must include a telephone number that can be called for further questions about map information and the community's floodplain management program.

A community may enter into an agreement with another agency, such as a regional planning commission, to provide map information. To receive CRS credit, there must be a written agreement that clarifies that the agency providing the service will respond to all inquirers and will allow the ISO/CRS Specialist to verify its work. The service must be publicized and a record of the inquiries must be maintained to facilitate verification of this credit (see Sections 323.b, c, and d).

### 321 Credit Points

Maximum credit for Activity 320: 140 points

Map Information Service:

MI = 140 points, if the community's service meets all seven of the prerequisites described under the Activity Description.

Credit is dependent upon both providing and publicizing the service. The community's method of providing map information and the accuracy of the information will be checked during the verification visit. The score for MI will be adjusted accordingly.

**Example 321-1.** Floodville responds to verbal and written inquiries. If the property cannot be located easily based on the street address, the lot and block numbers are requested. The form shown in Figure 320-2 is completed and signed by the building official. A copy of the form is kept in a separate file.

When the city designed the map information form, it met with local insurance agents and obtained an order form for flood insurance brochures and "stuffers." They are available free in quantity from the National Flood Insurance Program. Floodville also prepared a flyer based on the information in Figure 320-1. If a property is located in



an SFHA, the appropriate box is checked and a stuffer and the flyer are attached to the form.

The publicity for Floodville's service is explained in Example 323.a-1. Because the service is provided and publicized, MI = 140.

## 322 Credit Calculation

$$c320 = MI$$

**Example 322-1.** As explained above, MI for Floodville = 140.

During the verification visit, the ISO/CRS Specialist confirms that the maps are being read correctly in all five of the samples checked.

$$c320 = 140 \times 1.0 = 140.$$

## 323 Credit Documentation

The community must submit the following documentation:

- a. Documentation that shows how the community publicizes the service each year. The publicity must:
  - be distributed at least once a year;
  - explain how to access the service, i.e., what telephone number to call, or what internet address to use to access the website;
  - provide a telephone number for more information about flood maps and the community's floodplain management program (if different from the number to call for the map information service); and
  - describe what elevation certificates are available for public review.
1. If the community publicizes this service through an annual outreach project credited under Activity 330 (OPC or OPS), the publicity materials may be included with the documentation for Activity 330. "320" must be noted in the margin of the outreach project where the map information service is addressed. If an OPS is used, the public information strategy document must discuss the best way to publicize the map information service to the target audiences.

2. If the community publicizes this service through an annual outreach project that is not credited under Activity 330, a copy of the project. The materials must be distributed each year and must reach at least 90% of the properties in the community (vacant lots are not counted).
3. If the community sends a letter or e-mail directly to lending institutions and real estate and insurance agencies, a copy of the letter or e-mail message.
4. If the community notifies organizations of lending institutions and real estate and insurance agencies, copies of the notices in their publications. If any of the organizations has not yet published the notices, documentation must include written assurance from the organization that it intends to publish the notification within six months of the CRS application date.

**Example 323.a-1.** Floodville's State NFIP Coordinator has initiated a system of sending a master list of communities that provide map information to the state offices that regulate lenders and insurance agents. The list is also sent to the state Board of Realtors®. The Coordinator met with these offices and gave them sample articles that are used to publicize the local services. Copies of the articles actually published and sent to lenders, insurance agents and real estate agents are included with Floodville's application. The article for the insurance agents' publication includes a note that Floodville also has FEMA elevation certificates available for all buildings constructed in the floodplain since 1986.

**Example 323.a-2.** Watertown sends a brochure to all addresses in the community as an OPC outreach project in Activity 330. Included is the following notice:

#### **Floodplain Questions?**

If you want to know if a property is in the Special Flood Hazard Area, check our website at [www.Watertown.org/flood/mapinfo](http://www.Watertown.org/flood/mapinfo). You'll find a wealth of information on the City's Flood Insurance Rate Map, flood insurance, special rules for building in the floodplain, and ideas for protecting your property from flood damage. Or you can call the Building Department with all of your floodplain questions at 555/123-4567. The Building Department also has copies of FEMA elevation certificates for all buildings constructed in the floodplain since 1987.

- b. If another agency or organization provides map information, documentation that the agency agrees to provide the service to all inquirers and will allow the CRS to verify its work.

The community must have the following documentation available to verify implementation of this activity:

- c. Records of which institutions and agencies were notified of this service. If the community sends letters to institutions and agencies, a mailing list for those institutions and agencies.
- d. A record or log noting:
  - 1. the date of the inquiry,
  - 2. the address or location of the property in question,
  - 3. the FIRM zone,
  - 4. whether the inquirer was advised of the rules on mandatory flood insurance purchase,
  - 5. for properties in coastal floodplains, whether the inquirer was advised of
    - (a) the coastal A Zone hazard, and
    - (b) the CBRA areas and the financial assistance and flood insurance limitations in those areas (if appropriate); and
  - 6. Whether the inquirer was advised of additional special flood-related hazards and the precautions that should be taken when developing or improving the property (where appropriate).

Copies of letters will suffice for this documentation where the information is provided in writing. A sample of such a letter is shown in Figure 320-2. A log is required if information is given orally or on the telephone. A sample log is shown in Figure 320-5. Copies of the log or letters are also required if another agency or organization provides the map information.

- e. Documentation showing how the community keeps the FIRM updated at least annually to reflect new subdivisions, annexations, flood insurance restudies, map revisions, and map amendments (including LOMAs and LOMRs). The community must also have copies of all FIRMs that have been in effect since 1999 or the date the community applied for this credit, whichever is later.

LOG OF WALK-IN AND TELEPHONE MAP INFORMATION INQUIRIES							
DATE	TYPE	ADDRESS	PANEL	ZONE	ELEV	INSURANCE INFORMATION GIVEN	COASTAL A ZONE OR CBRS
2/3	W	201 W. Main	0001B	AE	734	H	No
2/4	T	309 W. Mumford	0001B	X	N/A	N/A	No
2/4	T	907 S. Busey	0002B	AE	727	V	No
2/5	L	408 E. Marion	0001B	A	N/A	H	No
2/5	W	3rd & State	0002B	AE	730	H	No

Codes:    W - walk in                    T - telephone request            L - written request  
               H - gave handout            V - told verbally                N/A - not applicable  
               CBRS - Coastal Barrier Resources System

**NOTE:** If all of the map information comes from the same FIRM, the community number is not logged. The community in this example has only one FIRM based upon NGVD, so the FIRM date and datum are not included in the log. Also, the panel number logged includes the suffix. The community has all of the data required for this activity in its log.

Communities that have no coastal A Zones or undeveloped coastal barriers designated on their FIRMs or special flood-related hazards do not need the last column of the log.

Communities receiving credit for one or more of the special flood-related hazards need to include a column on special hazards as a reminder to advise inquirers if the property is subject to that hazard.

**Figure 320-5. Sample log for a map information service.**

## 324 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. Copies of the following booklets are available free in quantity. See the FEMA Order Form at the end of Appendix E.

*Answers to Questions about the National Flood Insurance Program*, FEMA-387, Federal Emergency Management Agency, August 2001. (This is also available from FEMA's website at <http://www.fema.gov/nfip/qanda.shtm>.)

*How to Use a Flood Map to Determine Flood Risk For a Property*. FEMA-258, 1995.

*Mandatory Purchase of Flood Insurance Guidelines*, FEMA-186, Federal Emergency Management Agency, 1999. This booklet discusses the legal background of the flood insurance purchase requirement, particularly from the lender's perspective. (This is also available from FEMA's website at <http://www.fema.gov/nfip/mpurfi.shtm>.)

See also FEMA's flood hazard mapping website at [http://www.fema.gov/fhm/fq\\_gen.shtm](http://www.fema.gov/fhm/fq_gen.shtm).

Information on FEMA's review of a map determination can be found at [http://www.fema.gov/fhm/fq\\_gen11.shtm](http://www.fema.gov/fhm/fq_gen11.shtm).

- b. Flyers and stuffers about flood insurance are available through the National Flood Insurance Program. Contact a local insurance agent who sells flood insurance for examples and order forms; they are also available from:

FEMA Distribution Center  
P.O. Box 2010  
Jessup, MD 20794-2012  
1-800-480-2520  
Fax: (301) 362-5335

- c. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.
- d. Assistance in determining whether a "too-close-to-call" property is in the Coastal Barrier Resources System can be obtained from the U.S. Fish and Wildlife Service. More information on the CBRS can be found on the U.S. Fish and Wildlife Service's website at [http://www.fws.gov/habitatconservation/coastal\\_barrier.htm](http://www.fws.gov/habitatconservation/coastal_barrier.htm).
- e. Communities may check on past FIRMs and obtain background data by calling 1-877-FEMA MAP. They can also submit a written inquiry through this link: [http://www.fema.gov/fhm/tsd\\_emap.shtm](http://www.fema.gov/fhm/tsd_emap.shtm).
- f. The Compendium of Flood Map Changes is a list of all the changes made to the NFIP maps including Physical Map Revisions, Letters of Map Revision, and Letters of Map Amendment during a given 6-month period. The list is updated every 6 months and published in the *Federal Register*. See [http://www.fema.gov/fhm/dl\\_comp.shtm](http://www.fema.gov/fhm/dl_comp.shtm).

System Maintenance), and 610 (Flood Warning Program). Outreach projects should be designed with these publicity needs in mind. An example of this is shown in Figure 330-1.

### 331 Credit Points

Maximum credit for Activity 330: 380 points

Credit for the outreach projects is based on both the type of project and the topics covered. For credit, an outreach publication must fully cover a topic. There are 10 topics that can be covered to receive full credit under OPC, OPF, or OPA.

1. The local flood hazard.
2. Flood safety (required for full credit under Activity 610, Flood Warning Program).
3. Flood insurance (required for repetitive loss area outreach projects under Section 503).
4. Property protection measures (required for repetitive loss area outreach projects under Section 503).
5. The natural and beneficial functions of the local floodplain.
6. A map of the local flood hazard.
7. The flood warning system (required for full credit under Activity 610, Flood Warning Program).
8. Floodplain development permit requirements.
9. The substantial improvement/substantial damage requirements.
10. Drainage system maintenance (required for full credit for stream dumping regulations under Activity 540, Drainage System Maintenance).

Examples of a variety of outreach projects, including samples of several brochures produced by federal agencies and others, are included in the publication *CRS Credit for Outreach Projects*. This publication is available at no cost (see Appendix E).

Credit usually will not be given if an outreach project contains only a single sentence on a topic. As discussed below, the topic should be covered in enough detail to be useful to the reader. If the information provided in one year is inadequate for Community Rating System (CRS) credit, the community may augment it and apply for additional credit in a modification in a later year (see Section 215).

The 10 topics that can earn credit are

1. **The local flood hazard:** The project should include the source(s) of flooding (such as the names of the rivers or a statement that the greatest threat is storm surge from the ocean), information about past floods, and additional data on local flooding, such as velocities or the possibility of mudflows. At a minimum, this should include all flood hazards discussed in the community's Flood Insurance Rate Map (FIRM) and Flood Insurance Study and the approximate location of the boundary of the community's coastal A Zone, where known (e.g., "most properties seaward of Ocean Boulevard are in the coastal A Zone, where the flood hazard is greater due to waves and velocities"). If the community provides map or additional flood hazard information as credited under Activities 320 (Map Information Service) or 360 (Flood Protection Assistance), the service could be publicized under this topic.
2. **Flood safety:** Emergency precautions should be discussed, such as turning off the electricity and gas, not wading through moving floodwaters, or staying clear of unstable stream banks. Precautions against driving through flooded areas must be included. If the community is applying for credit for emergency warning dissemination under Activity 610 (Flood Warning Program), it must receive full credit for covering this topic. In coastal areas, the project should explain the need to evacuate when an evacuation order or advisory is issued.
3. **Flood insurance:** The project should note that standard property insurance does not cover flood damage but that flood insurance is available in the community. It should include some basic facts, such as why flood insurance is important, the 26% chance of experiencing a flood during the life of a 30-year mortgage, the types of insurance coverage, and the fact that there is a 30-day waiting period before coverage goes into effect. The project should note whether the community has any undeveloped coastal barriers where insurance may not be available. This topic must be covered in the outreach project that is implemented to meet the annual notice requirement for repetitive loss communities (see Section 503.e).
4. **Property protection measures:** Measures to protect a property from flood damage include retrofitting, grading a yard, correcting local drainage problems, and such emergency measures as moving furniture and sandbagging. Retrofitting measures are discussed in Activity 530 (Flood Protection). In areas subject to hurricanes and tropical storms, measures that protect against high winds should be mentioned, such as installing storm shutters and reinforced garage doors.

If the community provides property protection or retrofitting advice as credited under Activity 360 (Flood Protection Assistance), the service could be publicized under this topic. This topic must be covered in the outreach project that is implemented to meet the annual notice requirement for repetitive loss communities (see Section 503.e).

5. **Natural and beneficial functions:** The outreach project should discuss the natural and beneficial functions of local floodplains, any unique local features, the importance of protecting these functions, and how they can be protected. For CRS credit the discussion must address local conditions.

- 
6. **Map of the local flood hazard:** If the project includes a map of the community's flood hazard areas, it must meet the following criteria:
    - a. The map must clearly show every street affected, although all streets do not have to be named. Major streets must be named. If parcel lines or other linear features are shown, they must be readily distinguishable from streets.
    - b. The floodprone area must be clearly shown through shading or another method. In coastal communities, the coastal areas affected by storm surge from different categories of hurricanes can be shown on the map as an alternative to showing the floodplain. If the community is receiving CRS credit for mapping or managing the coastal A Zone or areas subject to special flood-related hazards, then such areas must be included on the map to receive full credit for this topic.
    - c. The map must be at a scale of at least 1 inch = 1 mile (about 1:62,500). A map to a smaller scale, such as 1 inch = 2 miles (1:125,000) may be appropriate for large rural areas with few streets.
  7. **The flood warning system:** Information on warning procedures, signals used, warning time, what radio and/or television station(s) to tune to, and similar data should be disseminated. These items must be covered if the community is applying for credit for emergency warning dissemination under Activity 610 (Flood Warning Program) (see Section 611.b.1(e)). No credit is awarded if the community does not have a flood warning system.
  8. **Floodplain development permit requirements:** The outreach project should explain that all developments in the floodplain (not just construction of buildings) need local permits. People should be advised to contact the community's regulatory department before they build, fill, or otherwise develop. They should also be told how to report illegal floodplain development.
  9. **The substantial improvement/damage requirements:** The National Flood Insurance Program (NFIP) requires that if the cost of reconstruction, rehabilitation, addition, or other improvements to a building equals or exceeds 50% of the building's market value, then the building must meet the same construction requirements as a new building. Substantially damaged buildings must be brought up to the same standards (e.g., a residence damaged so that the cost of repairs equals or exceeds 50% of the building's value before it was damaged must be elevated above the base flood elevation).

The outreach project should summarize the requirements (which are in the community's floodplain management regulations) and the local procedures for enforcing them. More information on the substantial improvement and substantial damage rules can be found in *Answers to Questions about Substantially Damaged Buildings*, FEMA-213 (see Section 334.e).
  10. **Drainage system maintenance:** The project should discuss regulations against dumping in channels, how to report violations, and why it is important to maintain the drainage system. These items must be covered if the community wants full credit for



its stream dumping regulations under Activity 540 (Drainage System Maintenance), (see Section 541.b.2 and the example shown in Figure 330-1).

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) has funded several research projects to find out what will motivate people to protect themselves from flooding. These projects have concluded that a properly run public information program can motivate property owners to protect themselves from flood damage.

One experiment showed that a direct mailing to floodplain residents was as effective as more expensive combinations of mailings, public meetings, and radio and television advertising. The research found that an effective public information program should be based on these principles:

1. An initial outreach document should not be long and detailed. The objective is to raise the property owner's interest by explaining the general idea of flood protection. More detailed information can be made available in a library or through technical assistance (see Activities 350 (Flood Protection Information) and 360 (Flood Protection Assistance)).
2. The message must be clear and unambiguous. It should be consistent throughout the material used. It should be written to be understood by the lay person.
3. The information should be geographically personalized so that readers see that it specifically addresses their situation. A brochure with a picture of a flooded local landmark will have a stronger impact than a state or federal publication. Individually addressed notices are more effective than general articles, maps, or letters addressed to "Occupant," because they clearly tell recipients that they are affected.
4. The recipient must view the information source as credible, authoritative, and relevant. A statement by the city engineer may be more appropriate than one by the governor.
5. The information should cover the risk of flooding without being too technical. Property owners must be convinced that they will be flooded someday.
6. The message must clearly articulate the most desirable measures. These measures must be appropriate for the hazard, affordable, and perceived as "realistic" by a property owner. They should fit in with the appearance of the area's housing.
7. The information should discuss the costs and benefits of various protection measures. It should include the up-to-date dollar costs of implementing each measure.
8. Because no retrofitting measure is foolproof, especially against higher, less frequent floods, flood insurance should always be recommended. In areas subject to basement flooding, the community should investigate the availability of private insurance coverage for sewer backup and sump pump failure.

7. Requiring signs posted in subdivisions to advise visitors of the flood hazard.
8. Requiring deeds to show the lot or building elevation in relation to sea level and the base or historical flood elevation.
9. Requiring a seller to disclose if the property is subject to a flood-related special hazard.

A community may apply for credit under one of these additional approaches, even if it does not have a real estate agent notification program. These approaches do not have to be local requirements. In many cases, these disclosure methods are required by state law.

This list is not meant to be all-inclusive. The objective of the ODR credit is to provide information to people before they are committed to owning or occupying a property with a flood hazard. Because these approaches do not affect as many people while they are actually looking for a property (as agent disclosure does), fewer credit points are provided. Furthermore, because they are difficult to verify in the field, these approaches must be based on a law or other explicit legal mandate.

**Example 341.b-1.** Floodville is seeking credit for two other disclosure requirements. One is based on a state law that requires that before they are recorded, all subdivision plats are to “include an engineer’s or surveyor’s statement as to which lots, if any, are partially or completely located in an area of special flood hazard identified pursuant to the National Flood Insurance Act of 1968.” [5 points]

Floodville’s zoning and building codes require that property records show all special requirements that have been imposed as a condition of building in a floodplain: “A record of each variance, special use permit, and conditional use permit, and all conditions and stipulations attached thereto, shall be provided to the County Recorder of Deeds to be filed with the record of the property.” [5 points]

The city’s application includes a photocopy of these two quoted legal requirements:  
ODR = 10.

Requirements for identifying the floodplain or flood elevations on preliminary plats or permit applications are not disclosure requirements and are not credited. ODR credit is based on a legal requirement to disclose the flood hazard on a record or notice that will be seen by potential purchasers or occupants of a property.

c. Real estate agents' brochure (REB) (Maximum credit: 10 points)

REB = 10, if real estate agents are providing brochures or handouts that advise potential buyers to investigate the flood hazard for a property. This credit is available even if the community does not receive credit for Disclosure of the Flood Hazard under Section 341.a.

An example of such a brochure is shown in Figure 340-1. A locally tailored brochure describing the community's flood hazard would be very useful. Sellers, in particular, may appreciate as complete a description as possible, especially if the flooding is shallow and slow-moving and retrofitting or other protective measures are appropriate and inexpensive. Purchasers of vacant land should be well aware of factors such as the depth, velocity, and warning time of the base flood.

**Example 341.c-1.** Floodville has given each real estate office several hundred copies of the brochure shown in Figure 340-1. The real estate agents give one to every client, including those looking at properties outside the floodplain: REB = 10.

d. Disclosure of other hazards (DOH) (Maximum credit: 10 points)

DOH = 10, if the notification to prospective buyers credited in Section 341.a includes disclosure of other flood-related hazards, such as the coastal A Zone, erosion, subsidence, or wetlands. This credit is available only if the community also receives credit for DFH.

Disclosure programs should not be limited to flood hazards. Potential property purchasers should be advised of other hazards that have been identified for specific sites. Coastal A Zones, erosion, subsidence, and wetlands are the site-specific hazards mentioned above. Others include dam failure, volcanoes, landslides, and wildfire, as well as tsunamis and the other special hazards listed in Section 401. Disclosing one hazard should trigger interest in others, so a broader-based program will be more effective.

The most common approach is to have a box in the MLS form. In this case, a photocopy of a completed MLS form must be submitted as documentation, along with a statement that all or most of the local agencies use the MLS form.

b. [Required only if the community is applying for ODR credit] A copy of ordinance or law language requiring one or more additional disclosure methods at the time of sale or rental of a property. The acronym "ODR" must be marked in the margin of the sections that pertain to this element.

This documentation need only be submitted if the community is requesting credit for one of the other disclosure requirements discussed in Section 341.b. A photocopy of the appropriate pages of the ordinance or statute is sufficient and should be attached to the activity worksheet. The Chief Executive Officer's (CEO's) application certification is considered to include a certification that the ordinance or statute has been enacted into law and is being enforced.

c. [Required only if the community is applying for REB credit] A brochure or other document that is made available to interested parties by real estate agents. The document must advise people looking to purchase property to investigate the flood hazard before they buy.

See Figure 340-1 for ideas on what should be included in a brochure.

d. [Required only if the community is applying for DOH credit] Documentation that the notification in Section 341.a includes disclosure of other flood-related hazards, such as the coastal A Zone, erosion, subsidence, or wetlands.

Maps that disclose information about other flood-related hazards to prospective purchasers are encouraged. In some states, coastal erosion or recession maps have been prepared. Coastal communities receiving credit under Activity 320 (Map Information) should disclose whether a property is in the coastal A Zone or is part of the Coastal Barrier Resources System. Some communities have mapped areas subject to land subsidence and are regulating new construction in those areas. Others have mapped and zoned wetlands or other sensitive areas. This activity gives credit for including these hazards on the same form or notice that is credited under DFH.

### **344 For More Information**

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. Copies of the following booklets are available free in quantity. See the FEMA Order Form at the end of Appendix E.

*Answers to Questions about the National Flood Insurance Program*, FEMA-387, Federal Emergency Management Agency, August 2001. This is also available from FEMA's website at <http://www.fema.gov/nfip/qanda.htm>.

*How to Use a Flood Map to Protect Your Property*, FEMA-258, Federal Emergency Management Agency, May 1995.

*Mandatory Purchase of Flood Insurance Guidelines*, FEMA-186, Federal Emergency Management Agency, September 1999. This booklet discusses the legal background of the flood insurance purchase requirement from the lender's perspective. It is also available from FEMA's website at <http://www.fema.gov/nfip/mpurfi.htm>.

## 400 MAPPING AND REGULATIONS

The Community Rating System (CRS) provides credit to communities that enact and enforce regulations that exceed the National Flood Insurance Program’s (NFIP’s) minimum standards so that more flood protection is provided for new development.

The activities in this series affect only certain portions of the community and, in some cases, only portions of the floodplain. Therefore, the credit points are adjusted to reflect the area affected. These activities are also adjusted to reflect the community’s growth rate. Section 710 explains this credit.

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If a site-specific or local study is conducted for an area shown on the FIRM as a numbered A or V Zone or AE or VE Zone, then the only way to receive Community Rating System (CRS) credit for a new study is if the base flood elevation is raised. If it is lowered, the map revision will mean a reduction in the size of the SFHA and lower flood elevations. The map revision will reduce flood insurance premiums more than a CRS classification. The CRS does not provide additional or duplicate credit.

There may be cases where a new profile is higher than the old base flood elevations in some areas and lower in other areas. In such cases, the reaches that qualify for credit must be identified on the impact adjustment map and scored accordingly. The reaches with new base flood elevations that are lower than the old elevations are not credited under NS.

If a new detailed study resulted in a floodplain larger than the previously mapped SFHA, then the community should mark the new floodplain as “AFD1” and “AFD2.” AFD1 would be coterminous with the FIRM’s SFHA. AFD2 would be the area outside the SFHA where base flood elevations are used to regulate development in B, C, D, or X Zones. The points for NS2 will be higher than for NS1.

b. Leverage (LEV) (Range: from 0 to 1.0)

1. If the community has data on the study costs:

$$\text{LEV} = \frac{\text{Non-FEMA share of the study cost}}{\text{Total cost of the study}}$$

2. If the community does not have financial data on the study costs, then

LEV = the total of the following:

- (a) 0.25, if a better topographic map was contributed to the study effort,
  - (b) 0.15, if other contributions were made to the study effort.
3. If the community adopts advisory flood elevations (AFEs) or flood recovery data provided by FEMA, the value of LEV is based on how quickly the AFEs or such data are adopted.
    - (a) Full credit is provided if the AFEs are adopted within 30 days. No credit is provided if they are adopted more than six months after they are published.

$$\text{LEV} = \frac{(180 - \text{DAYS})}{150}, \quad \text{The maximum value for LEV is 1.0}$$

where DAYS = the number of days between the date the AFEs are published by FEMA and the date they are adopted by the community. The value of DAYS ranges from 1 to 180 (six months).



- (b) If a community enacts a moratorium on new construction, and repairs of substantially damaged buildings from the time of the disaster to adoption of AFEs, then LEV = 1.0.
- (c) If a community adopts a regulatory elevation higher than the base flood elevations shown on its current FIRM, but lower than the published AFEs, the value for LEV will be pro-rated.
- (d) This credit for LEV stays in effect until the second cycle verification visit after publication of a revised FIRM with base flood elevations equal to or higher than the AFEs.

LEV is a ratio with a range of 0 to 1.0. If the study was financed entirely by non-FEMA resources, LEV = 1.0. Non-FEMA resources include the community, the state, a regional agency, the property owner, a developer, the Corps of Engineers, the Natural Resources Conservation Service, and any other agency or organization other than FEMA or a FEMA-funded program.

If the study was fully funded by FEMA, then LEV = 0. Communities do not receive NS or LEV credit for Flood Insurance Studies and FIRMs that are fully funded by FEMA.

If the community is a Cooperating Technical Partner, there should be readily available figures on how much the study cost and the amounts paid by FEMA, the community, and other involved agencies. If the Cooperating Technical Partner agreement is for the community to contribute 20% of the cost of a new study, then LEV = 0.2.

If the community, state, or other agency made an in-kind contribution, such as staff time or base maps, it can be converted to a dollar value on the Cooperating Technical Partner Mapping Activity Statement using FEMA “Blue Book” values. If the effort cannot be converted to dollars, then LEV = 0.25 or 0.15, according to the formula. If the dollar value results in a ratio lower than 0.25 or 0.15, then the higher figure can be used.

Flood Insurance Studies or restudies cost shared with a state agency, the U.S. Army Corps of Engineers, the Tennessee Valley Authority, the Natural Resources Conservation Service, or other federal agency are credited PROVIDED that the agency was not paid by FEMA for the work. Many studies are conducted by a state or federal agency under contract to FEMA or under the Limited Map Maintenance Program. In these instances, no LEV or NS credit is given.

Generally, if the additional flood data can be found in the original Flood Insurance Study, then FEMA paid the full cost, and LEV = 0. In some areas, the community, state, or regional district helped fund the study or paid for better topographic base mapping that was then included in the Flood Insurance Study. In these cases, the community must document its contribution. Often, the community’s contribution is mentioned in the Flood Insurance Study text and a copy of the appropriate page is sufficient.

**Example 411.c-1.** Floodville paid all of the costs for its study of the problem ditch in the C Zone, AFD1. LEV1 = 1.0. Developers pay for calculating base flood elevations in the A Zone along Deadman's Creek, AFD2. LEV2 = 1.0.

**Example 411.c-2.** Watertown's Engineering Department analyses are funded by the City. LEV1 = 1.0.

Watertown signed a Cooperating Technical Partner agreement with FEMA to restudy the Riley River. The agreement has the City funding \$50,000 toward the study and contributing its GIS contour map. These contributions are calculated to equal \$150,000. The total cost of the study is \$250,000.

$$\text{LEV2} = \frac{\$150,000}{\$250,000} = 0.6$$

Watertown's efforts equate to 60% of the cost of the Riley River restudy. In Section 413, the values for NS for this study are multiplied by 0.6, resulting in 60% of the credit for those elements. Note that Watertown will not receive this credit for the restudy until it is completed and adopted in the City's floodplain management regulations.

The third option for LEV credit can be used when FEMA provides advisory flood elevations after a major storm. In many areas, the storm surge from a hurricane exceeds the base flood elevations on the current effective FIRM. When this happens, it raises questions about the validity of the current FIRM's base flood elevations. FEMA conducts a reassessment of those elevations to see if they reflect the true risk. Flood Recovery Guidance is developed to provide communities with advisory flood elevations (AFEs) that they can use in the reconstruction process until more detailed data become available.

Normally a FEMA-funded flood study will not receive any credit under the CRS (i.e., LEV = 0). However, adopting higher flood elevations immediately after a storm can have a major positive impact on reconstruction and redevelopment in the floodplain. Therefore, a special exception is made to encourage communities to adopt their AFEs as quickly as possible.

Delaying adoption of AFEs decreases their value over time as more properties are reconstructed to the pre-storm base flood elevations. Accordingly, the formula for LEV reduces the credit if the community delays adoption. The value for LEV can range from 1.0 when the AFEs are adopted within one month of their publication by FEMA (DAYS = 30) to 0.4 if they are adopted four months later (DAYS = 120) to zero if they are adopted six or more months later (DAYS = 180).

It should be noted that if FEMA subsequently provides a new FIRM using the AFEs, adoption of the higher elevations is no longer optional. Adopting the elevations will be a minimum requirement of the NFIP and the community will lose this credit (i.e., LEV = 0) at the second cycle verification visit after publication of the new FIRM. This means a Class 6–9 community will keep the credit for a minimum of five years after the new FIRM makes adoption of the higher elevations mandatory.

It is hoped that before this happens, the community will have acquired, relocated, elevated, or otherwise protected many of its damaged buildings and will receive enough credit under Activities 520 (Acquisition and Relocation) or 530 (Flood Protection) to offset this possible loss of credit.

Should a subsequent FIRM have base flood elevations that are lower than the AFEs and the community opts to keep the AFEs in its regulations, then it will not lose this credit.

**Example 411.c-3.** Gulf Isle was hit by Hurricane Katrina in August 2005. FEMA published AFEs on November 15, 2005. The AFEs are higher than the BFEs in the current FIRM and extend the floodplain boundaries into the current FIRM's X Zones. The AFEs receive 150 points NS credit for higher BFEs and V-Zone boundaries in original AE and VE Zones and 240 points NS credit for providing BFEs in the FIRM's X Zones. With the impact adjustment, Gulf Isle would receive 270 points for NS if the new study had been fully funded by a non-FEMA source.

If the Gulf Isle City Council adopted the AFEs by December 14, 2005, DAYS = 30:

$$\text{LEV} = \frac{(180 - \text{DAYS})}{150} = \frac{(180 - 30)}{150} = \frac{150}{150} = 1.0$$

$$\text{LEV} = 1.0 \text{ and } c410 = 270 \times 1.0 = 270.$$

If the Council waited until February 20, 2006, DAYS = 97

$$\text{LEV} = \frac{(180 - \text{DAYS})}{150} = \frac{(180 - 97)}{150} = \frac{83}{150} = 0.65$$

$$\text{LEV} = 0.65 \text{ and } c410 = 270 \times 0.65 = 175.5.$$

If the City Council did not adopt the AFEs until after May 15, 2006, DAYS  $\geq$  180 and LEV = 0. There would be no CRS credit for adopting the AFEs.

- c. Higher study standard (HSS) (Maximum credit: 160 points)  
HSS credit is provided for the following higher study standards:

- Using future conditions hydrology,
- Using a higher confidence limit when calculating the 100-year discharge,
- Using better topographic data, and
- Showing 500-year flood elevations and the boundaries of the 500-year floodplain.

Additional higher study standards may be submitted by the community. FEMA will determine if they warrant credit for HSS.

The credit points are cumulative for each study, not to exceed the maximum listed.

Study scope	Original FIRM Zone			Max per Study
	B, C, D, or X	A or V	AE, VE, A#, V#	
1. Delineation of an approximate A Zone	20	10	–	40
2. Flood elevations for a site at time of development	40	30	–	80
3. New profile or length of shoreline	80	60	50	160

The points for HSS are cumulative. For example, a new profile (line 3) in an X Zone that used future conditions hydrology and better topographic data would receive  $80 + 80 = 160$  points for HSS. If the study also used a higher confidence limit when calculating the 100-year discharge, the total for HSS ( $80 + 80 + 80$ ) would exceed the maximum allowed per study and the score would be capped at 160. This is added to the NS score in Section 413, Credit Calculation.

A community may receive credit for HSS in areas where it does not receive credit for NS. For example, credit can be provided if the FIRM (or a later map adopted for regulatory purposes) was based on future conditions hydrology, provided the community's floodplain development regulations use base flood elevations based on future conditions.

Some background on the listed higher standards.

- Using future conditions hydrology: Future-conditions hydrology means that flood discharges associated with projected land use conditions are based on a community's zoning maps and/or comprehensive land use plans and without consideration of projected future construction of flood detention structures or projected future hydraulic modifications within a stream or other waterway, such as bridge and culvert construction, fill, and excavation. When the hydrologic study is based on future land use conditions, discharges will be higher than those from a study based on current development conditions.

If a long-range plan is used, its target date must still be at least five years away. For example a study done in 1985 based on land use in the year 2010 will not receive credit after 2005. However, if the hydrology was based on a fully developed watershed, there is no expiration of the credit.

- Using a higher confidence limit when calculating the 100-year discharge: Hydrology studies produce “estimates” of peak flows. The estimates used are the “best” estimates, which means that they are high 50% of the time and low 50% of the time. Using a higher confidence interval means that the estimates are too high more often and too low less often. For example, a 90% confidence limit means that the quantity of flow used to map a floodplain will be too high 90% of the time and too low 10% of the time. The result is a more dependable estimate of the 100-year flow.
- Using better topographic data: This credit is for using a base map that has topographic data better than what is available from the U.S. Geological Survey. Either:
  - The map has contour intervals smaller than what is available from the U.S. Geological Survey’s digital orthophoto quarter quads (DOQQs), or
  - In those areas where there are no DOQQs, the credit is provided if the contour interval is smaller than that on the area’s USGS quadrangle maps.

**Example 411.b-1.** Because Floodville expects that a large proportion of its drainage areas will be urbanized, its problem ditch study (AFD1) used a base flood discharge based on full watershed development (future conditions hydrology). AFD1 credit is based on line 3 and the original FIRM Zone was “C.” (HSS1 = 80 points).

The City’s floodplain management ordinance requires developers on Deadman’s Run (AFD2) to use future conditions hydrology. AFD2 credit is based on line 2 and the original FIRM Zone was “A.” (HSS2 = 40 points).

**Example 411.b-2.** Watertown’s site-specific analyses do not include any higher study standards. HSS1 = 0.

d. More restrictive floodway standard (FWS) (Maximum credit: 200 points)

FWS credit is based on the allowable floodway surcharge used to prepare the floodway map. The community or the state must document that a state or local law sets a maximum allowable surcharge.

1. FWS = 200, if the floodway delineation was based on no allowable rise in the flood elevation,

2. FWS = 150, if the allowable rise was from 0.01 to 0.2 feet,
3. FWS = 100, if the allowable rise was from 0.21 to 0.5 feet, or
4. FWS = 50, if the allowable rise was from 0.51 to 0.99 feet.

Figure 410-5 shows the standard approach to mapping a floodway. If the floodway was based on the FEMA surcharge standard of 1.0 foot, then there is no credit for this element. If a floodway map is based on some other standard (such as a limitation on velocity or a change in velocity) to determine more restrictive floodways, the community must determine the actual reduction in floodway surcharge that results. Since floodway analysis is almost always performed by the step-backwater method, the data provided for each cross section should be used to determine the actual average floodway surcharge.

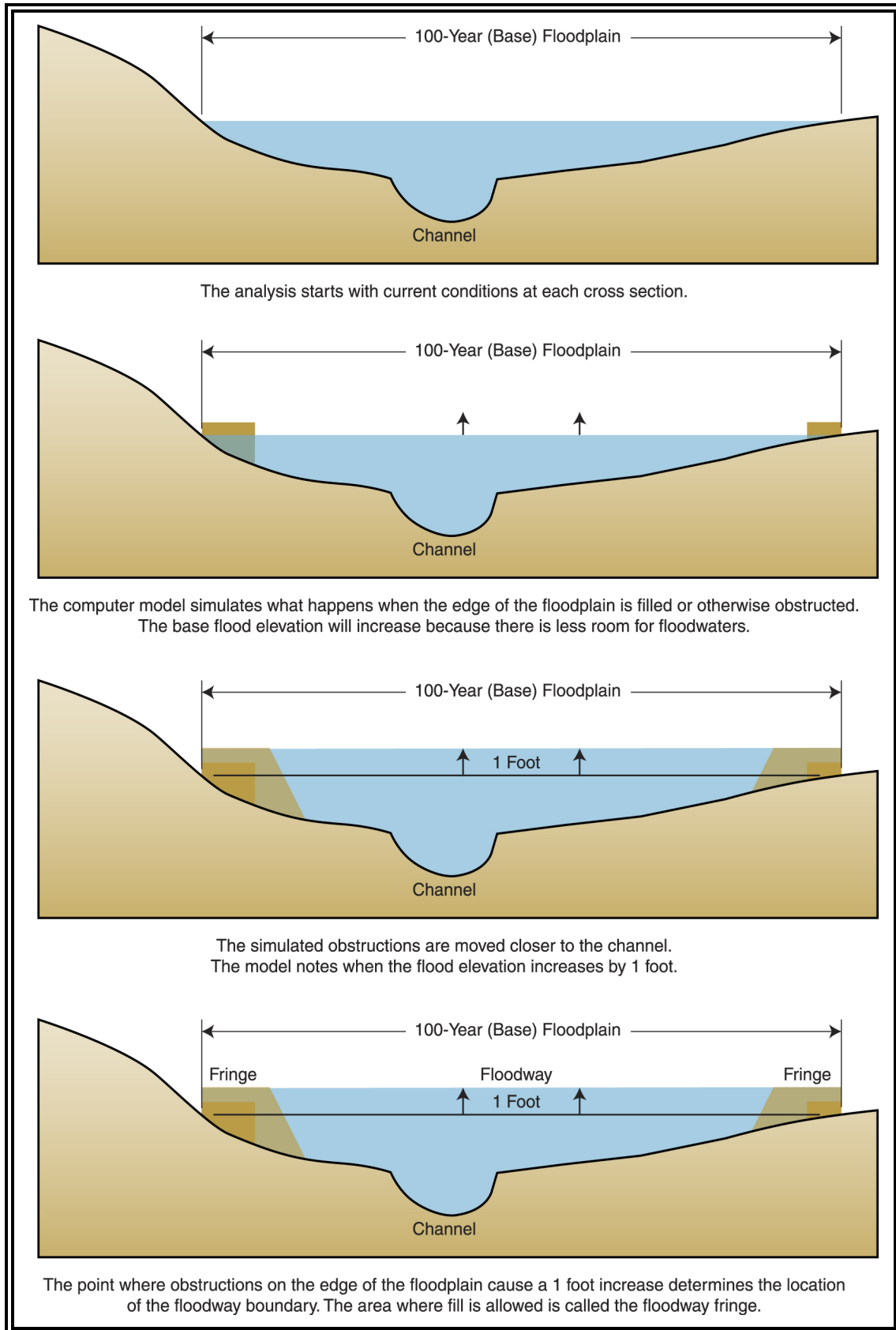
Many times a floodway study prepared according to the minimum NFIP guidelines produces a floodway surcharge of less than 1 foot at some cross sections. The fact that the average floodway surcharge is less than 1 foot does not qualify the community for FWS credit. The floodway surcharge must be reduced by a mapping standard that can be documented by the community.

**Example 411.c-1.** Floodville's state law requires that all floodway delineations be based on a 0.5-foot allowable floodway surcharge. In areas with floodways delineated according to this standard, FWS = 100.

This standard was used in the study for the problem ditch (AFD1): FWS1 = 100. There is no floodway study required for the site-specific analyses on Deadman's Run (AFD2): FWS2 = 0.

On Foster Creek the City uses the floodway provided with the Flood Insurance Study. That floodway was based on the state's 0.5-foot surcharge standard. Because state law required that it be prepared to a higher standard than that specified in *Guidelines and Specifications for Flood Hazard Mapping Partners*, the Foster Creek floodway can be credited. The area affected is the A15 Zone, which is designated as AFD3. Therefore, FWS3 = 100.

**NOTE:** Credit for FWS should not be confused with the minimum NFIP requirement that new development in the floodway may not result in any increase in flood heights. The FWS credit is for using a more restrictive standard to delineate the floodway.



**Figure 410-5. Standard approach to floodway delineation.**

**Example 411.c-2.** (See Figure 410-4.) When Watertown's Engineering Department conducts site-specific analyses to calculate base flood elevations for permit applicants in certain areas outside the SFHA (AFD1), it also conducts an encroachment study to see if the applicant's project will increase flood heights. A 0.1-foot surcharge is required by state law. This standard is used for these studies: FWS1 = 150.

Watertown designates the floodplain on the Riley River as AFD2. Watertown's Flood Insurance Study on the Riley River used the state standard: FWS2 = 150.

e. Additional flood data for special hazards (AFDSH): (Maximum credit: 50 points)

Credit for mapping areas of special flood-related hazards is described in separate CRS publications on special hazards.

If a community is applying for credit for mapping and regulating any of the special flood-related hazards, described in Section 401, it should turn now to the appropriate publications that are listed in Section 415.b. The credit points for mapping these areas are calculated separately. The resulting credit points, AFDSH, are then transferred to this activity.

f. Cooperating Technical Partner (CTP) (Maximum credit: 141 points)

(1) CTP1 = the total of the following

- 10, if the community is a Cooperating Technical Partner. The community must have signed a Cooperating Technical Partner agreement with FEMA that identifies shared mapping responsibilities and costs.
- 10, if the community is in a regional agency OR state that has signed a Cooperating Technical Partner agreement with FEMA. The agreement must identify the community or one of its flood problem areas as being studied. This credit is provided only for Cooperating Technical Partner agreements that relate to new studies or study standards. No credit is provided for agreements that only provide information on existing studies and data.

Cooperating Technical Partners are communities, regional agencies, or states that have the interest and capability to be active partners in FEMA's flood mapping program. Regional agencies that would qualify are those that are active in floodplain mapping, such as regional drainage or sanitary districts. They may also include county agencies active in preparing maps for both unincorporated and municipal floodplains. However, there is no credit for the community if the agreement does not affect a floodplain map in that community.



Cooperating Technical Partners enter into an agreement that formalizes their contribution and commitment to flood mapping. The objective of the program is to maximize limited funding by combining resources and to help maintain consistent national standards.

Each Cooperating Technical Partner enters into an agreement with FEMA, specifying what mapping activities it will implement. These could be as varied as:

- Refinement of approximate Zone A boundaries,
- Hydrologic and hydraulic modeling and floodplain mapping,
- DFIRM preparation and maintenance,
- Redelineation of detailed flood hazard information using updated topographic data,
- Digital base map data sharing,
- Hydrologic and hydraulic review of requests for map revision, or
- Adoption of specific technical standards or processes appropriate for local conditions.

(2) CTP2 =

- 1.1, if the study or standard was prepared pursuant to the Cooperating Technical Partner program. This provides a 1.1 multiplier that increases the additional flood data credit by 10%.
- 1.0, if the study or standard was not prepared pursuant to the Cooperating Technical Partner program or if it was prepared before the community, regional agency, or state signed the Cooperating Technical Partner agreement. The multiplier of 1.0 means that the credit points are not changed.

CTP1 provides credit for participating in the Cooperating Technical Partners program. When the program produces new studies or revises mapping standards, the community should receive credit under the other elements of Activity 410.

CTP2 increases the credit received under Activity 410 by 10% to recognize the extra benefits of the Cooperating Technical Partner program. CTP2 is a multiplier of the total score for each study or standard (AFD). If the study or standard was not done pursuant to a Cooperating Technical Partner agreement, then the score is multiplied by 1.0 and does not change.

**Example 411.f-1.** Watertown signed a Cooperating Technical Partner agreement with FEMA to restudy the Riley River. The state NFIP coordinating agency also signed a Cooperating Technical Partner agreement to review flood studies and provide other mapping support services.

$$\text{CTP1} = 10 + 10 = 20$$

Watertown can receive CTP1 credit now. After the restudy for the Riley River is completed and adopted in the City's floodplain management regulations, CTP2 will = 1.1. Watertown's score for the restudy will then receive a 10% credit bonus.

## 412 Impact Adjustment

### a. Option 1:

rAFD: If the standards in the area of AFD apply throughout the SFHA as shown on the community's FIRM, rAFD = 1.0.

Under Option 1, only one set of standards may be credited for AFD.

This option for rAFD can be used only if ALL of the area in the community's SFHA is under the standards of AFD. This would be the case, for example, if all of a community's SFHA is a numbered A Zone with a higher floodway standard. However, if part of the community's SFHA is unnumbered A Zone or coastal, this option cannot be used. If the community regulates areas outside its SFHA, it may get more credit by using Option 3.

**Example 412.a-1.** Singletown is affected by only one source of flooding: Single Creek. The Flood Insurance Study for Single Creek used the state's standard of a 0.1-foot floodway surcharge. Because the Single Creek floodplain covers the entire SFHA, Singletown uses Option 1: rAFD = 1.0.

### b. Option 2:

rAFD: If a single set of standards for AFD does not apply throughout the SFHA, the community may use an impact adjustment of rAFD = 0.25. If there is more than one set of standards for AFD, the community should choose the area with the highest value for AFD when using Option 2.

A community may opt to use the default value of 0.25 for rAFD if it does not want to take the time to prepare an Impact Adjustment Map or if it estimates that it would receive more points by using the minimum value of Option 2.

## c. Option 3:

rAFDi: The size of the area to which the standards of AFDi apply (aAFDi) must be determined in order to adjust the credit points to reflect its impact. This impact is the ratio of aAFD to the area of SFHA (aSFHA).

$$rAFDi = \frac{aAFDi}{aSFHA}$$

The maximum value for  $\sum rAFDi = 1.5$ .

All areas must be mutually exclusive.

Because all of a floodplain benefits from a more restrictive floodway surcharge, aFWS includes the entire width of that reach of the floodplain, not just the area of the floodway.

The Impact Adjustment Map is explained in Section 403. If there is more than one area, each done to a different standard, each area is marked separately, i.e., AFD1, AFD2, etc. If several areas were mapped or studied to identical standards, they are marked with the same acronym and number (see Figures 410-3 and 410-4).

The area of the SFHA (aSFHA) is the same for all instances of AFD. It is calculated based on the SFHA of the FIRM being revised by the newly adopted data. However, if a map revision reduces the size of the SFHA, the area calculations may be based on the new area (which will be to the community's benefit, because it increases the value of rAFD).

$\sum rAFDi$  stands for the sum of all of the impact adjustment ratios for AFD (i.e.,  $rAFD1 + rAFD2 + rAFD3 + \dots$ ). The sum of all rAFDi cannot be greater than 1.5. In this activity, an impact adjustment ratio greater than 1.0 reflects the fact that the community is regulating floodplain development in areas not identified on the FIRM. It is presumed that this will provide significant savings in future flood damage and NFIP claims, so the impact adjustment ratio for this activity may go up to 1.5.

**NOTE:** All areas marked AFDi must be mutually exclusive. If the community does not regulate outside of the SFHA, then  $\sum rAFDi$  cannot be greater than 1.0.

**Example 412.c-1.** In Floodville, the floodplain for the unnamed ditch is marked as AFD1 on the city's Impact Adjustment Map shown in Figure 410-3. The Deadman's Run A Zone is marked AFD2, and the Foster Creek floodplain is marked AFD3. Floodville's CRS Coordinator uses the grid square overlay method to determine the areas affected. He estimates these areas in acres:

$$aAFD1 = 71 \quad aAFD2 = 58 \quad aAFD3 = 267$$

$$aSFHA = 58 + 267 = 325$$

$$rAFD1 = \frac{aAFD1}{aSFHA} = \frac{71}{325} = 0.22$$

$$rAFD2 = \frac{aAFD2}{aSFHA} = \frac{58}{325} = 0.18$$

$$rAFD3 = \frac{aAFD3}{aSFHA} = \frac{267}{325} = 0.82$$

$$\Sigma rAFDi = 0.22 + 0.18 + 0.82 = 1.22, \text{ so } \Sigma rAFDi \leq 1.5.$$

Note that on Figure 410-3, AFD1 overlaps with AFD3. Because all areas must be mutually exclusive, Floodville can only count the overlapped area once. It should count the overlapped area under the AFD with the higher flood elevation, the elevation that takes precedence in the floodplain management regulations. Therefore, the overlapped area is counted under AFD3.

**Example 412.c-2.** (See Figure 410-4.) Watertown's Impact Adjustment Map shows the areas outside the SFHA where site-specific analyses are required as AFD1. The Riley River floodplain is designated as AFD2.

Watertown's engineer used a planimeter to measure the area of the SFHA (which is also the area of AFD2).

$aSFHA = 0.55$  square miles. When the area covered by the federal prison is removed from consideration,  $aSFHA = 0.43$  square miles.  $aAFD2 = aSFHA = 0.43$ .

The city's regulations requiring site-specific analyses (AFD1) cover 12,000 feet of stream channel. The area of AFD1 is the length times the width. Since the area regulated is 100 feet on each side of the channel, the width is  $100 \times 2 = 200$ .

$aAFD1 = 12,000 \times 200 = 2,400,000$  square feet or 0.09 square miles (see Section 404 for the conversion of square feet to square miles).

$$\text{Using Option 3, } rAFD1 = \frac{aAFD1}{aSFHA} = \frac{0.09}{0.43} = 0.21$$

$$rAFD2 = \frac{aAFD2}{aSFHA} = \frac{0.43}{0.43} = 1.0$$

$$\Sigma rAFDi = 0.21 + 1.0 = 1.21, \text{ so } \Sigma rAFDi \leq 1.5.$$

## 413 Credit Calculation

$$a. AFD_i = ((NS_i \times LEV_i) + HSS_i + FWS_i) \times rAFD_i \times CTP2_i$$

$$b. c410 = \sum AFD_i + (AFDSH_i \times CTP2_i) + CTP1$$

**Example 413.b-1.** In Floodville (see Figure 410-3):

1. AFD1 = detailed study of the problem ditch in the C Zone.

$$NS1 = 290 \quad HSS1 = 80 \quad LEV1 = 1.0 \quad FWS1 = 100 \quad rAFD1 = 0.22$$

Floodville does not receive any CTP credit, CTP1 = 0, CTP2 = 1.0.

$$AFD1 = ((290 \times 1.0) + 80 + 100) \times 0.22 \times 1.0 = 470 \times 0.22 \times 1.0 = 103.4$$

2. AFD2 = the site-specific analyses required for Deadman's Run.

$$NS2 = 75 \quad HSS2 = 40 \quad LEV2 = 1.0 \quad FWS2 = 0 \quad rAFD2 = 0.18 \quad CTP2 = 1.0$$

$$AFD2 = ((75 \times 1.0) + 40 + 0) \times 0.18 \times 1.0 = 115 \times 0.18 \times 1.0 = 20.7$$

3. AFD3 = the more restrictive floodway prepared for Foster Creek. This higher floodway standard was included in the City's original Flood Insurance Study, so there is no NS, HSS, or LEV credit.

$$NS3 = 0 \quad HSS3 = 0 \quad LEV3 = 0 \quad FWS3 = 100 \quad rAFD3 = 0.82 \quad CTP2 = 1.0$$

$$AFD3 = ((0 \times 0) + 0 + 100) \times 0.82 \times 1.0 = 100 \times 0.82 \times 1.0 = 82.0$$

4. Floodville does not receive any CTP credit, CTP1 = 0,

$$c410 = AFD1 + AFD2 + AFD3 + CTP1 = 103.4 + 20.7 + 82.0 + 0 = 206.1$$

**Example 413.b-2.** Watertown has two areas with additional flood data as shown on its Impact Adjustment Map in Figure 410-4.

1. AFD1 = the site-specific analyses conducted by the city's Engineering Department on all streams with a drainage area larger than 40 acres.

$$NS1 = 100 \quad HSS1 = 0 \quad LEV1 = 1.0 \quad FWS1 = 150 \quad rAFD1 = 0.21 \quad CTP2 = 1.0$$

$$AFD1 = ((100 \times 1.0) + 0 + 150) \times 0.21 \times 1.0 = 250 \times 0.21 \times 1.0 = 52.5$$

2. AFD2 = the Riley River floodplain covered by the original Flood Insurance Study. The City receives no NS, HSS, LEV or CTP2 credit at this time. However, it will when the restudy is completed and adopted in the City's floodplain management regulations. Watertown receives credit for the state's higher floodway standard (FWS).

$$NS2 = 0 \quad HSS2 = 0 \quad LEV2 = 1.0 \quad FWS2 = 150 \quad rAFD2 = 1.0 \quad CTP2 = 1.0$$

$$AFD2 = ((0 \times 0) + 0 + 150) \times 1.0 \times 1.0 = 150 \times 1.0 \times 1.0 = 150$$

3. Because the City and the state have signed Cooperating Technical Partner agreements,  $CTP1 = 10 + 10 = 20$ , even though the Riley River restudy has not been completed.

$$c410 = \sum AFD_i = AFD1 + AFD2 + CTP1 = 52.5 + 150 + 20 = 222.5$$

## 414 Credit Documentation

The community must submit the following:

- a. The ordinance or law language that adopts the flood study for regulatory purposes or that requires site-specific flood elevation or floodway studies to be conducted at the time of permit application.

The ordinance or law should either specify what standard is to be used or adopt the studies or maps for regulatory purposes.

**Example 414.a-1.** Appropriate regulatory language could read:

The floodplain delineation map for Skunk Creek, dated January 15, 1998, is adopted and included in the area of jurisdiction of this ordinance. OR

The flood protection elevation shall be the base flood elevation shown on the flood profiles in the Flood Insurance Study for the County. In floodplains where the Flood Insurance Study does not provide a profile, the applicant shall calculate the base flood elevation and submit it to the County Engineer for approval and use as the flood protection elevation. OR

The areas of mudflow hazard subject to the management requirements of this ordinance shall be as shown on the Geologic Hazard Maps produced by the State Geological Survey.

*NOTE: This **Coordinator's Manual** contains examples of certifications and ordinance language. Communities are advised to have all certifications and proposed ordinances reviewed by their attorneys or corporation counsels.*

b. Either:

- (1) A copy of the study or an explanation of the technique used and a licensed professional engineer's statement that the study was based on a technique approved by FEMA; OR

(2) A copy of the Flood Insurance Study pages or Letter of Map Revision (LOMR) that show that the study has been accepted by FEMA to revise the FIRM.

Only those pages of the study that explain the elements for which the community is applying need to be submitted. For example, if the community is applying for credit for a higher floodway standard, the page from the Flood Insurance Study explaining the standard used and an excerpt from the Floodway Data Table would suffice.

Under b.(1), the documentation must also include a statement signed by a licensed professional engineer that the technique used in the study or the ordinance language has been accepted by FEMA. It is not necessary to have the FEMA Regional Office specifically approve the study, if the technique is listed as an acceptable one in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

**Example 414.b-1.** Engineer's language for a study could read:

The attached study for Unnamed Ditch #1 was prepared using hydrological and hydraulic engineering methods that have been approved by FEMA. The hydrology was prepared using HEC-1 and the flood profiles were prepared using HEC-2, techniques that are listed in FEMA's *Numerical Models Meeting the Minimum Requirement of the NFIP*. The study was submitted on November 12, 2004, with a request for a Letter of Map Revision. The LOMR was issued on January 14, 2005.

**Example 414.b-2.** Engineer's language for an ordinance requirement could read:

Section 123.4 of Ordinance No. 89-23 requires all applicants for a development permit in unnumbered A Zones to calculate a base flood elevation and delineate a floodway for their development sites. The ordinance states that the applicant may use any method listed as acceptable in the current edition of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*.

c. [If the community requested credit for the independent review under Section 411.a] Documentation that the state or other agency reviewed and accepted the study or analysis techniques for which credit is being requested.

Documentation will usually be a letter from the responsible agency, stating that the review was done and/or that the data were approved.

The community must have the following documentation available to verify implementation of this activity:

- d. [Required only if the community is applying for credit under Section 411.b] For Flood Insurance Studies that were partly paid by FEMA, documentation that describes the non-FEMA share and who paid for it.

This documentation may be included in the engineer's statement described in Section 414.b. Note that many flood insurance studies and restudies were conducted by federal agencies and private consulting firms under contract to FEMA. This activity credits only the share of a study that FEMA did not finance.

Many communities are eligible for this credit if they shared in the cost of preparing the original Flood Insurance Study or subsequent revisions. The non-FEMA contribution may be in the form of direct financial participation or in-kind services, such as hydrologic studies or topographic mapping. The community must be able to document the non-FEMA participation.

- e. [If the community determines the impact adjustment ratios using Option 3 (412.c)] The Impact Adjustment Map with the appropriate acronyms marking the areas affected by the additional flood data. Each area with the same standard(s) should be marked "AFD." If more than one standard was used, the areas should be marked "AFD1," "AFD2," etc. Different areas mapped to the same standards should all be marked with the same acronym.

The Impact Adjustment Map is discussed in Section 403. If the community has additional flood data that affect more than 25% of its floodplain, then it will receive more points if it uses Option 3 as discussed in Section 412.c.

- f. [If the community is requesting credit for CTP2, Cooperating Technical Partner, under Section 411.f] Documentation that shows the relation between the study or standard and the Cooperating Technical Partner agreement.

The community must have the following documentation available at its cycle verification visit:

- g. [If the community has received credit for a new study (NS) under Section 411.a] A statement by the community's engineer that its regulatory floodplain maps and related data reflect current conditions. This statement need only address the maps that are credited by this activity.



The community's engineer must sign a statement that addresses the following issues:

- (1) Whether the precipitation data used for the study's hydrology are still appropriate and have not been replaced by new data, such as a new publication of standard precipitation data.
- (2) Whether the basis for the hydrology still reasonably reflects the current watershed conditions.
- (3) Whether the method used for the study is still considered appropriate, given current techniques and technology.
- (4) Whether construction, filling, and other development in the floodplain have made the maps obsolete.
- (5) If any of the flood studies or floodplain maps credited under this activity are not current, what needs to be done to bring them up to date (e.g., restudy a stream where the watershed has undergone a lot of development, revise a study to reflect a revised official precipitation data publication, or conduct a new study where a bridge has been replaced).

If any of the community's flood studies or floodplain maps are not current, the engineer must identify what needs to be done to bring them up to date, e.g., restudy a stream where the watershed has undergone a lot of development, revise a study to reflect a revised official precipitation data publication, or conduct a new study where a bridge has been replaced.

## **415 For More Information**

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. More information on FEMA mapping criteria can be found on the FEMA website, <http://www.fema.gov/fhm/>.

More information on the Cooperating Technical Partner program can be obtained from the FEMA Regional Office (see Appendix A) and from the website at [http://www.fema.gov/fhm/ctp\\_main.shtm](http://www.fema.gov/fhm/ctp_main.shtm).

To contact the FEMA map specialist for each region of the country, see [http://www.fema.gov/fhm/fp\\_key.shtm](http://www.fema.gov/fhm/fp_key.shtm).

For technical data on past FEMA maps, see [http://www.fema.gov/fhm/st\\_order.shtm](http://www.fema.gov/fhm/st_order.shtm).

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FEMA's *Numerical Models Meeting the Minimum Requirement of the NFIP* can be found at [http://www.fema.gov/fhm/en\\_modl.shtm](http://www.fema.gov/fhm/en_modl.shtm).

- b. See Appendix E to order free copies of the following publications.

*Special Hazards Supplement to the CRS Coordinator's Manual*  
*CRS Credit for Management of Coastal Erosion Hazards*  
*CRS Credit for Management of Tsunami Hazards.*

- c. The following publications may be obtained from

FEMA Distribution Center  
P.O. Box 2010  
Jessup, MD 20794-2012  
800-480-2520  
Fax: (301) 362-5335

*Guidelines and Specifications for Flood Hazard Mapping Partners*, Federal Emergency Management Agency, 2003. (Also available from FEMA's website at [http://www.fema.gov/fhm/gf\\_main.shtm](http://www.fema.gov/fhm/gf_main.shtm).)

*Use of Flood Insurance Study (FIS) Data as Available Data*, FEMA Floodplain Management Bulletin 1-98, 1998. (Also available from FEMA's website at [http://www.fema.gov/fima/fis\\_data.shtm](http://www.fema.gov/fima/fis_data.shtm).)

*Estimating the Value of Partner Contributions to Flood Mapping Projects "Blue Book,"* Federal Emergency Management Agency, 2002

The following can provide guidance on technical standards for studies in areas where base flood elevations were not provided with the FIRM:

*Managing Floodplain Development in Approximate Zone A Areas*, FEMA-265, July 1995. (Also available from FEMA's website at [http://www.fema.gov/fhm/dl\\_zonea.shtm](http://www.fema.gov/fhm/dl_zonea.shtm).)

- d. Communities may check on past FIRMs and obtain background data by calling 1-877-FEMA MAP. They can also submit a written inquiry through this link: [http://www.fema.gov/fhm/tsd\\_emap.shtm](http://www.fema.gov/fhm/tsd_emap.shtm).

- e. The following publications may be obtained from

Hydrologic Engineering Center  
U.S. Army Corps of Engineers  
609 Second St.  
Davis, CA 95616

*Effects of Flood Plain Encroachments on Peak Flow*, U.S. Army Corps of Engineers, September 1980.

*HEC-2 Water Surface Profiles—Users Manual*, U.S. Army Corps of Engineers, January 1981.

- f. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.

k. Special hazards regulations (SH) (Credit points vary.)

Credit for regulating areas subject to special flood-related hazards is described in the separate publications on special hazards.

The CRS encourages communities to devote special attention to areas affected by the special flood-related hazards listed in Section 401. Communities affected by one or more of these hazards must obtain a copy of the appropriate publication (see Appendix E), which shows how to increase credit points for regulating development in areas affected by these special hazards.

**Example 431.k-1.** Floodville manages Foster Creek's 500-year floodplain for ice jam hazards. Using the publication *CRS Credit for Management of Ice Jam Hazards*, it determines its credit. As explained in the example in that publication, cSH = 16.92.

i. State-mandated regulatory standards (SMS) (Maximum credit: 45 points)

SMS = the sum of the following:

1. Floodplain management regulatory standards (maximum credit: 25 points):
  - 0.1 x the equivalent credit for each state-mandated regulation credited in the 400 series of CRS activities.
2. Insurance agent training (maximum credit: 20 points):
  - (a) 5, if the state mandates that property insurance agents must attend at least one hour of training per year on flood insurance as a condition of obtaining or maintaining their license.
  - (b) 10, if the mandate is for two hours of flood insurance training.
  - (c) 20, if the mandate is for three or more hours of flood insurance training.

This element recognizes the benefit received by the NFIP for a state-required measure that is implemented in both CRS and non-CRS communities in that state. State-mandated regulations also benefit from better staff training and state oversight than other regulatory provisions.

A community should contact the ISO/CRS Specialist to obtain its SMS credit. The credit may apply differently to different communities within a state, depending on the requirement. For example, only coastal communities receive SMS credit for a state requirement for a coastal setback line.

Each submittal for credit is individually reviewed and scored with a value of 1 to 25 points. There is no credit if the activity is not verified locally. Examples of possible submittals include, but are not limited to:

- State-mandated freeboard,
- State floodway mapping standards, and
- State coastal setback regulations.

**Example 431.I-1.** Floodville's state requires a floodway mapping standard of a 0.5-foot allowable surcharge and Floodville's floodways were calculated to this standard. The equivalent credit for this under Activity 420 (Additional Flood Data), Section 411.c, More Restrictive Floodway Standard (FWS), is 100 points.

$$\text{SMS} = 0.1 \times 100 = 10$$

m. Building code (BC) (Maximum credit: 190 points)

BC = the sum of the following. These credits are reduced if the community adopts only parts of each code or if the community adopts a stand-alone floodplain management ordinance instead of adopting the flood provisions (including ASCE 24) of the International Code Series (I-Codes).

1.  $15 \times (7 - \text{BCEGS})$  where BCEGS is the class attained by the community under the Building Code Effectiveness Grading Schedule. There is no credit for BCEGS classes 7, 8, 9, or 10.
2. Up to 100 points for adopting a complete set of the codes. This credit is the sum of the following points:
  - (a) 40, if the community has adopted the current or previous edition of the International Building Code, the National Fire Protection Association's Building Construction and Safety Code (NFPA 5000), or their equivalent;
  - (b) 40, if the community has adopted the current or previous edition of the International Residential Code, the National Fire Protection Association's Building Construction and Safety Code (NFPA 5000), or their equivalent;
  - (c) 20, if the community has adopted the current or previous edition of all of the following codes (or their equivalent):
    - (1) International Plumbing Code or Uniform Plumbing Code,
    - (2) International Mechanical Code or Uniform Mechanical Code,
    - (3) International Fuel Gas Code, and
    - (4) International Private Sewage Disposal Code.

Even though a CRS community has been deemed to be in full compliance with the NFIP, it may not have a building code. Many communities meet their NFIP obligations through a stand-alone ordinance that may be administered by the zoning, planning, engineering, or other office, separate from the building department. A floodplain management program can work without a code, but implementation may not be as effective.

Coordinating floodplain management with a local building code has several advantages, which are summarized in Figure 430-2. Because of these advantages, the CRS provides credit for building codes in two ways: crediting the community's Building Code Effectiveness Grading Schedule (BCEGS) classification and recognizing those communities that have adopted the current editions of the appropriate codes.

**BCEGS:** A community must adopt and enforce a building code to qualify for a CRS class 7 or better (see Sections 211.b and c). The BCEGS, developed and operated by the Insurance Services Offices, Inc. (ISO) assesses the building codes in effect in a community and how a community enforces them, with special emphasis on mitigation of losses from natural disasters.

The insurance industry began the BCEGS project after determining that the catastrophic losses from Hurricane Andrew were compounded by poor building code enforcement. The insurance goal is that the prospect of lessening catastrophe-related damage (and ultimately lower insurance costs) provides an incentive for communities to enforce their building codes more rigorously.

In its BCEGS program, ISO assigns each community a grade of 1 (best) to 10 (no recognized program). Ratings are based on community answers to an extensive mailed questionnaire and a follow-up community verification visit with the cognizant building department by ISO.

BCEGS ratings are provided for all communities that do code enforcement, whether it be for themselves or for smaller jurisdictions. When a smaller community's code enforcement program is administered by a larger jurisdiction, the smaller community will receive the larger jurisdiction's classification.

There are two ratings for each jurisdiction, personal (residential) and commercial. If they are different, the CRS prerequisite and this element's credit are based on the higher number of the two ratings. For example, if a community has a class 6 residential BCEGS rating and a class 5 commercial, the CRS considers it a class 6 BCEGS community.

Under this element, the credit for BC is determined by subtracting the BCEGS class from 7 and multiplying the result by 15. There is no credit for BCEGS classes 7, 8, 9, or 10. For example, if a community has a BCEGS class 4,  $BC = 15 \times (7 - 4) = 15 \times 3 = 45$ .

### **Interfaces between Building Codes and Floodplain Management**

**Permits.** The building code is a built-in measure to assure that permits are obtained for structures. The code can also extend to permits for “other development,” such as requiring permits for grading, paving, and excavation. In the absence of an “automatic” building permit requirement, it is often difficult for people to know they are in the floodplain, thereby triggering a floodplain permit. The code requirement process especially helps capture any rehabilitation, addition, or other improvement, especially in the case of older buildings, as it relates to substantial improvement requirements to elevate floodplain buildings.

**Inspections.** A separate floodplain management ordinance may specify a staff of floodplain inspectors. However, experience has shown this kind of staff, unless specially trained, would not necessarily be qualified to assess building practices. A building code usually requires certain mandatory kinds of inspections that dovetail with inspections for flood purposes (e.g., at the time of a foundation inspection, which is quite routine per a building code, elevation certifications can be required before further construction proceeds). The trained eyes of a building inspector are a definite advantage when looking for construction methods and materials to reduce flood losses, as is required in the NFIP.

**Permits for Other Development and Inspector Observations.** Although building codes do not necessarily regulate “other development,” such as grading, paving, or excavation that can result in increased flood losses, the presence of trained building inspectors in the field, who can observe all development, is effective in identifying such activities so that action can be taken if needed. Any local floodplain management program that does not have the benefit of regular building inspectors would have to establish a comparable field presence.

**Post-Flood Inspections.** After a flood, there is a strong desire to rebuild. Communities with a building code and inspectors are generally better able to enforce the permit requirement for damaged buildings in the floodplain.

**Floodplain Management Requirements.** A number of NFIP floodplain management requirements relate to how a building is constructed and what materials are to be used. These areas of construction are normally governed by building codes. Examples include constructing buildings with foundations that are anchored to resist flotation, collapse, or lateral movement; use of flood-resistant materials; placement of utilities and mechanical equipment; and special construction requirements in V Zones. Having a building code in place will help ensure that these requirements are properly implemented.

**Special Certifications.** Without the expertise of building inspectors, it is much more difficult for a community to review special construction-related certifications that are required in the NFIP. These include floodproofing certifications, certifications of lowest floor elevations (or lowest horizontal structural members in V Zones), certifications for openings that are designed differently from minimum NFIP criteria, design and methods of construction of pile and column foundation elements in V Zones, and breakaway walls in V Zones when the design strength exceeds minimum criteria.

**Construction Quality.** In the absence of a building code, there is no assurance that buildings placed in floodplains, even though elevated, will survive. Buildings that are improperly constructed in floodplains can be subject to significantly more damage than those built to code. Use of improper materials, unsafe foundations, and inadequate connections are examples of causes for possible failures. The increased damage will often be paid for either through insurance or disaster aid, thereby working contrary to good mitigation practices and to CRS principles.

**Existing Buildings.** Building departments routinely handle permits for existing buildings, yet planning and zoning departments, which are often responsible for administering community floodplain management ordinances, rarely deal with proposals to modify sites that are already developed. This has been known to lead to gaps in enforcement of the substantial improvement and substantial damage requirements of the NFIP.

**Figure 430-2. Interfaces between building codes and floodplain management.**

If a community is in a state that does not have a formal BCEGS program, a courtesy review may be conducted to obtain an equivalent BCEGS class for CRS purposes. More information on BCEGS can be obtained from ISO through the ISO/CRS Specialists listed in Appendix G.

**Example 431.I-1.** Floodville has kept its building code current. Its BCEGS class is 4 commercial and 5 residential. The 5 is used for CRS credit:

$$BC = 15 \times (7 - 5) = 15 \times 2 = 30$$

**I-Codes:** The International Code series (I-Codes) includes provisions that address all NFIP minimum floodplain management requirements. Those NFIP requirements related to the actual construction of buildings are contained in the bodies of the International Building Code and International Residential Code. Requirements related to building utilities are contained in these codes and in the International Plumbing Code, International Mechanical Code, International Fuel Gas Code, and International Private Sewage Disposal Code. The other NFIP requirements, such as administrative provisions and requirements that apply to floodways, subdivisions, and manufactured homes, are contained in Appendix G of the International Building Code. Communities that adopt the I-Codes have the option of either adopting Appendix G or addressing these other requirements through a companion ordinance or regulation.

In the past, the model national building codes have included, to a variable extent, provisions related to natural hazards, such as seismic hazards, high winds, severe winter storms, and flood hazards. The I-Codes address all of these hazards on a consistent, rational basis that allows mitigation of the effects of those natural hazards that are found within each jurisdiction's boundaries.

Because of the advantages of incorporating the I-Codes into the community's floodplain management program and addressing other hazards, the CRS provides up to 100 points for adoption of the complete series. To receive full credit, the entire code must be adopted by the community.

If the following sections are not adopted or are adopted with amendments, the language will be reviewed to determine the credit:

- International Building Code: Chapters 3–7, 14–18, and 21–24.
- International Residential Code: Chapters 3–6, 8, and 9.

In some states, communities are required to adopt state codes or state versions of the I-Codes. In those cases, the provisions of the mandated code will be compared to the I-Codes and scored appropriately.

For more information on the links between the I-Codes, the NFIP, and CRS credit, see *Reducing Flood Losses Through the International Code Series*.



**NFPA 5000:** The same provisions apply to the NFPA codes. If they are adopted with amendments, the language will be reviewed to determine the credit.

n. Staffing (STF) (maximum credit: 50 points):

1. STF = 50, if all staff involved in (a) reviewing plans, (b) issuing permits, and (c) conducting field inspections for floodplain development are Certified Floodplain Managers (CFMs); OR
2. STF = 25, if all proposed development projects in the floodplain and all final inspections and project approvals are reviewed and approved by a CFM; OR
3. STF = 5, for each CFM or graduate of an approved course on managing floodplain development employed in the office that regulates floodplain development (up to 25 points). If a CFM also graduated from the NFIP course, it is counted once as 5 points. This credit is also provided if the community's CRS Coordinator is a CFM or a member of the community's staff has graduated from the Emergency Management Institute's CRS course.

The Association of State Floodplain Managers (ASFPM) and several states have created floodplain manager certification programs with requirements similar to the EMI course graduation criteria. More points are provided if the staff person has been certified by ASFPM (or by a state certification program that has been accredited by ASFPM) because the staff must fulfill a continuing education requirement to maintain their certification.

Credit under Sections 431.n.1 and 431.n.2. is dependent on the CFMs' being directly involved in permit review. A CFM must review each project in the floodplain before it is permitted and must conduct an inspection or review inspection reports after the project is completed (e.g., before a certificate of occupancy is issued). The CFM may be a consultant or employee of a regional agency. The credit is provided as long as no new floodplain development project is used or occupied without the review and approval of a CFM.

If the head of the regulatory office is (1) responsible for all permits issued, (2) is a CFM, and (3) establishes procedures that ensure that all floodplain development projects are properly constructed, then the community would qualify for the 25 points under Section 431.n.2. Otherwise, if some members of the regulatory staff are CFMs, but some floodplain development projects are approved by non-CFMs, then 5 points are provided for each CFM on staff.

This credit will be removed if the staff person leaves the community or does not maintain his or her certification.

Five credit points are provided under this element if the staff responsible for floodplain permits have graduated from the "Managing Floodplain Development through the National Flood Insurance Program" course at the Emergency Management Institute (EMI), the four- or

five-day field-deployed version of this course, the home study version, or other equivalent training. If a CFM also graduated from the NFIP course, it is counted once as 5 points.

Other courses on local floodplain management topics can be submitted for approval. These could include the EMI courses “Residential Coastal Construction,” “Advanced Floodplain Management Concepts,” or the field-deployed versions, and state sponsored classes. Courses of less than four or five days receive pro-rated credit (e.g., an approved two-day course on floodplain management will typically receive two points). A list of courses approved for CRS credit is posted on the CRS Resource Center website listed under Activity 430.

The credit for training is based on the number of courses taken. If two people take the “Managing Floodplain Development” course, the community receives 10 points, the same credit provided if one person took both the “Managing Floodplain Development” and “Coastal Construction” courses. If a CFM took the Coastal Construction course, it is worth 10 points. More information on EMI courses can be found in Section 435.

The maximum credit under Section 431.n.3 is 25 points for any combination of CFMs or EMI course graduates. The only way to get more than 25 points for STF is if all regulatory staff are CFMs (Section 431.n.1).

If the community is seeking credit for having the person responsible for floodplain permits graduated from EMI’s floodplain management course, a copy of the certificate of graduation must be provided. It should be noted that an EMI certificate of ATTENDANCE is not sufficient. An EMI CERTIFICATE OF GRADUATION is provided only if the student passed the final examination.

**Example 431.n-1:** Someburg has one person handling all floodplain management activities. That person becomes and stays certified: 50 points.

**Example 431.n-2:** Gulf Beach County has five people involved in building and development permitting. Two are certified and one of the others has been to the EMI coastal construction course. Procedures require that one of the CFMs review all proposed projects in the SFHA and review the final inspection report before a certificate of occupancy is issued. The score would be 25 + 5 for the two CFMs and 5 for the EMI graduate. The community would receive 25 + 5 + 5 = 35 points.

o. Manufactured home parks (MHP) (Maximum credit: 50 points)

1. Prerequisites:

- (a) The community has one or more existing manufactured home parks or subdivisions in its regulatory floodplain.
- (b) Base flood elevations are greater than three feet deep in the parks or subdivisions.

2. MHP = 50, if regulations require that new and replacement manufactured homes placed in existing manufactured home parks or subdivisions be properly anchored and elevated to or above the base flood elevation plus any required freeboard.

An “existing manufactured home park or subdivision” is a park or subdivision that was established before the adoption of floodplain management regulations by the community. The NFIP regulations (44 *CFR* 60.3(c)(12)) allow communities to site manufactured homes in existing manufactured home parks or subdivisions on reinforced piers or other foundation elements that are not less than 36 inches above grade. In some cases this results in manufactured homes elevated above the base flood elevation, but where flooding is deeper than three feet, it exposes them to substantial damage.

This element credits regulations that do not differentiate between manufactured homes and conventional “stick built” buildings or between existing and new manufactured home parks and subdivisions. However, the prerequisites limit this credit to those communities that have existing manufactured home parks where the base flood is greater than three feet deep. In other words, the credit is limited to those communities where these regulations will have an impact. Because of this, there is no impact adjustment for this element.

This ordinance language was a requirement of the NFIP before 1989. When communities were given the option of the 3-foot standard, many kept the higher standard and did not revise their regulations. The creditable language is also included in the new International Building Code. Therefore, it is possible that a community’s current ordinance already has the language that is credited by this element.

p. Coastal AE Zones (CAZ) (Maximum credit: 650 points)

1. Prerequisites:
  - (a) The community must have a coastal floodplain on the Atlantic, Gulf of Mexico, Pacific, or Great Lakes coasts.
  - (b) This credit is not available in a V Zone because it credits regulatory standards that are minimum NFIP requirements for V Zones.
  - (c) The community must map or otherwise designate its coastal AE Zone. The coastal AE Zone is the coastal SFHA that is not mapped as V Zone. A community may declare all of its coastal SFHA inland from the V Zone as coastal AE Zone (as may be the case for a barrier island) or it may use some other standard, such as identifying all areas where breaking waves are higher than one foot.
2. The credit for this element is in addition to the community’s credit for enclosure limits (ENL) under Section 431.h.

CAZ = the total of the following points:

- (a) 500, if all new buildings in the coastal AE Zone must meet the requirements for buildings in V Zones and for openings in A Zones (44 *CFR* 60.3(e) and 60.3(c)(5)). If only some of the V-Zone regulations are enforced in the coastal AE Zone, the points are prorated as follows:
  - (1) 225, if all of the following V-Zone foundation standards (found in 44 *CFR* 60.3(e)) are required by the community:
    - (a) New construction and substantial improvements are elevated on piles and columns (§60.3(e)(4));
    - (b) The pile or column foundation and the structure attached thereto are anchored to resist floatation, collapse, and lateral movement due to the effects of wind and water loads (§60.3(e)(4)(ii));
    - (c) New construction and substantial improvements have the space below the lowest floor free of obstruction or enclosed with non-supporting breakaway walls, open wood lattice work, or insect screening (§60.3(e)(5)), and have openings (§60.3(c)(5)); and
    - (d) Use of fill for structural support is prohibited (§60.3(e)(6)).
  - (2) 100, if the bottom of the lowest horizontal structural member and the electrical and mechanical equipment servicing the building must be elevated to or above the base flood elevation (§60.3(e)(4)(i));
  - (3) 125, if a registered professional engineer or architect must develop or review the structural design, specifications, and plans and certify that the designs and methods of construction to be used meet accepted standards of practice for meeting the provisions of §60.3(e)(4)(ii) and breakaway walls (§60.3(e)(5)).
  - (4) 25, provided all new construction is located landward of the reach of mean high tide (§60.3(e)(3)). These points are available only if the designated area includes shoreline).
  - (5) 25, if the community prohibits human alteration of ANY sand dunes or mangroves that would increase flood damage (§60.3(e)(7)). These points are available only if the designated areas include sand dunes or mangroves.
- (b) EITHER
  - (1) 150, if regulations prohibit any building enclosures, including solid breakaway walls, below the base flood elevation; OR
  - (2) 50, if regulations prohibit enclosures of areas of 300 square feet or greater, including breakaway walls, below the base flood elevation. The area enclosed must still meet all NFIP requirements for openings, anchoring, and flood-resistant materials.

FEMA has concluded that its criteria for construction in A Zones do not provide adequate protection in coastal AE Zones subject to wave effects, velocity flows, erosion, scour, or combinations of these forces. Wave tank studies conducted by FEMA show that breaking waves lower than the 3-foot criterion used to designate VE Zones can cause considerable damage. Post-disaster evaluations and insurance claims data also support this conclusion, particularly for those buildings with enclosures below the elevated floor. FEMA's new *Coastal Construction Manual* strongly encourages use of some or all of the VE Zone construction methods in coastal AE Zones, depending on the hazard. A handout providing information about coastal A Zones is shown in Figure 430-3.

Credit under Section 430.p.2(a)(2) can be given where the top of the lowest floor is used as the reference point and the community regulations require two or more feet of freeboard in the coastal AE zone. However, a community cannot receive both freeboard (FRB) and CAZ credit for the same two feet of freeboard. To receive freeboard credit the community would need to prorate the credit for freeboard greater than two feet for the area in the regulated coastal AE Zone.

This element has an impact adjustment. Therefore, coastal communities can only receive the maximum 650 points if their entire regulatory floodplain (aRF) is treated as a VE Zone.

**Example 431.p-1.** Gulf Beach County's floodplain regulations state that all lands seaward of the Coastal Highway shall be considered V Zones for building protection purposes. It also states that no new buildings or substantial improvements seaward of the Coastal Highway shall have enclosures below the level of the base flood elevation plus two feet.

CAZ = 500 + 150 = 650.

Note that the credit for CAZ will be multiplied by the impact adjustment so the final credit (cCAZ) will reflect how much of the County's regulatory floodplain is affected by these regulations.

## 432 Impact Adjustment

The area affected by a regulatory standard must exclude areas designated as open space that are receiving OS credit under Activity 420 (Open Space Preservation). There is no impact adjustment for the following elements:

- Section 431.l State-mandated regulatory standards (SMS)
- Section 431.m Building code (BC)
- Section 431.n Staffing (STF)
- Section 431.o Manufactured home parks (MHP).



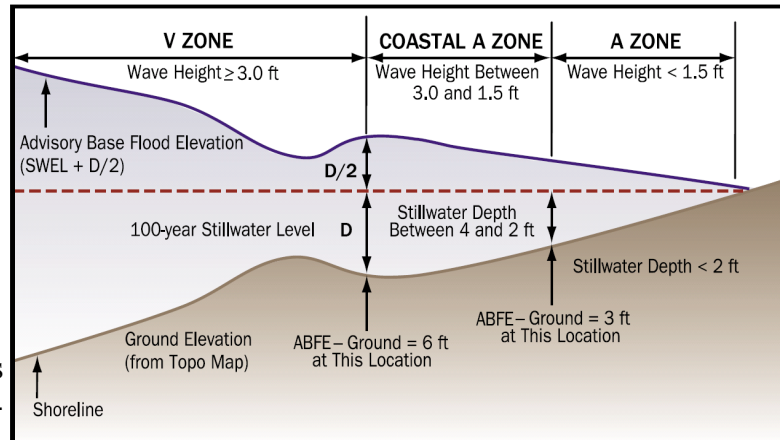
### Mapping Coastal A Zones

Recent post-storm investigations have shown that typical A-Zone construction techniques (e.g., wood-frame, light-gauge steel or masonry walls on shallow footings or slabs, etc.) are subject to damage when exposed to less than 3-foot breaking waves, which is the current threshold for V-Zone conditions. Accordingly, FEMA and the Community Rating System encourage communities to map the areas subject to damaging waves and velocities and enact special regulations for new construction in those areas.

For the purposes of the CRS, these areas are called coastal A Zones. Regulating the area is optional and credited under Activity 430 (Higher Regulatory Standards), Section 431.p.

Coastal A Zones have not been shown on Flood Insurance Rate Maps (FIRMs) or mentioned in a community's Flood Insurance Study Report.

Therefore, the exact boundary of a coastal A Zone is determined by the community. At a minimum, it should include all areas subject to waves of 1.5 feet in height or more.



In some cases, FEMA’s advisory flood recovery maps show the area subject to such waves. An example from the Mississippi Gulf Coast is shown to the right. Some new FIRMs will delineate the “limit of moderate wave action.” In other cases, the community may want to use a readily identifiable feature as its boundary. For example, because Hurricane Katrina flooded areas inland well beyond the map to the right, the community could play it safe and declare all land between Railroad Street and the Gulf as coastal A Zone for informational purposes and/or for special coastal high hazard area construction standards. Additional technical guidance on mapping coastal A Zones can be found in *Design and Construction in Coastal A Zones* at <http://www.fema.gov/library/viewRecord.do?id=2148>. Additional guidance on construction standards can be found in the *Coastal Construction Manual* (FEMA 55), *Home Builder’s Guide to Coastal Construction* (FEMA 499), and other hurricane recovery references found in the Information Resource Library at <http://www.fema.gov>.

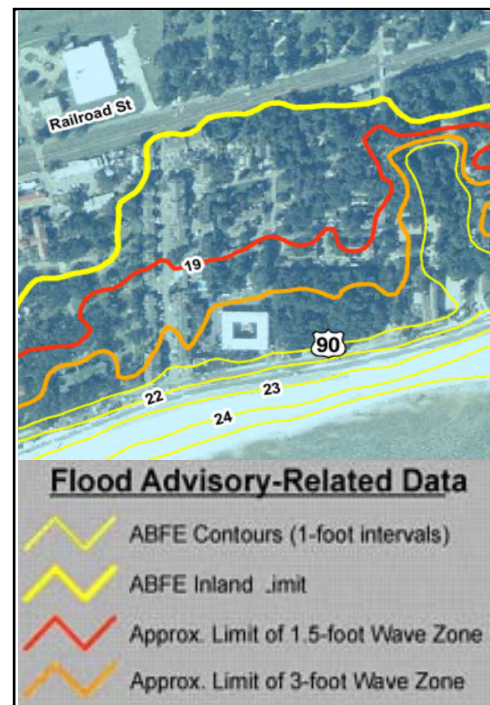


Figure 430-3. Handout on coastal A Zones.

The impact adjustment for Section 431.e, protection of critical facilities (PCF), is based on the area of the 500-year floodplain.

a. Option 1:

1. If new development within the entire area of regulated floodplain (aRF) is regulated by an element, and no credit was requested for OS in Activity 420, the impact adjustment ratio for that element = 1.0 ( $r_{XXX} = 1.0$ ).
2. If new development within the entire area of regulated floodplain (aRF) is regulated by an element, and credit was requested for OS in Activity 420, the impact adjustment ratio for that element =  $1.0 - r_{OS}$  ( $r_{XXX} = 1.0 - r_{OS}$ ).

The elements in this activity are usually implemented throughout the floodplain. Where this is the case, the community should use Option 1. Unless the community has applied for credit under Activity 420 (Open Space Preservation), the applicant can fill in the blanks on the activity worksheet for the “r” variables with “1.0.” If the community requested credit for OS in Activity 420, the impact adjustment ratios under Option 1 are reduced by  $r_{OS}$ .

Note that some elements are not enforced throughout the floodplain or for all types of development. For example, there is no credit for protecting storage capacity (PSC) in V Zones and some ordinances do not require freeboard (FRB) for floodproofing nonresidential buildings. In these cases, Options 2 or 3 must be used.

**Example 432.a-1.**

1. Watertown enforces its lower substantial improvement threshold (LSI) throughout its regulatory floodplain. Watertown did not apply for open space preservation credit under Activity 420. Under Option 1,  $r_{LSI} = 1.0$ .
2. Floodville enforces its regulation to preserve storage capacity (PSC) throughout its regulatory floodplain. Floodville applied for open space preservation credit under Activity 420. As shown in the example in Section 422.c,  $r_{OS} = 0.22$ . Under Option 1,  $r_{PSC} = 1.0 - r_{OS} = 1.0 - 0.22 = 0.78$ .

b. Option 2:

1. If new development within part of the area of regulated floodplain (aRF) is regulated by an element, default values of 0.25 may be used for the impact adjustment ratios ( $r_{XXX} = 0.25$ ).
2. For coastal AE Zone credit (CAZ), under option 2,  $r_{CAZ} = 0.1$ .

Where the standard is enforced in only some of the regulatory floodplain, the community must use either Option 2 (the default value) or Option 3. The community may use Option 2 if it results in more points than Options 1 or 3 (e.g., if more than 75% of the regulatory floodplain is preserved as open space,  $rOS > 0.75$  and Option 2 would provide more credit than Option 1).

**Example 432.b-1.** Someburg has some open space and requires freeboard only for residential buildings. Rather than prepare an Impact Adjustment Map, Someburg uses Option 2 for Activity 430:

$$rFRB = 0.25$$

c. Option 3:

The impact adjustment ratio for each element is computed by dividing the area affected by the area of the regulatory floodplain (aRF).

1. $rFRB = \frac{aFRB}{aRF}$	2. $rFDN = \frac{aFDN}{aRF}$	3. $rCSI = \frac{aCSI}{aRF}$
4. $rLSI = \frac{aLSI}{aRF}$	5. $rPCF = \frac{aPCF}{a500}$ , where a500 = the area of the 500-year floodplain	
6. $rPSC = \frac{aPSC}{aRF}$	7. $rNBR = \frac{aNBR}{aRF}$	8. $rENL = \frac{aENL}{aRF}$
9. $rOHS = \frac{aOHS}{aRF}$	10. $rCAZ = \frac{aCAZ}{aRF}$	

The area affected by a regulatory standard must exclude areas designated as open space that are receiving OS credit under Activity 420 (Open Space Preservation).

If Option 3 is used, each variable for which credit is requested must be appropriately designated on the Impact Adjustment Map described in Section 403. In many communities, these regulatory standards will be applicable throughout the community's floodplains, so a note on the key will be adequate.

Where an element applies differently to different areas, the impact adjustment ratios for each area must be computed separately.



**Example 432.c-1.** See Figure 430-3. Floodville's regulation requiring a landscaping plan is only in effect in the bottomland portion of the floodplain. The bottomlands are marked "NB" in the City's park where they receive open space credit.

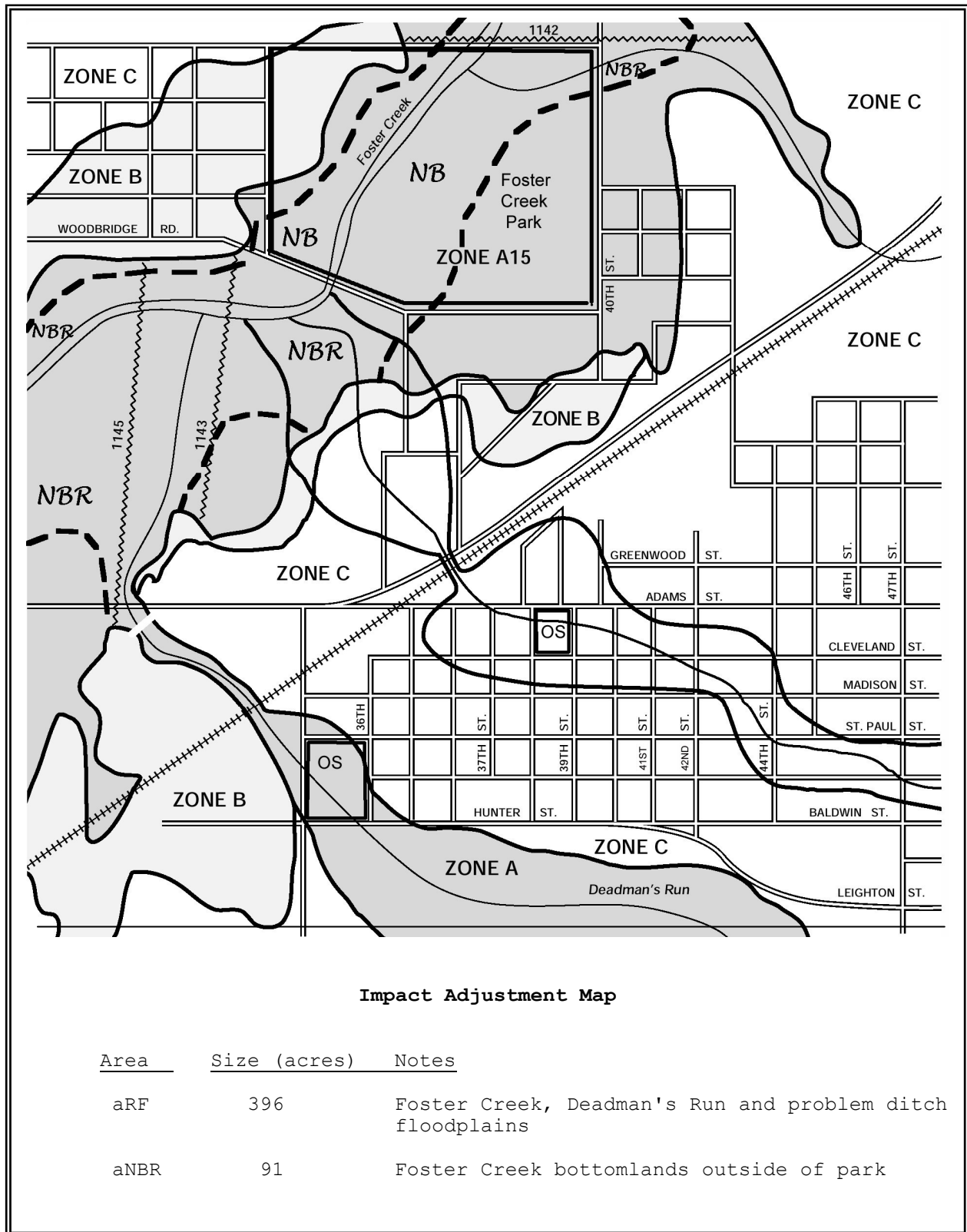
They are marked "NBR" outside of the park where future development is subject to the regulation. The area of the bottomlands outside of the park, aNBR, is 91 acres.

$$rNBR = \frac{aNBR}{aRF} = \frac{91}{396} = 0.23$$

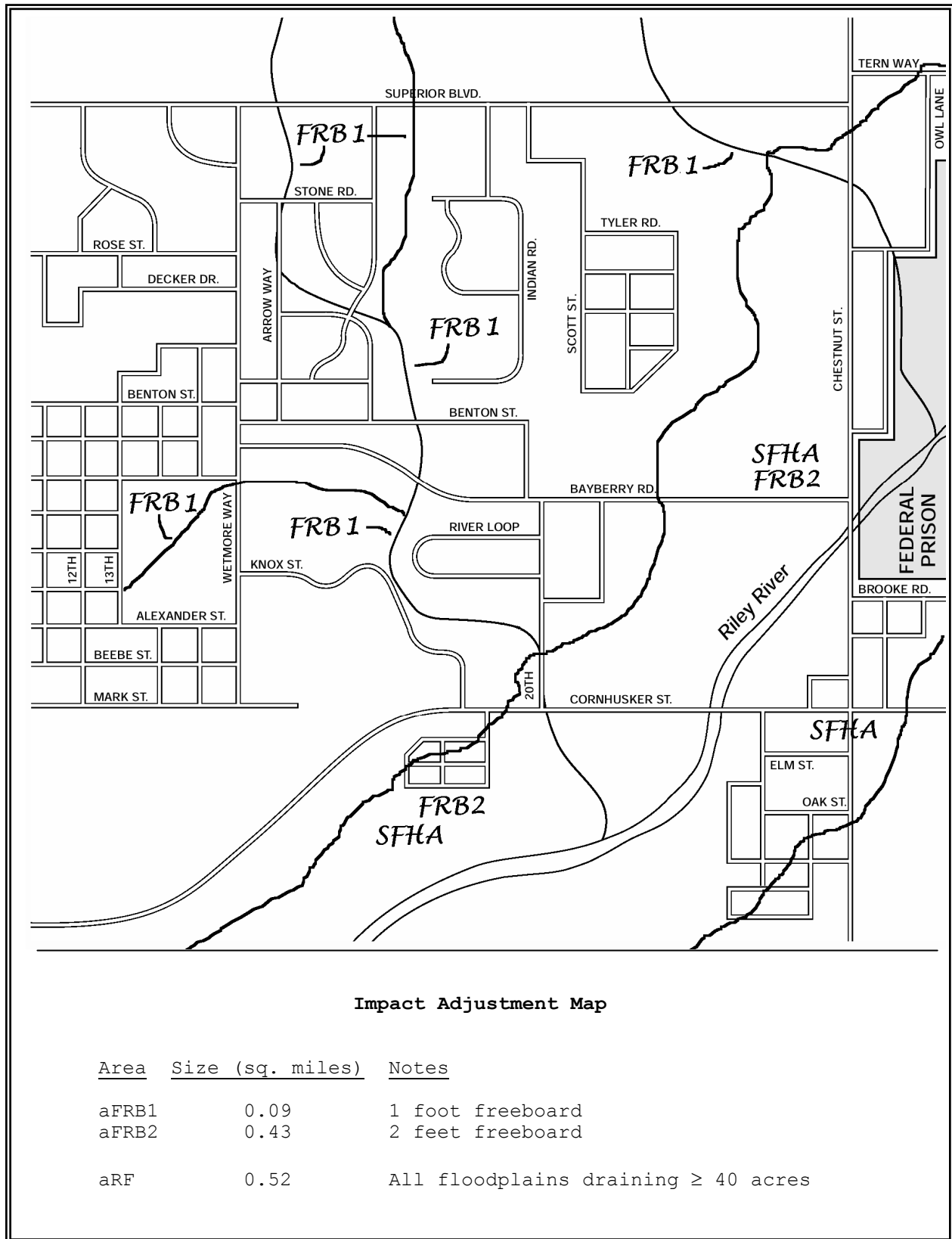
If Floodville used Option 2,  $rNBR = 0.25 - (0.25 \times rOS) = 0.25 - (0.25 \times 0.22) = 0.25 - 0.06 = 0.19$ . rNBR will be smaller under Option 2, so Floodville uses Option 3, and rNBR = 0.23.

**Example 432.c-2.** See Figure 430-4. Watertown requires 2 feet of freeboard (FRB2) in the Riley River floodplain. This is the entire mapped regulatory floodplain, so aFRB2 = aSFHA = 0.43 square miles. The City requires 1 foot of freeboard on the tributaries. These are marked FRB1 on the Impact Adjustment Map. aFRB1 = 0.09. aRF for Watertown = 0.52.

$$rFRB2 = \frac{aFRB2}{aRF} = \frac{0.43}{0.52} = 0.83 \qquad rFRB1 = \frac{aFRB1}{aRF} = \frac{0.09}{0.52} = 0.17$$



**Figure 430-4. Floodville's Impact Adjustment Map.**



**Figure 430-5. Watertown’s Impact Adjustment Map.**

### 433 Credit Calculation

- a.  $cFRB = FRB \times rFRB$
- b.  $cFDN = FDN \times rFDN$
- c.  $cCSI = CSI \times rCSI$
- d.  $cLSI = LSI \times rLSI$
- e.  $cPCF = PCF \times rPCF$
- f.  $cPSC = PSC \times rPSC$
- g.  $cNBR = NBR \times rNBR$
- h.  $cENL = ENL \times rENL$
- i.  $cOHS = OHS \times rOHS$
- j.  $cLD = c430LD$  from Section 434LD
- k.  $cSH = cSH$  from Section 434SH
- l.  $cSMS = SMS$
- m.  $cBC = BC$
- n.  $cSTF = STF$
- o.  $cMHP = MHP$
- p.  $cCAZ = CAZ \times rCAZ$
- q.  $c430 = cFRB + cFDN + cCSI + cLSI + cPCF + cPSC + cNBR + cENL + cOHS + cLD + cSH + cSMS + cBC + cSTF + cMHP + cCAZ$

**Example 433-1.** Floodville's values for higher regulatory standards are zero except for the following:

$$cPSC = PSC \times rPSC = 80 \times 0.78 = 62.4.$$

$$cNBR = NBR \times rNBR = 15 \times 0.23 = 3.45$$

$$cSMS = SMS = 10$$

$$cBC = BC = 30$$

$cSH = 16.92$  (from example in Section 434SH in *Special Hazards Supplement to the CRS Coordinator's Manual*)

$$\begin{aligned}
 c430 &= cFRB + cFDN + cCSI + cLSI + cPCF + cPSC + cNBR + cENL + \\
 &\quad cOHS + cLD + cSH + cSMS + cBC + cSTF + cMHP + cCAZ \\
 &= 0 + 0 + 0 + 0 + 0 + 62.4 + 3.45 + 0 + 0 + 0 + 16.92 + 10 + 30 + 0 + \\
 &\quad 0 + 0 = 122.77, \text{ which is rounded to } 123.
 \end{aligned}$$

During the verification visit, the ISO/CRS Specialist reviews a sample of 10 recent developments and discovers that one of the 10 received a variance from the PSC requirement. Credit for PSC is reduced by 1/10 from 80 to 72. The Specialist also noted that the value for rOS was changed from 0.22 to 0.21 when Activity 420 was verified. This increases the value for rPSC from 0.78 to 0.79. Floodville's verified credit for cPSC = 72 x 0.79 = 56.88.

$$\begin{aligned}
 c430 &= 0 + 0 + 0 + 0 + 0 + 56.88 + 3.45 + 0 + 0 + 0 + 16.92 + 10 + 30 + 0 + 0 + 0 \\
 &= 117.25, \text{ which is rounded to } 117.
 \end{aligned}$$

**Example 433-2.** See Figure 430-4 for Watertown. Watertown's values for higher regulatory standards are zero except for the following:

$$cFRB = cFRB1 + cFRB2 = (100 \times 0.17) + (200 \times 0.83) = 17 + 166 = 183.$$

$$cLSI = LSI \times rLSI = 20 \times 1.0 = 20$$

Watertown has credit for land development criteria and two areas of low density zoning in the Riley River floodplain. cLD = 217 (from example in Section 433LD).

$$\begin{aligned}
 c430 &= cFRB + cFDN + cCSI + cLSI + cPCF + cPSC + cNBR + cENL + cOHS + \\
 &\quad cLD + cSH + cSMS + cBC + cSTF + cMHP + cCAZ
 \end{aligned}$$

$$\begin{aligned}
 c430 &= 183 + 0 + 0 + 20 + 0 + 0 + 0 + 0 + 0 + 0 + 217 + 0 + 0 + 0 + 0 + 0 + 0 = \\
 &\quad 420
 \end{aligned}$$

During the verification visit, the ISO/CRS Specialist examines samples of building permits and areas of low density zoning. There are apparently no variances to the FRB or LSI requirements or the low density zoning.

## 434 Credit Documentation

The community must submit the following:

- a. The state or local law or ordinance language that adopts the regulatory standard. The appropriate acronym(s) (FRB, FDN, etc.) must be marked in the margin of the sections of the ordinance that apply to this activity. For CRS credit, the regulatory language must be adopted and in full force at the time of application for CRS credit.

A photocopy of the appropriate pages of the ordinance is sufficient and should be attached to the activity worksheet. The CEO's certification is considered to include a certification that the ordinance or statute has been enacted and is being enforced (see Section 212.a).

The community must have the following documentation available to verify implementation of this activity:

- b. [If the community determines impact adjustment ratios using Option 3 (Section 432.c)] The Impact Adjustment Map prepared in accordance with Section 403. Each area for which an impact adjustment ratio is calculated must be designated on the Impact Adjustment Map and in the map's key.
- c. An explanation of the procedures followed for enforcement of the regulatory standard and copies of relevant permit records.
- d. [If applying for credit for staffing under Section 431.n] A copy of the certificate of graduation or floodplain manager certification must be provided.

For freeboard (FRB), the community should explain its general building permit inspection process, demonstrating that this process ensures that structures are actually protected to the level required by the ordinance. Relevant permit records would include elevation certificates and floodproofing certificates that show the level to which the building is protected.

For cumulative substantial improvements (CSI), the community must demonstrate that its permit process tracks permits for a structure to ensure that the regulatory requirement is met.

### 435 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. Most state NFIP coordinating offices have prepared model ordinances with provisions that exceed the minimum NFIP standards. Additional help on regulatory provisions may be available from state planning or community affairs agencies and regional planning commissions.
- b. See Appendix E to order free copies of the following publications.
  - Special Hazards Supplement to the CRS Coordinator's Manual*
  - CRS Credit for Management of Coastal Erosion Hazards*
  - CRS Credit for Management of Tsunami Hazards.*

- c. The following documents are available from FEMA Publications by calling 1-800-480-2520 or faxing a request to (301) 362-5335.

*Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials*, FEMA-116, Federal Emergency Management Agency, 1987.

*User's Guide to Technical Bulletins*, FIA-TB-0, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/guide01.pdf>.)

*Openings in Foundation Walls*, FIA-TB-1, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job2.pdf>.)

*Flood-Resistant Materials Requirements*, FIA-TB-2, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job4.pdf>.)

*Non-Residential Floodproofing—Requirements and Certification*, FIA-TB-3, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job6.pdf>.)

*Elevator Installation*, FIA-TB-4, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job8.pdf>)

*Free-of-Obstruction Requirements*, FIA-TB-5, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job10.pdf>.)

*Below-Grade Parking Requirements*, FIA-TB-6, April 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job12.pdf>.)

*Wet Floodproofing Requirements*, FIA-TB-7, December 1993 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/job14.pdf>.)

*Corrosion Protection for Metal Connections in Coastal Areas*, FIA-TB-8, 1996 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/corr.pdf>)

*Coastal Construction Manual*, FEMA-55, Third Edition, 2000 (available in three-volume hard copy or on CD).

*Protecting Building Utilities From Flood Damage*, FEMA-348, 2000.  
<http://www.fema.gov/hazards/floods/pbuffd.shtm>

*Ensuring That Structures Built on Fill in or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding*, FIA-TB-10, 2001 (also available from FEMA's website at <http://www.fema.gov/pdf/fimal/tb1001.pdf>).

*Increased Cost of Compliance Coverage: Guidance for State and Local Officials*, FEMA, 2003.

*National Flood Insurance Program (NFIP) Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials*, FEMA 480, February 2005.

FEMA's regulations can be found at:

[http://www.access.gpo.gov/nara/cfr/waisidx\\_99/44cfrv1\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/44cfrv1_99.html)

The NFIP regulations for communities are in parts 59 through 73. The primary regulations for local floodplain management are in parts 59 and 60.

- d. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. Stipends to cover travel, registration, and rooms are usually available from FEMA. EMI conducts a home study version of "Managing Floodplain Development through the National Flood Insurance Program." For more information, call EMI at 1-800-238-3358 or the state emergency management agency's training office.
- e. More information on building codes, including the International Codes, can be obtained from the International Code Council (founded by the three former national model code organizations) at 1-800-422-7233 or <http://www.iccsafe.org/>.

*Reducing Flood Losses Through the International Code Series*, May 2000, was published jointly by the model code organizations, FEMA, the Association of State Floodplain Managers, and the American Society of Civil Engineers. Hard copies can be ordered for \$15.00 from the International Code Council at <http://www.iccsafe.org/dyn/prod/7320S1.html>. It can also be downloaded free from <http://www.fema.gov/hazards/floods/fldlosses.shtm>.

- f. For more information on floodplain manager certification, contact the Association of State Floodplain Managers at (608) 274-0123 or see <http://www.floods.org>.



## Increased Cost of Compliance

On June 1, 1997, the NFIP began offering “Increased Cost of Compliance” (ICC) coverage for buildings covered under the Standard Flood Insurance Policy (SFIP). ICC coverage provides for the payment of a claim to help pay for the cost to comply with community floodplain management ordinances after a flood event in which a building has been declared substantially damaged or repetitively damaged.

When an insured building is damaged by a flood and the community declares the building to be substantially or repetitively damaged, ICC will help pay for the cost to elevate, floodproof, demolish, or relocate the building up to a maximum of \$30,000. This coverage is in addition to the building coverage for the repair of actual physical damage from flood under the SFIP. An ICC claim can be filed whether or not a community has received a Presidential disaster declaration.

**The following conditions must be met for a substantially damaged building to be eligible for an ICC claim:** A building is eligible for an ICC claim payment if it is in a Special Flood Hazard Area and if the community determines it has been damaged by a flood whereby the cost of restoring the building to its before-damaged condition would equal or exceed 50% of the market value of the building before the damage occurred, as determined by the community. All NFIP communities must have, at a minimum, a substantial damage provision in their floodplain management ordinance in accordance with the NFIP criteria.

The Flood Insurance Reform Act of 2004 expanded the definition of what qualifies as substantial damage. Section 105(b)(4) of the Act reads, “the term ‘substantially damaged structure’ means a structure covered by a contract for flood insurance that has incurred damage for which the cost of repair exceeds an amount specified in any regulation promulgated by the Director, or by a community ordinance, whichever is lower.” After FEMA regulations are published to implement this provision, regulations with substantial damage thresholds lower than 50% that qualify for LSI credit may also be able to trigger ICC claim payments. Communities with LSI credit should check with their FEMA Regional Offices (Appendix A) to confirm this.

**The following conditions must be met for a repetitively damaged building to be eligible for an ICC claim payment:** A building is eligible for an ICC claim payment if it is in a Special Flood Hazard Area and is a repetitive loss structure and is subject to a community floodplain management ordinance. Two conditions must be met for an ICC claim to be paid under the SFIP for a repetitive loss structure:

1. The state or community must have adopted and be currently enforcing a repetitive loss provision or a cumulative substantial damage provision requiring action by the property owner to comply with the community’s floodplain management ordinance, and
2. The building must have a history of NFIP claim payments that satisfies the statute’s definition of “repetitive loss structure.” A repetitive loss structure means “a building covered by a contract for flood insurance that has incurred flood-related damage on 2 occasions during a 10-year period ending on the date of the event for which a second claim is made, in which the cost of repairing the flood damage, on the average, equaled or exceeded 25% of the market value of the building at the time of each such flood event.” *Note that this statutory ICC definition is not the same as the CRS definition of a repetitive loss property.*

**Figure 430-6a. Increased Cost of Compliance flood insurance coverage.**

### **Increased Cost of Compliance (cont.)**

The date on which the first loss occurred, even if the loss occurred before June 1, 1997, is immaterial to eligibility for an ICC claim payment, as long as the state or community enforced a repetitive loss or cumulative substantial damage requirement on the building and the insured building satisfies the definition of the “repetitive loss structure” defined above.

**CRS NOTE:** *Communities receiving CSI credit for a cumulative substantial improvement regulation must be aware that there may be instances in which the community’s criteria may require compliance with its floodplain management ordinance, but the building may not qualify for an ICC claim payment (e.g., if a building is damaged three times, with each flood averaging 20% damage).*

Below are two options for ordinance language that is consistent with the definition of “repetitive loss structure” under the NFIP. The language would receive 20 points under CSI—fewer points than the more restrictive language of Sections 431.c.1(a) and (b).

Additional guidance on ICC coverage can be found in *Increased Cost of Compliance Coverage: Guidance for State and Local Officials*, FEMA 2003.

#### **Option 1:**

##### **A. Adopt the Following Definition:**

“Repetitive loss” means flood-related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25% of the market value of the structure before the damage occurred.

##### **B. And modify the “substantial improvement” definition to read as follows:**

“Substantial improvement” means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the “start of construction” of the improvement. This term includes structures that have incurred “repetitive loss” or “substantial damage,” regardless of the actual repair work performed.

#### **Option 2: Modify the “substantial damage” definition to read as follows:**

“Substantial damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damage condition would equal or exceed 50% of the market value of the structure before the damage occurred. Substantial damage also means flood-related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25% of the market value of the structure before the damage occurred.

**NOTE:** *An ICC claim payment is ONLY made for flood-related damage. The substantial damage part of the definition must still include “damage of any origin” to be compliant with the minimum NFIP floodplain management regulations.*

**Figure 430-6b. Increased Cost of Compliance flood insurance coverage (page two).**



## 440 FLOOD DATA MAINTENANCE

### Summary of Activity 440

**441 Credit Points.** There are four elements in this activity for a maximum of 239 points (excluding special hazards credit).

- a. Additional map data (AMD): Up to 129 points are provided for implementing digital or paper systems that improve access, quality, and/or ease of updating flood data within the community. Each system must be used by the local regulatory staff on a regular basis. The data in the system must be updated at least annually.
- b. Benchmark maintenance (BMM): Up to 90 points are provided for a program that maintains benchmarks so surveyors can find them and can depend on them to be accurate.
- c. Erosion data maintenance (EDM): Points are provided for maintaining coastal erosion data as described in *CRS Credit for Management of Coastal Erosion Hazards*.
- d. FIRM maintenance (FM): Up to 20 points for maintaining copies of all Flood Insurance Rate Maps (FIRMs) that have been issued for the community.

**442 Impact Adjustment.** The credit points for each element are adjusted in one of three ways.

- a. Under Option 1, if the program is implemented throughout the Special Flood Hazard Area (SFHA), the impact adjustment ratio for an element is 1.0.
- b. Under Option 2, if the program is not implemented throughout the SFHA, a default impact adjustment ratio of 0.25 may be used.
- c. Under Option 3, if the program is not implemented throughout the SFHA, the impact adjustment ratios may reflect the proportion of the SFHA affected.

**443 Credit Calculation.** The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

**444 Credit Documentation.** The community must have the following available to verify implementation of this activity.

- a. A summary of all elements of its flood data maintenance program and a description of how these elements are used and updated on a regular basis.
- b. [If the community calculates impact adjustment factors using Option 3 (Section 442.c)] The Impact Adjustment Map discussed in Section 403.
- c. Copies of the digitized mapping, parcel records, and/or overlay maps, benchmark data, erosion data, shoreline erosion records, and/or old FIRMs, as appropriate.
- d. [If the community is applying for credit for maintaining benchmarks (BMM)] Key data on the qualifying benchmarks, a map of their locations, and surveyor's statement that they meet the element's prerequisites (for those benchmarks not in the NSRS).

The community must submit the following documentation with its annual CRS recertification:

- e. Identification of any reference marks that appear on the FIRM that were found to be missing or inaccurate.

**445 For More Information.**

## 440 FLOOD DATA MAINTENANCE

Credit is provided for making the community's floodplain maps more current, useful, or accurate in order to improve local regulations, planning, disclosures, and property appraisals.

**Background:** Outdated mapping hinders good floodplain management. A Flood Insurance Rate Map (FIRM) can and should be updated frequently to account for study revisions, site-by-site analyses, better ground elevation data, annexations, and incorporation of new hazard data. To keep a FIRM updated at minimal cost, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) publishes Letters of Map Revision. However, these do not provide local officials and other map users with a meaningful picture of the floodplain.

**Activity Description:** Under this activity, credit is provided for putting National Flood Insurance Program (NFIP) FIRM and Flood Boundary and Floodway Map delineations on a digitized mapping system or other method that allows quick revision and reprinting of a floodplain map. Flood hazard data could also be maintained on computerized parcel records. This activity also includes credit for adding and/or maintaining benchmarks and overlaying the community's floodplain mapping (including the FIRM) on the zoning map, the assessor's map, or other map used regularly by community staff.

A computerized parcel system is often easier to use than a map. With such a system, a building official, real estate agent, or anyone interested in the flood hazard on a property can quickly find data such as flood zone number, flood elevations, and lowest floor elevation. In most cases, flood data are maintained for a community's entire floodplain. Where this is not the case, the areas affected must be adjusted by an impact adjustment ratio based upon the area of regulated floodplain with the community.

Maintaining current benchmarks makes it easier and less expensive for developers and property owners to determine ground, floor, and base flood elevations for construction and flood insurance purposes.

***NOTE:** This activity only credits maintenance of the community's regulatory flood data. The paper FIRM is still the document used for flood insurance rates and the mandatory purchase requirement. However, if the community's flood data maintenance program finds an error in the FIRM, it should be reported to FEMA so it can be included in the next map revision. If the error would remove a property from the SFHA, it is assumed that the owner will be motivated to request a map amendment.*

## 441 Credit Points

Maximum credit for Activity 440: 239 points.

a. Additional map data (AMD) (Maximum credit: 129 points)

This element credits digital or paper systems that improve access, quality, and/or ease of updating flood and FIRM data.

1. Prerequisites.

(a) The system must be used regularly by the community regulatory staff.

(b) New data, including annexations, new subdivision maps, flood insurance restudies, letters of map revision, letters of map amendment, and studies performed for site-specific analyses, must be added at least annually to the data base or overlay map.

(c) Digitized data must be made available annually to FEMA at no cost (if requested).

Three different types of flood data maintenance systems are usually eligible for credit:

- Map overlays, such as overlaying the regulatory floodplain on the zoning map, aerial photograph, or more detailed street map; or using clear plastic sheets over the FIRM to record map changes.
- A geographic information system (GIS), computer aided design (CAD), or other digitized system that updates information electronically and can display or print a current map.
- A database management program for parcel records that maintains the appropriate flood data for each property. Some communities have master parcel record systems that can be accessed for building permit records, property tax information, FIRM data, and other purposes. Sometimes these systems are tied into a GIS. Credit is given if parcels in this system are designated as “in” or “out” of the floodplain.

Data available from these three systems improve the community’s administration of its floodplain management program. Credit is dependent on the map data being used in the community’s regulatory program. There is no credit for a map system that is used only for planning drainage projects or other non-regulatory purpose. The objective of this requirement is to encourage more community offices to be familiar with the local flood problems and to reduce the likelihood that land use or development decisions will be made without

considering the hazard. Using the system to provide map determinations to the permit office is considered a regulatory purpose.

The data from a digitized mapping or parcel system must be provided to FEMA if it is requested. A fee may be charged to other requestors based on the actual cost of retrieval or reproduction.

The Community Rating System (CRS) encourages communities to devote special attention to areas affected by the special flood-related hazards listed in Section 401. Communities affected by one or more of these hazards should obtain a copy of the appropriate CRS publication (see Appendix E), which shows how to increase credit points for regulating development in areas affected by these special hazards. Regulating such areas is a prerequisite to receiving credit for including the area in this activity.

2. Credit points: AMD = the total of the following points based on the types of data included in the data maintenance system, except that no credit is provided unless item (a) is included:
  - (a) 32, for showing the regulatory floodplain boundaries, corporate limits, streets, and parcel or lot boundaries (a database management program must show whether a parcel is in the regulatory floodplain);
  - (b) 15, for a GIS layer that shows buildings, building outlines, or building footprints (a database management program must show whether the primary building on the lot is in the regulatory floodplain), and the building data is kept up to date to reflect new construction;
  - (c) 8, for showing floodways or coastal high hazard areas (a database management program must show whether either the parcel or the primary building is in the floodway or coastal high hazard area);
  - (d) 8, for showing base flood elevations;
  - (e) 6, for including FIRM zone attributes (e.g., A3, VE, etc.);
  - (f) 8, for showing the 500-year floodplain elevations or boundaries (a database management program would show whether the parcel is in the 500-year floodplain);
  - (g) 8, for showing areas of the community subject to other natural hazards (a database management program would show whether the parcel is subject to another hazard);

(h) EITHER:

- (1) 10, if the community's GIS includes topographic contour lines; OR
- (2) 20, if the system includes topographic contour lines at a smaller contour interval than that provided on available U.S. Geological Survey digital orthophoto quarter quads (DOQQ);
- (i) 8, for including updated floodplain data in the tax assessment data base;
- (j) 8, for including overlays or layers for all FIRMs in effect after the date of the community's application to the CRS; and
- (k) 8, for other overlays or databases used for regulation or mitigation programs, including incorporating and maintaining layers from HAZUS-MH and the community's repetitive loss areas.

Most of the credited items are important to provide the regulatory staff the latest FIRM data for a property. The CRS wants to encourage users of the community's system, including tax assessors and property appraisers, to be aware of the flood hazard. The CRS also wants to encourage keeping old FIRMs to help track substantial improvement requirements and eligibility for grandfathered flood insurance premiums. Old maps are hard to obtain, so keeping them on record would provide a valuable service to residents.

Item 2(g) credits showing areas of the community subject to other natural hazards. Local permitting and planning should be aware of all hazards to which a property is exposed. These could include landslide-prone areas, areas subject to subsidence or stream migration, and areas with soils unsuitable for septic fields. Including these hazards in GIS layers that are seen when permits are reviewed or when plans are being drafted will remind everyone involved of the need to protect people and property from those hazards.

For item (h), credit is provided for including a layer with contour lines in the community's GIS. If the layer has contour intervals smaller than what is available from the U.S. Geological Survey's DOQQs, then 20 points are provided. In those areas where there are no DOQQs, the credit is provided if the contour interval is smaller than that on the area's USGS quadrangle maps.

HAZUS-MH (Hazards U.S.–Multi-Hazard) is FEMA's standard, nationally applicable methodology and software program for estimating potential losses from earthquakes, floods, and hurricane winds. HAZUS-MH uses ESRI's ArcGIS geographic information system software platform to analyze, map, and display potential damage and losses. The CRS encourages the use of HAZUS-MH to promote a greater understanding and awareness of hazard risk and for keeping the HAZUS-MH database updated. See Figure 510-1 for more information on HAZUS-MH.)



Identifying and mapping the community’s repetitive loss areas is discussed in Sections 502 and 503. A repetitive loss community must also develop a list of addresses of the improved properties in its repetitive loss areas. This work can be greatly facilitated by the use of a GIS. Once a repetitive loss area layer is developed, it should be used during mitigation planning and other activities focused on reducing the community’s flood problems.

**NOTE:** *If a community maintains data on its repetitive loss properties, it must be remembered that such data may be subject to the Privacy Act. Information such as the names of people and addresses of properties that have received repetitive flood insurance claims and the amounts of such claims may only be used by the community in furtherance of local flood loss reduction. Communities are prohibited from releasing such information to the public and from using it for solicitation or other purposes. Such information should be marked “For internal use only. This information is legally privileged and confidential. Its use is protected by the Privacy Act of 1974.” Generic information, such as total claim payments for an area or data not connected to a particular property, may be made public.*

**Example 441.a-1.** Floodville has overlaid the regulatory floodplain and floodway boundaries, with base flood elevations, onto the zoning and land use plan maps used to administer the zoning ordinance, the building and health codes, and the regulations for new subdivisions. The maps are updated at least annually. The maps include streets, corporate limits, and parcels.

$$AMD = 32 + 0 + 8 + 8 + 0 + 0 + 0 + 0 + 0 + 0 + 0 = 48$$

b. Benchmark maintenance (BMM) (Maximum credit: 90 points)

This element credits a program that maintains benchmarks so surveyors can find them and can depend on them to be accurate.

1. Prerequisites: credit is provided for each benchmark that meets the following criteria:
  - (a) It must be a benchmark that is EITHER:
    - (1) In the National Spatial Reference System (NSRS) database; OR
    - (2) A permanent monument with key data posted in a reference system readily available to local surveyors, such as the community’s website.
  - (b) There must be a note that it has been recovered within the last five years;
  - (c) It must be a first- or second-order vertical control benchmark;

- (d) It must have a stability rating of A or B; AND
- (e) It must be within one (1.0) mile of some part of the community's regulatory floodplain.
2. Credit points:
- (a) NBM = the number of qualifying benchmarks in the community.
- (b) NBM = 1.5, if the benchmark is also entered into the National Spatial Reference System (NSRS) database.
- (c) 
$$\text{NBM} = \frac{15 \times \text{NBM}}{\text{aRFM}}$$
- where aRFM is the area of the community's regulatory floodplain in square miles.

The National Spatial Reference System (NSRS) is maintained by the National Geodetic Survey (NGS) in the U.S. Department of Commerce. It is a compendium of vertical and horizontal benchmarks for the country. This element provides credit for a community's having a sufficient number and density of good benchmarks in the NSRS. If the community does not, it is encouraged to either survey new ones or submit the data necessary to add qualifying existing benchmarks to the national system.

Any surveyor can create a NSRS benchmark. Surveyors must follow strict NGS guidelines for the type of monument set and the accuracy of the survey that establishes the horizontal location of the monument and/or the elevation. After review by the NGS, these benchmarks are added to the NSRS database, which is available to surveyors and the public on the internet.

If the community has a network of quality benchmarks that are permanent monuments but are not entered into the NSRS, it must provide a statement, signed by a licensed surveyor, that each benchmark for which credit is requested is a monument that would qualify for addition to the NSRS if it were submitted to the NGS.

“Permanent monuments” are engraved metal discs at least 2 inches in diameter set in concrete or similar markers that are recognizable, durable, and immovable or steel rods driven to resistance. Chiseled squares in sidewalks, parts of fire hydrants, nails in telephone poles, “PK nails” in pavement, etc., are not “permanent monuments.”

For this credit, a benchmark must meet all of the prerequisites:

- (1) It must be in the NSRS database, or it must be in a database maintained by the community or other authority that is readily available to local surveyors. This may be in the form of a published book or a website. The database must include key data, such as the location and description of the benchmark, the elevation and datum, and when it was last recovered.

- (2) There must be a note that it has been recovered within the last five years. If a benchmark has not been recovered in the last five years (i.e., no one has confirmed to NSRS that the site has been found), a local official or surveyor can locate the monument and report that it has been recovered. In some cases, the community or local surveyors may need to recover all credited benchmarks to maintain this credit at each cycle verification visit. Recovery can be reported by any local official—it does not have to be a licensed surveyor. (The NSRS website explains the process to report recovery.)
- (3) It must be a first- or second-order vertical benchmark. The “order” tells how close the results were when the surveyor who set the benchmark completed a circuit back to the starting point. Lower-order benchmarks are not as dependable.
- (4) It must have a stability rating of A or B. The NSRS describes whether a benchmark is likely to move over time with the following system:
  - A = most reliable and expected to hold an elevation (e.g., bedrock)
  - B = probably will hold an elevation well (e.g., a massive bridge pier)
  - C = may hold, but of a type commonly subject to ground movement (e.g., a building foundation)
  - D = mark of questionable or unknown stability

Some areas subject to land subsidence may not have any benchmarks rated A or B. If the community has an alternative way to provide dependable elevation data, it may submit a description of its alternative. An example would be a program that resurveys benchmarks every few years.

- (5) It must be within one mile of some part of the community’s regulatory floodplain. For this credit, the community must submit a map showing the location of the qualifying benchmarks.

**Example 441.b-1.** Floodville has two vertical control benchmarks that meet the prerequisites. One is listed in the National Spatial Reference System and the other is posted on the city engineering department’s website. (NBM = 1 + 1.5 = 2.5). The area of Floodville’s regulatory floodplain is 396 acres or 0.62 square miles.

$$\text{BMM} = \frac{15 \times \text{NBM}}{\text{ARFM}} = \frac{15 \times 2.5}{0.62} = \frac{37.5}{0.62} = 60.48$$

Floodville could increase its credit for BMM to the maximum 90 points if it had four benchmarks that were entered into the NSRS. It may be that the NSRS has one or two qualifying benchmarks that would provide the city with this credit if the City simply found them and reported them as recovered..

c. Erosion data maintenance (EDM)

Credit for maintaining coastal erosion data is described in *CRS Credit for Management of Coastal Erosion Hazards*. The credit points, EDM, are calculated separately and transferred to this activity.

This credit is for including coastal erosion rates and similar data in a GIS, digitized parcel data, or overlay map. More information and credit point calculations can be found in *CRS Credit for Management of Coastal Erosion Hazards* (see Appendix E).

d. FIRM maintenance (FM) (Maximum credit: 20 points)

Credit is provided for maintaining earlier editions of flood insurance maps. The maps must be readily available and the community must allow inquirers access to them.

FM = the total of the following points:

1. 15, for maintaining copies of all FIRMs, Flood Insurance Studies, and Flood Boundary Floodway Maps that have been issued for the community. There is no credit if the FIRM has never been revised.
2. 5, for maintaining copies of all Flood Hazard Boundary Maps that were issued for the community.

To receive credit under Activity 320 (Map Information Service), the community must maintain copies of old FIRMs that have been in effect since 1999 or the date the community applied to the CRS, whichever is later. Under this element, credit is provided for maintaining copies of ALL FIRMs, i.e., each FIRM that appears on the list of FIRM revisions in the legend of each FIRM. Keeping the community's current FIRM is a minimum requirement of the NFIP, so if the community has only been issued one FIRM, there is no credit under this element.

Additional credit is provided for maintaining copies of the Flood Hazard Boundary Maps (FHBMs), i.e., the FEMA maps published before the community received its first FIRM.

This credit is provided for maintaining the FIRMs and FHBMs in paper, microfilm, or other format. They do not have to be part of the system credited under Section 441.a (AMD).

Copies of old FIRMs and FHBMs may be available from the Map Coordination Contractors (see Section 445.e).

## 442 Impact Adjustment

Credit for additional map data (AMD) and benchmark maintenance (BMM) are adjusted according to the portion of the area of regulatory floodplain (aRF) that the element covers:

a. Option 1:

1. If the data for the entire regulatory floodplain have been entered into the system or included on the overlay map, rAMD = 1.0.
2. If the credited benchmarks cover the entire regulatory floodplain, rBMM = 1.0.

b. Option 2:

1. If the data for only part of the regulatory floodplain have been entered into the system or included on the overlay map, the community may use the default values: rAMD = 0.25.
2. If the credited benchmarks cover part of the regulatory floodplain, the community may use the default value: rBMM = 0.25.

c. Option 3:

1. The impact adjustment ratio is computed by dividing the area for which data have been entered into the computer or added to the overlay map by the area of the regulatory floodplain (aRF):

$$rAMD = \frac{aAMD}{aRF}$$

2. The impact adjustment ratio is computed by dividing the area covered by the credited benchmarks by the area of the regulatory floodplain (aRF):

$$rBMM = \frac{aBMM}{aRF}$$

If the program is implemented in only a portion of the regulatory floodplain, the community may use either Option 2 or Option 3. For example, if a county has only entered flood data for its urbanized areas into a GIS, it may use the default value rAMD = 0.25, or it may determine aAMD and aRF to calculate rAMD and designate the areas on its Impact Adjustment Map.

**Example 442-1.** Floodville’s overlay map covers the entire community and includes all floodplains. Using Option 1,  $rAMD = 1.0$ .

If a community has different systems for different areas of the community, it should designate and score each one separately and the total score will be corrected through the impact adjustment.

**Example 442-2.** Gulf Beach County has a GIS for the developed area along the coast. For inland rural areas, the staff refers to map overlays. The GIS would be designated “AMD1” and the area not covered by the GIS would be “AMD2.” The two systems would be scored and, if together they covered the entire county,  $rAMD1$  plus  $rAMD2$  would equal 1.0.

d. There is no impact adjustment for EDM or FM.

### 443 Credit Calculation

- a.  $cAMD = AMD \times rAMD$
- b.  $cBMM = (BMM \times rBMM)$
- c.  $c440 = cAMD + cBMM + EDM + FM$

**Example 443-1.** As noted above, AMD for Floodville = 48 and  $rAMD = 1.0$ .

$$cAMD = 48 \times 1.0 = 48$$

Floodville’s credit for benchmarks is explained in Example 441.b-1. Because the system covers the entire regulatory floodplain, option 1 is used and  $rBMM = 1.0$ .

$$cBMM = 60.48 \times 1.0 = 60.48$$

Floodville’s staff cannot find copies of earlier FIRMs:  $FM = 0$ .

Floodville has no coastal erosion areas:  $EDM = 0$ .

$$c440 = cAMD + cBMM + EDM + FM = 48 + 60.48 + 0 + 0 = 108.48$$

## 444 Credit Documentation

The community must submit the following:

- a. A short summary of all elements of its flood data maintenance program, or a sample copy of the item for which credit is requested, which clearly shows all of the items to be credited.

For credit for computerized data, the summary should briefly discuss the computer system used, the types of data included in the system, access to the data, and how the system is used for floodplain management. For the other systems, the summary should consist of a short narrative description of the procedure and how it is used by the community for floodplain management.

The community must have the following available to verify implementation of this activity:

- b. [If the community calculates impact adjustment ratios using Option 3 (442.c)] The Impact Adjustment Map discussed in Section 403. Each area listed in Section 441 for which credit is being requested must be shown on the Impact Adjustment Map and in the key.
- c. Copies of the digitized mapping, parcel records, overlay maps, shoreline erosion records, and/or old FIRMs, as appropriate.

If the community has a GIS or a database management program for parcel records, it should be able to prepare a printout or a disk with the addresses of all the properties in the floodplain. This would facilitate mailing its outreach project to floodplain residents (OPF) under Activity 330 (Outreach Projects).

d. [If the community is applying for credit for maintaining benchmarks (BMM)]

1. The data for the qualifying bench marks that are in the NSRS or the community's publicly accessible database. This must include key data, such as the location and description of the benchmark, the elevation and datum, and when it was last recovered;
2. For those benchmarks that are not in the NSRS, a statement signed by a licensed surveyor that states that they meet the element's prerequisites, and
3. A map showing the locations of the listed benchmarks.

The data can be in the form of a printout of the NSRS datasheets, a photocopy of the relevant pages of the community's benchmark book, or the URL for the website database. The surveyor's statement does not need to be certified or sealed, but does need to include the signator's license number. The map can be a street map, a floodplain map, or any map that facilitates finding the benchmarks on the ground. The NSRS retrieval maps do not qualify because they do not show or name enough features.

The community must submit the following with its annual CRS recertification:

- e. Identification of any benchmarks that appear on the FIRM that were found to be missing or inaccurate.

If any benchmarks are found to be listed incorrectly, the community should provide FEMA with the correct elevations or information on other benchmarks. Otherwise, revised FIRMs will continue to show the incorrect information.

#### 445 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. The following documents are available from

FEMA Distribution Center  
P.O. Box 2010  
Jessup, MD 20794-2012  
1-800-480-2520  
Fax: (301)-362-5335

*National Flood Insurance Program Standards for Digital Flood Insurance Rate Maps*, October 1993.

*Flood Insurance Study Guidelines and Specifications for Flood Hazard Mapping Partners*, 2003, or [http://www.fema.gov/fhm/gs\\_main.shtm](http://www.fema.gov/fhm/gs_main.shtm).

- b. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.
- c. The U.S. Army Corps of Engineers can provide assistance with benchmarks and mapping issues. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps.



- d. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. Three or four times each year, it offers the “Digital Hazard Data Course” on digital FIRMs and other computer databases. Stipends to cover travel, registration, and rooms are usually available from FEMA. For more information, call EMI at 1-800-238-3358 or the state emergency management agency’s training office.
- e. Communities may check on past FIRMs and obtain background data by calling 1-877-FEMA MAP. They can also submit a written inquiry through this link: [http://www.fema.gov/fhm/tsd\\_emap.shtm](http://www.fema.gov/fhm/tsd_emap.shtm).

For Regions I—V, contact Dewberry & Davis at (703) 849-0100 or see the website at <http://www.Dewberry.com>.

For Regions VI—X, contact Michael Baker, Jr., at (703) 329-3023 or see the website at <http://www.bakerprojects.com/fema>.

- f. Information on the National Spatial Reference System (NSRS) can be found at <http://www.ngs.noaa.gov>. Benchmarks entered into the system are recorded on datasheets at <http://www.ngs.noaa.gov/cgi-bin/datasheet.prl>.

## 450 STORMWATER MANAGEMENT

### Summary of Activity 450

**451 Credit Points.** There are five elements in this activity for a maximum of 670 points.

- a. Stormwater management regulations (SMR): Up to 225 points are provided for regulating developments on a case-by-case basis to ensure that the peak flow of stormwater runoff from each site will not exceed the predevelopment runoff. SMR credit is the sum of three subelements:
  1. Size of developments regulated (SZ): Up to 25 points.
  2. Design storms used in regulations (DS): Up to 90 points.
  3. Public maintenance of required facilities (PUB): Up to 110 points.
- b. Watershed master plan (WMP): Up to 225 points are provided for regulating development according to a watershed management master plan.
- c. Freeboard for new buildings in B, C, D, and X zones (FRX): Up to 150 points are provided for requiring all new buildings (not just those in floodplains) to be protected from local drainage problems.
- d. Erosion and sedimentation control regulations (ESC): Up to 45 points are provided for regulations to minimize erosion from land disturbed due to construction or farming.
- e. Water quality regulations (WQ): 25 points are provided for regulations that improve the quality of stormwater runoff.

**452 Impact Adjustment.** The credit points for SMR and WMP are adjusted in one of three ways. The standards for the other elements must apply throughout the community, so there is no impact adjustment for them.

- a. Under Option 1, if the standards apply throughout all watersheds affecting the community, the impact adjustment ratio for an element is 1.0.
- b. Under Option 2, if the standards do not apply throughout all watersheds affecting the community, a default impact adjustment ratio of 0.25 may be used.
- c. Under Option 3, if the standards do not apply throughout all watersheds affecting the community, the impact adjustment ratios may reflect the proportion of the watersheds affected.

**453 Credit Calculation.** The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

**454 Credit Documentation.** The community must submit the following:

- a. [If requesting credit for SMR] A copy of the language from the ordinance or law that tells how surface water runoff from new development is regulated.
- b. [If requesting credit for WMP] Certification and appropriate pages from the watershed master plan.
- c. [If requesting credit for FRX] A copy of the language from the ordinance or law that requires elevation of the lowest floor or lowest opening of new buildings.
- d. [If requesting credit for ESC] A copy of the erosion and sediment control ordinance or law.
- e. [If requesting credit for WQ] A copy of the language from the ordinance or law that requires new developments to implement appropriate best management practices.
- f. [If impact adjustment ratios use Options 1 or 3] An Impact Adjustment Map showing the watershed boundaries and stormwater management jurisdiction.
- g. [If impact adjustment ratios include areas regulated by another community(ies)] Documentation of the other community's (or communities') regulation.
- h. [If requesting credit for PUB] A copy of inspection and maintenance procedures for drainage facilities.

The community must have the following available to verify implementation of this activity:

- i. Development and building permit records that demonstrate enforcement of the regulations.
- j. An evaluation report on the effectiveness and currency of the stormwater management plans.

**455 For More Information.**

## 450 STORMWATER MANAGEMENT

*NOTE: A separate publication, **CRS Credit for Stormwater Management**, provides an example of a community program and application documentation. Communities are encouraged to obtain and read this document before applying for this activity. It will improve the quality of the application and reduce the need to provide additional documentation later. To order a free copy, see Appendix E.*

Credit is provided for regulating new developments to minimize their impact on surface water drainage and runoff.

**Background:** One of the greatest problems of floodplain management in urbanizing areas is the increase in peak flow caused by watershed development. As forests, fields, and farms are covered by impermeable surfaces, such as streets, rooftops, and parking lots, more rain runs off at a faster rate. When an area is urbanized, the rate of runoff can increase five-fold or more.

A great deal of damage from local drainage problems can be avoided by requiring all structures to be elevated. Sediment from disturbed ground can reduce the capacity of the drainage system and adversely affect water quality.

This problem is compounded by changes in the surface drainage system. Stormwater runoff travels faster on streets and in storm drains than under pre-development conditions. As a result, flooding is more frequent, happens more quickly, and is more severe.

**Activity Description:** This activity credits five approaches to regulating new development in the watershed:

1. Regulating developments on a case-by-case basis to ensure that the peak flow of stormwater runoff from each site will be no greater than the runoff from the site before it was developed;
2. Regulating developments according to a watershed management master plan that analyzes the combined effects of existing and expected development on drainage through and out of the watershed;
3. Requiring all new buildings (not just those in the floodplain) to be elevated to protect them from local drainage problems;
4. Regulating activities throughout the watershed to minimize erosion that results in sedimentation; and
5. Regulating the quality of stormwater runoff.

These five approaches are discussed in more detail below.

1. Because the amount of runoff is generally increased by development, stormwater management usually requires that a volume of flood water be stored during the storm. It is released after the runoff subsides (stormwater DETENTION). A developer may store this excess runoff for a short time so that it may be used for irrigation or groundwater recharge or to reduce pollution (stormwater RETENTION). Where retention is used for stormwater management, the detained runoff is not discharged until after the storm has passed and the receiving body can carry the discharge without causing damaging peak flows anywhere downstream.

Detention does not reduce the amount of water flowing downstream, it simply lets it out over a longer period of time to reduce the peak flow. This can still cause flooding problems farther downstream and the extra flows can destabilize channel banks and cause other problems. Therefore, stormwater retention is preferred over detention. If stormwater retention is allowed, the community must ensure that adequate storage is again available within a reasonable time should another storm occur.

Maintenance of these facilities is vital—if they silt in or become clogged, they provide no flood protection benefits.

2. Watershed master plans can be used to determine the appropriate amount of detention or retention necessary to prevent an increase in runoff as development occurs within the watershed. A master plan coordinates the timing and total volume of peak flows from subwatersheds in order to provide better data for development standards.

Although there is no doubt that stormwater regulation reduces the future flood threat from a developing area, a master plan goes much further in predicting the rainfall/runoff relationships within the watershed and in locating and dealing with specific problems as development progresses.

3. Much of the nation's flood damage (including one-third of all flood insurance losses) occurs in B, C, and X Zones. A large portion of this damage would be prevented by requiring ALL new development to be elevated. This is usually done by requiring lowest floors or basement openings to be elevated above street level.
4. Sediment control is especially important in watersheds where land is being disturbed by construction or farming. Drainage systems cannot operate as designed if they are choked with sediment washed in from construction sites. Sedimentation has also been called the largest source of water pollution in the country.
5. Stormwater runoff picks up dirt, road oil, salt, farm chemicals, and other substances. Unlike sewage, stormwater is not treated before it enters rivers, lakes, estuaries, and other receiving bodies of water. Regulations that require developers to install or implement measures that improve the quality of stormwater are credited.

Unless care is taken to avoid it, each new development in a watershed increases the runoff from the newly developed area, and flood peaks and flood volumes increase farther down the watershed as development continues. Many communities and some states now require that the runoff from new development be managed to reduce this increase in runoff. SMR credit is provided for this regulation.

The term “stormwater management” is also widely used in programs intended to maintain or improve the quality of stormwater runoff. Such water quality programs are provided CRS credit under Section 451.e, below. These programs frequently regulate a relatively small level of runoff, such as the first half-inch of runoff or the runoff from a 2-year storm.

Credit for stormwater management regulations (SMR) is provided for regulation of new development to prevent future increases in flood damage that result from development in the watershed. Therefore, SMR credit is only provided for regulation of runoff from a 10-year storm or larger. More credit is provided for regulation of larger storms and maximum credit is provided if runoff from both small and large storms is regulated.

Stormwater management regulation credited under Section 451.a (SMR) helps to manage increased runoff from a developing watershed, but it does not solve the problem entirely. The flood peak at a point downstream in a watershed is a result of both the quantity of upstream runoff and the time it takes for water to travel down the watershed. Development within the watershed usually has an impact on both of these characteristics.

The objective of watershed master planning under Section 451.b (WMP) is to provide the community with a tool it can use to make decisions that will reduce the increased flooding from development on a watershed-wide basis. Most communities have some way of dealing with drainage problems, through a capital improvement plan, planned flood control structures, or perhaps just by responding to complaints as they arise. A watershed master plan, like other community plans, allows the community to consider future development as it works on current problems.

For CRS credit, development of a watershed master plan does not imply that a community must immediately address its future problems through capital drainage projects. It should be considered a tool to help the community identify opportunities to address problems before and as they arise.

The only way to completely understand how a watershed works, and how it will work as development proceeds, is to do a relatively detailed study of runoff under both present and future conditions. Doing the present-condition model allows the model to be calibrated to current experience. The community already knows where its problem areas are, and the model results should agree with this knowledge. Using information from future land use planning to modify the model will show the locations and magnitude of future problems. This is generally the first step in developing a watershed master plan. The present- and future-conditions hydrology and hydraulics are usually done using the U.S. Army Corps of Engineers’ HEC-1 model or something similar.

In addition to the present- and future-conditions hydrology studies, a watershed master plan should include mitigation recommendations that are appropriate for the community. These recommendations should include the entire range of mitigation activities—public information, structural control of runoff, non-structural programs (usually including stormwater management regulations), and acquisition of floodprone properties.

At a minimum for CRS credit, a watershed master plan must address the regulatory standards for new development. The modeling might show that different standards are needed for different watersheds, or for different parts of the watershed.

Other recommendations might be:

- To initiate a public information campaign to encourage property owners to adjust their landscaping to retain more runoff.
- To decide that all future capital improvements on streets and drainage systems will use the future-conditions hydrology. A 10% increase in the cost of a new culvert or bridge might bring huge future reductions in flood damage.
- To recommend a new revenue source to work on existing problems. Watershed-based drainage districts with taxing authority are becoming common in many areas of the country.

One of the prerequisites for CRS Class 4 (see Section 211.c) is that the community receive credit for watershed master planning based on the 100-year storm. Most communities use different storms for different design and management purposes. Development of a watershed master plan does not have to change that.

For example, a community might require that the 5-year storm be contained in storm sewers, the 10-year storm be contained in streets below the curb, the 25-year storm be at least 12 inches below the floors of new buildings, and the 100-year storm be below the floor elevations. If the community uses future-conditions hydrology to develop 5-, 10-, 25- and 100-year storms in the plan, it can use the results to effectively reduce future flood damage without revising the nominal requirements.

## 451 Credit Points

Maximum credit for Activity 450: 670 points.

a. Stormwater management regulations (SMR) (Maximum credit: 225 points)

SMR credit is provided if new developments are required to prevent or reduce the increase in runoff that results from urbanization of the watershed. To receive SMR credit, the watershed must be subject to a regulation that requires the peak runoff from new developments to be no greater than the runoff from the site in its pre-

development condition. Credit may be provided for other approaches to managing the impact of development on runoff where the community can show that there is no increase in flood damage downstream.

SMR credit is the sum of the credit for three sub-elements:

$$\text{SMR} = \text{SZ} + \text{DS} + \text{PUB.}$$

If  $\text{SZ} = 0$ , then  $\text{SMR} = 0$ .

1. Size of development (SZ) (Maximum credit: 25 points)

SZ is based upon the minimum size of areas regulated. Use either:

- (a) 25, if all development is regulated;
- (b) 20, if all development is regulated except for single-family residences, parcels of 1/2 acre or less, or increases in impervious area of 5,000 square feet or less;
- (c) 15, if all development is regulated except for parcels of 1/2 acre or less or increases in impervious area of 10,000 square feet or less; or
- (d) 5, if all development is regulated except for parcels of 5 acres or less or increases in impervious area of 20,000 square feet or less; or
- (e) 0, if the regulations only affect development of parcels larger than 5 acres or increases in impervious area of more than 20,000 square feet. If the regulations only cover such large development projects, there is no credit for SZ or SMR.

SZ provides different credit for different types of development. For example, if the community regulates commercial developments that are larger than 1 acre ( $\text{SZ} = 15$ ) and residential developments larger than 5 acres ( $\text{SZ} = 5$ ), an impact adjustment using Options 2 or 3 must be used to reflect the percentage of land use in each category. A similar adjustment must be made if the regulations do not apply to government agency developments.

If developments are exempt from regulation for some reason other than size, the community must relate this to one of the standards given. For example, the community could calculate the average size of such exempted developments over the last several years. The ISO/CRS Specialist should be contacted for assistance on this.

The CRS does not credit regulations that apply only to large developments (larger than 5 acres or more than 20,000 square feet of impervious surface) because the cumulative effect of a number of small, unregulated developments could have just as significant an impact on runoff in the watershed as a large development could.

Credit may be provided for requiring developers to pay fees in lieu of constructing facilities, if the fees collected go toward construction of the necessary facilities.

**Example 451.a-1.** As a condition of subdivision, planned unit development, or other permit approval, Watertown requires that all developments larger than 1 acre ensure that the post-development stormwater discharge will not exceed the amount of runoff under pre-development conditions.

SZ = 5

2. Design storms (DS) (Maximum credit: 90 points)

DS is the total of the following points based on the design storms used in the regulations (i.e., the storms used to measure the impact of new developments). For DS credit, the community's regulations must require pre- and post-development hydrology calculations and post-development runoff must be limited to pre-development levels. The standard used may be peak flow, volume, or a combination of the two.

- (a) 60, if detention/retention is designed for the 100-year storm;
- (b) 20, if detention/retention is designed for a storm larger than the 10-year but smaller than the 100-year storm; and
- (c) 10, if detention/retention is designed for a 10-year storm.

Although the 100-year flood is the basis for floodplain management, many communities use a lesser standard for stormwater management. A lower standard may meet many community needs, but management of smaller storms does not necessarily result in reduced peak flows or volume from a major storm.

The community must require management of at least a 10-year storm. A regulation designed to retain or detain only the "first flush," the first inch of rainfall, or less than a 10-year storm, is not credited under SMR. However, it may qualify as a water quality regulation (WQ) and be credited under Section 451.e.

DS credit of 90 points is provided if the regulation clearly states that all discharges UP TO AND INCLUDING the 100-year storm discharge must be released at rates not exceeding the pre-development peak discharge.



**Example 451.a-2.** Watertown's stormwater management ordinance used to require regulation of the 2- and 10-year storms to prevent increases in runoff. Under that ordinance, DS = 10. Similarly, if the ordinance had been based on the 25- and 50-year storms, DS would be 20.

Watertown's current ordinance requires determination of a proposed development's effects on the 10- and the 100-year storms to ensure that downstream peak flows are not increased.

$$DS = 10 + 60 = 70$$

**Example 451.a-3.** Gulf Beach County requires all new developments to retain the runoff from all storms up to and including the 100-year storm.

$$DS = 10 + 20 + 60 = 90$$

3. Public maintenance (PUB) (Maximum credit: 110 points)

Credit for PUB is provided if the community assumes maintenance responsibility for all new stormwater facilities or if the community inspects all new stormwater facilities at least annually and has regulatory authority to require the owners to perform appropriate maintenance.

PUB = 110, for public maintenance of all stormwater facilities.

Because experience has shown that private maintenance of stormwater management facilities is not as reliable in the long term, credit is provided to encourage maintenance by a public agency, or inspections by a public agency and maintenance as indicated by the inspections.

A community can receive PUB credit through any one or combination of three ways:

1. At least once each year, the community (or other stormwater management agency) inspects all stormwater management facilities constructed after the date of adoption of the regulation and orders maintenance when needed. If the owner fails to perform the maintenance, the community (or agency) does the job and bills the owner;
2. At least once each year, the owners of all stormwater management facilities constructed after the date of adoption of the regulation have the facilities inspected by a licensed professional engineer and perform the maintenance recommended by the

engineer. The owners must provide the engineer's inspection reports and documentation of the maintenance performed at least annually; or

3. All stormwater management facilities constructed after the date of adoption of the regulation (including basins built by private developers) are required to be deeded to the community (or other stormwater management agency), and the community (or agency) inspects the facilities at least annually and provides maintenance as needed.

Whichever approach is used, it must be supported by an ordinance or other regulatory authority. For example, holding the owner responsible for maintenance must be based on clear legal authority, such as the subdivision ordinance, that was known to the developer at the time of construction of the stormwater facility. Credit is not provided for a policy or a statement that the community has been able to get compliance in the past.

If inspection is performed by the community, the community must document its inspection program with all documentation required for channel debris removal (CDR) in Section 544.

**Example 451.a-4.** Watertown maintains all detention facilities in all developments:

$$\text{PUB} = 110$$

Watertown's other values were calculated above:  $\text{SZ} = 5$  and  $\text{DS} = 70$ .

$$\text{SMR} = \text{SZ} + \text{DS} + \text{PUB} = 5 + 70 + 110 = 185$$

b. Watershed master plan (WMP) (Maximum credit: 225 points)

1. Prerequisites:

- (a) The community must have adopted a watershed master plan for one or more of the watersheds that drain into the community.
- (b) The community has adopted regulatory standards for new construction in the watershed based on the plan.
- (c) The plan's regulatory standards manage future peak flows so that they do not increase over present values.
- (d) The plan's regulatory standards require management of runoff from all storms up to and including the 25-year event.

- (e) In order to maintain WMP credit for any plan that is more than five years old, the community must evaluate the plan to ensure that it remains applicable to current conditions. The evaluation must address whether the dates used for the plan are still appropriate and whether the plan effectively manages stormwater runoff. If a watershed master plan is obsolete, the community must update the plan or the WMP credit will be revised accordingly.
2. WMP = the total of the following points. Credit must be received for item (a).
- (a) 80, if the watershed master plan meets all of the prerequisites listed in Section 451.b.1.
  - (b) 25, if the plan manages the runoff from all storms up to and including the 100-year event.
  - (c) 40, if the plan provides management of future peak flows AND VOLUMES so that they do not increase over present values. If the community can demonstrate that its watershed plan prevents damaging increases in peak flows at all points within its watershed(s) and downstream, it will receive this credit.
  - (d) 25, if the plan manages the runoff from all storms up to and including the 5-day event. If a community can demonstrate that an event shorter than five days is the locally appropriate “worst-case” runoff event for stormwater management, it may receive the credit if it uses that event for its regulatory standard.
  - (e) 15, if the plan identifies existing wetlands or other natural open space areas to be preserved from development to provide natural attenuation, retention, or detention of runoff.
  - (f) 10, if the plan prohibits development, alteration, or modification of existing natural channels.
  - (g) 10, if the plan requires that channel improvement projects use natural or “soft” approaches rather than gabions, rip rap, concrete, or other “hard” techniques.
  - (h) 20, if the plan was prepared in coordination with or as a part of the community's floodplain management plan credited under Activity 510.

Credit is provided if the community develops and implements surface water runoff regulations through a watershed master plan that ensures that flood damage within and downstream from the watershed is not increased by future development. Eighty points are provided for the plan, provided that its standards:

- Have been adopted in the community’s regulatory program,
- Require that the peak flows of runoff from future development will not increase beyond the present peak flows, and

- Manage all storms up to and including the 25-year storm (no credit is provided for WMP for management of storms smaller than the 25-year storm).

Communities that receive 80 points for the watershed master plan can then receive additional points under subsections (b) through (h).

- (b) Twenty-five points are added if the community’s regulations manage all storms up to and including the 100-year storm. “All storms” includes specifically listed storms, such as the 2-, 10-, 25-, 50-, and 100-year storms.
- (c) Forty points are added if the plan’s regulatory standards prevent all increases in downstream flood peaks AND VOLUMES, regardless of the size of the watershed or its location within a larger basin. A community can receive the maximum credit if it detains runoff from a 25-year or larger storm and discharges it to groundwater or irrigation or if it detains the runoff long enough to discharge it after the peak flow in the receiving body has subsided so the discharge will not increase downstream peak flows anywhere in the receiving stream.

Communities that discharge directly into an ocean or a Great Lake may receive this credit if they have adopted a watershed master plan that models their watershed(s) and prevents increased peak flows within those watershed(s). Communities with watersheds that discharge into other large lakes or rivers must demonstrate that their discharges will not increase flood elevations in the lake or anywhere downstream on the receiving river.

- (d) Twenty-five additional points are provided for assuring that the most appropriate modeling techniques are used for the location. This is assumed to be a 5-day event unless the community can show that a shorter event is more appropriate for local conditions. In some areas this may require continuous-simulation modeling. If a community, regional, state, or federal agency can demonstrate that, say, the 72-hour event provides the “worst case” runoff for a watershed, the 72-hour event would be credited for communities in that area.
- (e)—(g) These additional points recognize communities that preserve their remaining “natural” channels, floodplains, or upland wetlands for stormwater conveyance or storage. “Soft” or “green” approaches are encouraged over “hard” or concrete measures.
- (h) The last 20 possible additional points are dependent on the community’s receiving credit for a floodplain management plan under Activity 510. A floodplain management plan developed for Activity 510 (Floodplain Management Planning) probably will not qualify for WMP credit, but a watershed master plan may qualify for credit under Activity 510. A community may be eligible for these 20 points if:
- The Floodplain Management Plan is mentioned prominently in the watershed master plan, and if references in the watershed master plan demonstrate that it is intended to help implement the Floodplain Management Plan; and/or

- Hydrologic output from the watershed master plan is used as input for the Floodplain Management Plan.

c. Freeboard for new buildings in B, C, D, and X Zones (FRX) (Maximum credit: 150 points)

FRX is determined by the type and amount of freeboard required in B, C, D, or X Zones (FX). FRX credit is not provided for a freeboard requirement above the base flood elevation. FRX credit is not provided to communities that are entirely Special Flood Hazard Area (SFHA). FRX = one of the following:

1. 50 x FX (the height in feet that the lowest floor (including basement) must be above the crown of the nearest street or the highest grade adjacent to the building); or
2. 25 x FX (the height in feet that the lowest opening or point of entry must be above the crown of the nearest street or the highest grade adjacent to the building); or
3. 50, if the regulations require that as a condition for a building permit, the applicant must prepare a site plan that accounts for local drainage from and onto adjoining properties and that protects the building from local drainage flows; or
4. 20, if the regulations require that the applicant provide positive drainage away from the building site.

FX is reduced by 0.5 feet if the standard is an elevation above the gutter rather than the crown of the street.

The FRX regulatory language is usually found in the building code, rather than in the ordinance with the floodplain or stormwater management regulations. Several of the national model codes require site plans or positive drainage.

Under items c.1. and 2., the maximum credit is provided for 3 feet of freeboard. The highest adjacent grade or other datum may be used as an alternative to the crown of the nearest street. If the street gutter is used, 0.5 feet is subtracted from the amount of freeboard.

There is no impact adjustment for FRX because it must be enforced throughout either the entire community or the B, C, D, and X Zones.

A community may request credit for FRX even if it does not apply for credit for the other elements of this activity.

**Example 451.c -1.** Watertown has adopted a version of the Uniform Building Code that requires the lowest floor to be at least 14" above the crown of the adjacent street.

$$FRX = 50 \times FX = 50 \times \frac{14"}{12"} = 50 \times 1.17 = 58.5$$

d. Erosion and sedimentation control regulations (ESC) (Maximum credit: 45 points)

ESC is based upon the areas regulated. ESC = one of the following:

1. 45, if regulations control erosion and soil loss from any disturbed land, including agricultural lands, greater than 1,000 square feet;
2. 35, if regulations control erosion and soil loss from construction sites as small as 1/2 acre;
3. 30, if regulations control erosion and soil loss from construction sites as small as 1 acre; or
4. 15, if regulations control erosion and soil loss only from construction sites greater than 5 acres.

This credit is provided because drainage systems cannot perform to their design standards if they are choked with sediment, a particular problem when the ground has been disturbed by development. This credit is for regulations that are applied throughout a community, not just in floodprone areas.

“All construction sites” in subsections d.2, 3, and 4 means all sites subject to construction of buildings, roads, etc., regrading, or other non-agricultural land-disturbing activity. An erosion and sedimentation control regulation that is part of a floodplain ordinance or a building code and does not affect ALL construction sites in the community does not receive full credit under this element.

A community may have regulations that exempt agricultural uses from erosion and sediment control requirements. For example, the state enabling legislation may not allow regulation of farms. In such cases, the community may apply for ESC = 45 if it can document that there are no agricultural zones and no existing agricultural uses within its corporate limits and all other projects (except those smaller than 1,000 square feet) are regulated.

**Example 451.d-1.** Appropriate ordinance language might read:

Prior to any grading or other earthwork that affects a land area larger than 500 square feet, the person performing such earthwork shall submit an erosion control plan. The plan shall be designed to prevent sediment from leaving the site during storms up to and including the 100-year storm and recover the ground after construction or other work to prevent or minimize erosion. [ESC = 45]

or

Application for any grading and/or building permit (except for single-family dwellings on existing platted lots) must include an erosion control plan designed to prevent sediment from leaving the site during the 100-year storm and recover the ground after construction to prevent or minimize erosion. [ESC = 35]

e. Water quality regulations (WQ) (Maximum credit: 25 points)

WQ = 25, if regulations require new developments of 5 acres or more to include in the design of their stormwater management facilities appropriate "best management practices" that will improve the quality of surface water.

Most states' environmental protection or pollution control offices have recommended best management practices (BMPs) appropriate for that state. Best management practices may include grass filter strips at retention basin inlets or outlets, velocity dissipators and baffles, basin dimensions that encourage settling of suspended solids, aeration, infiltration trenches, skimmers, vegetated swales, and other techniques that clean stormwater. It should be noted that this credit is not for BMPs required during the course of construction, but rather for measures that are permanently incorporated in the development's stormwater management facilities.

For WQ credit, the stormwater management regulations must either specify one or more measures or refer to best management practices as published in an official government reference. A mention of water quality or reduction of nonpoint sources of pollution in the purpose section of the regulations is not sufficient for credit.

**Example 451.e-1.** Watertown is located in a state-designated estuarine protection area. The plans for all new developments larger than 1 acre must be sent to the state coastal zone management agency for approval. The state regulations stipulate best management practices to improve the quality of the stormwater entering the estuary.

WQ = 25

## 452 Impact Adjustment

There are no impact adjustment ratios for FRX, ESC, or WQ because they must be enforced throughout the community. Credit for FRX is provided if the regulation applies only to areas outside the regulatory floodplain.

a. Option 1:

1. Stormwater management regulation (SMR): If the community, separately or along with upstream communities, regulates development within all of the watersheds that affect it,  $rSMR = 1.0$ .
2. Watershed master plan (WMP): If the watershed master plan regulates all development within all of the watersheds that affect the community,  $rWMP = 1.0$ .

A community may choose to exclude watersheds larger than 50 square miles. If such large watersheds are outside the community's jurisdiction, or are not regulated, the community will receive more credit by excluding them. If they are regulated, the community will receive more credit by including them.

The two "r" variables are used to reflect the ratio of the area covered by the community's basic regulations and the area covered by the community's watershed management plan. aWMP must be included in aSMR. If all regulated areas are included in the watershed plan,  $rWMP = 1.0$ .

Few communities will be able to use Option 1 to determine their impact adjustments because few communities have regulatory jurisdiction over areas that coincide with their watershed boundaries. The only cases that have arisen so far are:

- Communities that are islands,
- Communities subject to state or regional stormwater regulations that affect their entire watersheds, and
- Communities, usually counties, whose corporate boundaries are formed entirely by watershed divides (ridges), or bodies of water.

b. Option 2:

1. Stormwater management regulation (SMR): If the community does not regulate development within all of the watersheds that affect it, it may use the default value  $rSMR = 0.25$ .



2. Watershed master plan (WMP): If the watershed master plan does not regulate all development within all of the watersheds that affect the community, it may use the default value  $rWMP = 0.25$ .

Many communities find it difficult to determine the size of the watersheds. Therefore, 25% of the credit is given for cSMR if no rSMR is calculated. A community that regulates less than 25% of its watersheds may also use Option 2 to determine the minimum value of rSMR.

**Example 452.b-1.** Watertown regulates all watersheds within its corporate limits. However, areas outside the corporate limits are not regulated. Watertown uses Option 2:  $rSMR = 0.25$ .

c. Option 3:

1. Stormwater management regulation (SMR): If the community does not regulate development within all of the watersheds that affect it, it may develop a Stormwater Impact Adjustment Map to determine the areas required to calculate rSMR:

$$rSMR = \frac{aSMR}{aW}, \text{ where}$$

$aSMR$  = the area of stormwater management regulation, and

$aW$  = the area of all watersheds affecting the community.

2. Watershed master plan (WMP): If the watershed master plan does not include all areas of stormwater management regulation within the community, it may use the Stormwater Impact Adjustment Map to determine the areas required to calculate rWMP:

$$rWMP = \frac{aWMP}{aW}, \text{ where}$$

$aWMP$  = the area covered by a watershed master plan.

If a community can demonstrate that the upstream portion of its watershed is managed to a similar standard, either by other communities separately or by a regional entity like a drainage or flood control district,  $aSMR$  and  $aWMP$  may be

increased. The community must document such management in accordance with Section 454.

If a community can demonstrate that the upstream portion of its watershed is managed to a similar standard, either by other communities separately or by a regional entity like a drainage or flood control district, aSMR and aWMP may be increased. The community must document such management in accordance with Section 454.

Because this activity only affects watersheds under the jurisdiction of stormwater management regulations, impact adjustment ratios must be determined for stormwater management regulation and the watershed master plan.

In order to use Option 3 and determine aSMR, aW, and aWMP, the community must prepare a Stormwater Impact Adjustment Map. Although the purpose of this map is similar to the Impact Adjustment Map discussed in Section 403, it may be quite different in appearance. The base map for the Stormwater Impact Adjustment Map should be a small-scale map that can show all of the watersheds affecting the community. A community may choose to exclude watersheds larger than 50 square miles. If such large watersheds are outside the community's jurisdiction, or are not regulated, the community will receive more credit by excluding them. If they are regulated, the community will receive more credit by including them.

The entire watershed for each watercourse draining into or through the community should be shown on this map (except those with drainage areas over 50 square miles, if they are excluded from the calculations). The total area of these watersheds is aW. With appropriate documentation, aW may be reduced in two ways:

1. If upstream watersheds are effectively reduced by flood control structures that control the base flood, the size of aW is reduced accordingly.

*NOTE: Only structures designed to control the base flood can be used for this type of adjustment to aW.*

2. If portions of the watersheds are unlikely, because of their ownership, to be developed, those portions may be excluded from aW. Areas that might be excluded are national forests, state parks, or privately owned land dedicated to open space use.

Communities are encouraged to cooperate with adjacent communities to manage stormwater. If a community only has regulatory jurisdiction over a portion of its watersheds, it cannot ensure that properties will be safe from increased runoff in the future. However, if upstream communities also manage future development, either independently or through county-wide or watershed planning, all communities can benefit. Therefore, if a community can demonstrate that upstream communities have similar watershed management programs for the upper portions of their watersheds, it can include those areas in aSMR and aWMP.

Communities are encouraged to check with their state or regional stormwater management agency to see if they can apply for “uniform minimum credit,” i.e., credit based on the stormwater management program implemented by the regional agency.

### 453 Credit Calculation

- a.  $cSMR = SMR \times rSMR$
- b.  $cWMP = WMP \times rWMP$
- c.  $c450 = cSMR + cWMP + FRX + ESC + WQ$

**Example 453-1.** Watertown's credit points are discussed above:

$$SMR = 185, rSMR = 0.25, cSMR = 185 \times 0.25 = 46.25$$

$$FRX = 58.5$$

$$WQ = 25$$

$$c450 = 46.25 + 0 + 58.5 + 25 = 129.75, \text{ which is rounded to } 130$$

During the field verification, the ISO/CRS Specialist examined a selection of public and privately owned facilities and they appeared to be properly maintained.

### 454 Credit Documentation

The community must submit the following:

- a. [Required if the community is applying for credit for SMR under Section 451.a]: A copy of the ordinance or law language regulating surface water runoff from new developments in the watershed. For SMR credit, the language must require that peak runoff from new developments be no greater than the runoff from the site in its pre-development condition. The margin next to where this appears in the ordinance must be marked “SMR.”

The language submitted must include those factors that are credited: size of developments regulated, design storms to be used, and how the maintenance of drainage and retention facilities is handled. The appropriate acronym(s) (SZ, DS, and PUB) must be marked in the margin of the ordinance sections that pertain to each element.

The community may also be asked to complete an activity worksheet that helps identify where the credits are due.

As an alternative to such a performance standard, the language may be based on criteria designed to produce the same result on a regional basis (e.g., a standard allowable discharge per acre based on a regional study). If such language is used, the community must provide an estimate of the design storm controlled and a comparison of the pre-development runoff and the permitted discharge.

For CRS credit, the regulations must be legally enforceable. Policies and guidelines are not acceptable unless the community's legal counsel states that they are enforceable.

A photocopy of the appropriate pages of the ordinance(s) (e.g., subdivision and/or zoning ordinances) or statute, including the cover page to identify the document, is sufficient and should be attached to the activity worksheets. The Chief Executive Officer's (CEO's) certification is considered to include a certification that the ordinance or statute has been enacted into law and is being enforced (see Section 212.a).

**Example 454.a-1.** Sample ordinance language might read:

All new development within the Little River watershed shall be designed to prevent any increase in peak flow, velocity, or total runoff volume during the 5-year and 100-year rainfall events. Prior to development, the developer must submit hydrologic and hydraulic studies showing the nature and extent of runoff under present conditions and with the proposed development for those two rainfall events.

- b. [Required if the community is applying for WMP credit under Section 451.b] Copies of the pages of the watershed master plan that show the following:
1. Management of peak flows and volumes so that they do not exceed present values. The plan must include either regulations that meet these criteria, or must be based on a rainfall/runoff model that achieves these results;
  2. The recurrence interval of the storm used for the regulations and/or model;
  3. The duration of the storm used for the regulations and/or model;
  4. [Required if the community is applying for credit for Section 451.b.2(e)—(g)] How the plan utilizes or protects the existing natural stormwater features within the watershed; and

5. [Required if the community is applying for credit for Section 451.b.2(h)] A statement by the community official responsible for implementation of the watershed master plan that it was prepared in coordination with or as part of the community's Floodplain Management Plan credited under Activity 510. This documentation may be provided from either plan if it is contained there.

The community may also be asked to complete an activity worksheet that helps identify where the credits are due.

A watershed management plan is usually a complex, bulky document. It may have an introduction or summary describing the area covered by the plan, its objectives, and the regulation of surface water runoff. This summary is probably adequate documentation for some or all of this credit. If no such summary is available, it must be developed to document this credit.

There are three ways for the community to document its credit for WMP:

- Mark the appropriate sections of the plan with the section numbers in Section 451.b (451.b.1(b), 452.b.2(c), etc.);
- Write a memo listing the credits requested and giving the pages and sections where the language can be found; or
- Complete the activity worksheet that identifies where the credits are found.

c. [Required if the community is applying for FRX credit under Section 451.c] A copy of the ordinance or law language that requires elevation of the lowest floor or lowest opening of new buildings. The acronym FRX must be marked in the margin of the section that pertains to this element.

This documentation may be in the community's building code. If the community has adopted one of the national model building codes, documentation of that adoption, as well as the code language, must be provided.

d. [Required if the community is applying for ESC credit under Section 451.d] The ordinance or law language that requires developers or property owners to use techniques that prevent erosion and soil loss from exposed land. The ordinance(s) or law must designate an office or official responsible for receiving complaints and monitoring compliance and it must include enforcement and abatement provisions.

The acronym ESC must be marked in the margin of the ordinance section that pertains to this element.

e. [Required if the community is applying for WQ credit under Section 451.e] The ordinance or law language that requires new developments to implement appropriate best management practices to improve water quality.

The acronym WQ must be marked in the margin of the ordinance section that pertains to this element.

A copy of the appropriate pages of the ordinance or statute is sufficient. The CEO's certification is considered to include a certification that the ordinance or statute has been enacted into law and is being enforced (see Section 212.a).

f. [Required if the community calculates the impact adjustment ratio for one or more elements by using Option 1 (Section 452.a) or Option 3 (Section 452.c)] An Impact Adjustment Map showing watershed boundaries and stormwater management jurisdiction.

The Impact Adjustment Map is explained in the *Commentary* text following Section 452.c. If either Option 1 or 3 is used, the map is needed to verify the impact adjustment calculations.

g. [Required if the community determines the area of stormwater management regulation (aSMR) or the area covered by the watershed master plan (aWMP) to include watershed areas regulated by other communities] Documentation that watersheds outside the jurisdiction of the community are regulated to similar standards or are subject to the same plan as those within the community.

The applicant can provide the actual ordinance language from the community(ies) or written assurance from a county, regional, or state agency that similar standards are in effect in the upstream communities.

h. [Required if the community is applying for PUB credit under Section 451.a.3] The procedures used to inspect and maintain drainage facilities.

The inspection and maintenance procedures for this activity must include the same five items needed for Activity 540's drainage system maintenance as specified in Section 544.a. It is recommended that the stormwater management facility maintenance procedures be part of the drainage system maintenance program because Activities 450 and 540 are closely related.

The community must have the following documentation available to verify implementation of this activity:

- i. Development and building permit records that demonstrate enforcement of the regulations. If the community applied for credit for public maintenance under Section 451.a.3, records that demonstrate implementation of the inspection and maintenance requirements.

If it has received credit for a watershed master plan (WMP) under Section 451.b, the community must provide the following documentation at the time of its cycle verification:

- j. An evaluation report that addresses whether the community's watershed master plans that are more than five years old are still based on appropriate data and effectively manage stormwater runoff. In lieu of a formal report, the community may submit a letter signed by a licensed professional engineer that addresses the following issues:
  - (1) The "future conditions" at the time the plan was completed: Do these conditions still reasonably reflect the actual watershed conditions today?
  - (2) The precipitation data used for the plan's hydrology: Does the community or agency still use the same precipitation that was used in the report?
  - (3) Method used for the plan(s): Is the method used to develop the plan(s) considered appropriate today by the agency?
  - (4) Construction: Has construction of stormwater infrastructure altered actual conditions in ways that make the plan(s) obsolete?
  - (5) Other factors: Are there other aspects of the plan(s) that make it obsolete or otherwise of questionable applicability?

## 455 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. See Appendix E to order a free copy of *CRS Credit for Stormwater Management*.
- b. Rural communities can request help on this activity from the U.S. Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.

- c. Most states' environmental protection or pollution control offices have recommended best management practices (BMPs) appropriate for that state. The U.S. Environmental Protection Agency has developed BMPs for coastal areas that are appropriate throughout the country.

*Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, 840-B-92-002, January 1993, can be obtained from

U.S. Environmental Protection Agency  
Office of Water  
Washington, D.C. 20460



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## 510 FLOODPLAIN MANAGEMENT PLANNING

### Summary of Section 510

Credit is provided for preparing, adopting, implementing, evaluating, and updating a comprehensive floodplain management plan or repetitive loss area analyses. The Community Rating System (CRS) does not specify what must be in a plan, but it only credits plans that have been prepared and kept updated according to the standard planning process explained in Section 511. Credit is also provided for implementing a habitat conservation plan.

**511 Credit Points.** Up to 359 points are provided for three elements.

- a. Up to 294 points are provided for adopting and implementing a floodplain management plan (FMP) that was developed using the following standard planning process. There must be some credit for each of the 10 planning steps.

<u>Step</u>	<u>Max points</u>
1. Organize to prepare the plan	10
2. Involve the public	85
3. Coordinate with other agencies	25
4. Assess the hazard	20
5. Assess the problem	35
6. Set goals	2
7. Review possible activities	30
8. Draft an action plan	70
9. Adopt the plan	2
10. Implement, evaluate, and revise	15

- b. Up to 50 points are provided for conducting repetitive loss area analyses (RLAA).
- c. Up to 15 points are provided for adopting and implementing a Habitat Conservation Plan (HCP).

### 512 Impact Adjustment.

- a. Under Option 1, if the floodplain management plan covers all of the community's known flood hazard areas, the impact adjustment ratio is 1.0. If the repetitive loss area analyses cover all repetitive loss areas, the impact adjustment ratio is 1.0. A Category C repetitive loss community must use Option 1 if it is preparing a plan or analysis to meet the CRS participation prerequisite specified in Section 502.
- b. Under Option 2, if the floodplain management plan or repetitive loss area analyses cover some of the community's hazard areas, the impact adjustment ratio is 0.25. A Category C repetitive loss community must use Option 1.
- c. Under Option 3, the impact adjustment ratios reflect the proportion of the community's repetitive loss areas that are covered by area analyses.

**513 Credit Calculation.** The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

**514 Credit Documentation.** The community must submit the following.

- a. The activity worksheet or plan review crosswalk.
- b. A copy of the floodplain management plan with the credited elements noted in the margin or explained in an attached memo.
- c. Documentation showing how the public was involved in preparing or reviewing the plan.
- d. Copies of materials that document coordination with other municipalities, agencies, and organizations credited under Section 511.a.3(b)-(f).
- e. Documentation showing that the plan has been adopted by the community's governing body and/or the habitat conservation plan was accepted by the appropriate agency.
- f. A copy of each repetitive loss area analysis.

The community must submit the following with its annual CRS recertification.

- g. An annual evaluation report on progress toward implementing the recommendations.
- h. An update to the plan, prepared at least every five years.

**515 For More Information.** A free CRS publication, *Example Plans*, provides more information and examples for this activity.

## 510 FLOODPLAIN MANAGEMENT PLANNING

**Background:** Programs that are based on a comprehensive floodplain management or hazard mitigation plan address all the community's flood problems more effectively.

**NOTE:** A separate publication, *Example Plans*, has a detailed discussion of the requirements of this section and of multi-hazard mitigation plans, as well as model plans and application documentation. Communities are encouraged to obtain and read this document before applying for this activity. It will improve the quality of the submittal and reduce the need to provide additional documentation later. To order a free copy, see Appendix E.

The objective of floodplain management or hazard mitigation planning is to produce a program of activities that will best tackle the community's vulnerability to the hazard(s) and meet other community needs. A well-prepared plan will:

- Ensure that a comprehensive review of possible activities and mitigation measures is conducted so that the most appropriate solutions are used to address the hazard.
- Ensure that the recommended activities meet the goals and objectives of the community, do not create conflicts with other activities, and are coordinated to reduce the costs of implementing individual activities.
- Educate residents about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains.
- Build public and political support for projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.
- Build a constituency that wants to see the plan's recommendations implemented.

**Activity Description:** Credit is provided for preparing, adopting, implementing, evaluating, and updating a comprehensive floodplain management plan. The Department of Homeland Security's Federal Emergency Management Agency (FEMA) also requires a multi-hazard mitigation plan as a prerequisite for mitigation funding. The CRS and FEMA do not specify what activities a plan must recommend, but they only recognize plans that have been prepared according to the standard planning process explained in FEMA regulations and Section 511 of this activity.

An area analysis focuses on reducing damage to repetitively flooded buildings. It has a narrower scope than a plan, and receives fewer credit points. A Category C repetitive loss community must prepare either a floodplain management plan or area analyses that cover at least all of its repetitive loss areas. A community can receive credit for both efforts, but they must be published as separate documents.

Action: Report recommended ordinance language to the City Council by March 2006.

Budget: staff time (operating funds).

4. The City Engineer will draft a comprehensive stormwater management plan for the ditch draining the southeast part of town to identify the best locations for stormwater facilities and set retention standards for new developments.

Action: Complete the first draft by September 2006.

Budget: staff time (operating funds).

5. The City Engineer will prepare a cost estimate for enlarging the culvert under the railroad tracks to accommodate the base flood. The estimate will include a study of the impact of increased flows on downstream properties, channel banks, and habitat.

Action: Complete the study by January 2006.

Budget: staff time (operating funds).

#### **Phase IV – Plan Maintenance**

9. Adopt the plan (Maximum credit: 2 points) The 2 credit points for this step are provided if the plan and later amendments are officially adopted by the community's governing body. (REQUIRED)

When a multi-jurisdictional plan is prepared, it must be adopted by the governing board of each community seeking CRS or multi-hazard mitigation plan credit.

The plan must be an official plan of the community, not an internal staff proposal. Regional plans are not adequate unless they specifically address the community's natural hazards and the community's governing body adopted the plan.

#### **Phase IV – Plan Maintenance**

10. Implement, evaluate, and revise (Maximum credit: 15 points) The credit for this step is the total of the following points based on how the community monitors and evaluates its plan.

- (a) 2, if the community has procedures for monitoring implementation, reviewing progress, and recommending revisions to the plan in an annual evaluation report. The report must be submitted to the governing body, released to the media and made available to the public. (REQUIRED)

(b) 13, if the evaluation report that is credited in step 2(a) is prepared by the same planning committee that prepared the plan or by a successor committee with a similar membership that was created to replace the planning committee and charged with monitoring and evaluating implementation of the plan.

To maintain this credit, the community must submit a copy of its annual evaluation report with its recertification each year and update the plan at least every five years.

To be useful, planning must be dynamic. The plan should not sit on a shelf gathering dust once it is completed. Therefore, the community must have an evaluation and update process.

No plan is perfect. As implementation proceeds, flaws will be discovered and changes will be needed. Not only can hazard conditions change but also goals and objectives may change. If a community is hit by a tornado, the planning may be changed to focus attention on the newly damaged areas in the SFHA. Many communities have periodic meetings of the planning committee to review progress to date and recommend changes to the projects for the next year.

The plan must describe the how, when, and by whom the plan will be monitored. Monitoring may include periodic reports by agencies involved in implementing projects or activities, site visits, phone calls, and meetings conducted by the person responsible for overseeing the plan. The plan must also include a description of how, when, and by whom the plan will be evaluated, and should include the criteria used to evaluate the plan.

Those involved in developing and implementing the plan should meet periodically to review progress toward the objectives and identify changes or revisions that should be made. This is usually done monthly or quarterly, but must be done at least annually to facilitate preparation of the annual evaluation report.

FAILURE TO SUBMIT THE EVALUATION REPORT WITH THE ANNUAL RECERTIFICATION WILL RESULT IN LOSS OF THE PLANNING CREDIT (I.E., FMP = 0). LOSS OF CREDIT FOR THIS ACTIVITY WILL CAUSE A REPETITIVE LOSS CATEGORY C COMMUNITY TO REVERT TO A CLASS 10.

Changes should be made in the action plan when opportunities arise to add new activities or complete some items ahead of schedule. The plan should also be revised if it is found that some activities cannot be completed on the original timetable. The revisions must be adopted by the governing body as required under step 9.

b. Repetitive loss area analysis (RLAA)

Up to 50 points are provided for conducting area analyses of all of the community's repetitive loss areas. An area analysis is prepared according to the following criteria:

## 514 Credit Documentation

If the community already has a floodplain management, hazard mitigation, or similar plan that meets the 10-step credit criteria, it need not prepare a new plan just for this CRS credit.

The community must submit the following:

- a. The activity worksheet or plan review crosswalk that identifies the page or section number where each credited item is located in the floodplain management or hazard mitigation plan.
- b. A copy of the floodplain management or hazard mitigation plan. At the time of cycle verification, this section applies to the five-year update to the previously credited plan. A description of the process used to develop (or update) the plan must be included, either as part of the plan or attached to it. While some of the steps can be explained in a separate memo, the following must appear in the plan document:
  - Step 1. a description of the plan preparation process,
  - Step 4. the hazard assessment,
  - Step 5. the problem assessment,
  - Step 6. goals of the floodplain management or hazard mitigation program,
  - Step 7. the review of possible activities,
  - Step 8. the action plan, and
  - Step 10. how the plan will be periodically evaluated and revised.
- c. Documentation showing how the public was involved in preparing or reviewing the plan, including a list of the members of the planning committee and their affiliations and a copy of the notice(s) advising residents about the public meeting(s) held pursuant to step 2(b) and (c), and a record of the meeting(s).
- d. Copies of correspondence, meeting notes, or other materials that document the coordination with other municipalities, agencies, and organizations credited under Sections 511.a3(b)—(f).

The notice of the public input meeting(s) should be in the form of letters to floodplain residents, a notice sent to all residents, or a newspaper article or advertisement. An inconspicuous legal notice in the classified section of the newspaper will not be sufficient for CRS credit. If very few residents are affected, as may be the case for planning that addresses

only a repetitive loss area, a written record that the residents were called would be sufficient documentation.

A record of the meeting is also needed. This could be the minutes of the public meeting, a memo for the record, or a list of the issues raised by those who attended.

- e. Documentation showing that the floodplain management plan (or the five-year update) and/or the Habitat Conservation Plan have been adopted by the community's governing body. When a multi-jurisdictional plan is prepared, it must be adopted by the governing board of each community seeking CRS credit. If the community is applying for credit for a Habitat Conservation Plan that has been accepted by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, the documentation must include a written record of that acceptance.

Normally a plan is adopted by a formal resolution of the city council, county board, or other governing body. A copy of the resolution or a copy of the minutes for the meeting are appropriate documentation to show that the plan was officially adopted.

- f. A copy of each repetitive loss area analysis to be credited and a memo or other documentation showing that the head of the appropriate department has approved it. The National Flood Mitigation Data Collection Tool database file must also be provided, if requested.

The community must submit the following documentation with its annual CRS recertification (see Section 214):

- g. An annual report on evaluating progress toward implementing the action plan's objectives and/or the recommendations of the area analyses. A single report may be prepared for all area analyses. The evaluation report must be submitted to the governing body, released to the media, made available to the public, and included as part of the community's annual recertification. The report must include the following:
1. A description of how the evaluation report was prepared and how it is submitted to the governing body, released to the media, and made available to the public.
  2. How the reader can obtain a copy of the original plan or area analysis report;
  3. A review of each recommendation or action item in the action plan or area analysis report, including a statement on how much was accomplished during the previous year;
  4. A discussion of why any objectives were not reached or why implementation is behind schedule; and
  5. Recommendations for new projects or revised recommendations.

The submittal must include other documentation to demonstrate that the evaluation report was submitted to the governing body, released to the media, made available to the public and/or prepared by the same planning committee that prepared the plan.

If the community fails to submit an annual progress report with its recertification, there is no credit (FMP = 0 and RLAA = 0). Without continued credit, a category C repetitive loss community will revert to a Class 10.

The objective of the annual evaluation report and the five-year plan update is to ensure that there is a continuing and responsive planning process. It is required for the community to continue to receive the credit for its floodplain management planning. Continued credit for floodplain management planning is dependent on the report's being submitted with the community's annual CRS recertification.

The review of each recommendation in the action plan or area analysis report must state how much was accomplished during the previous year. Where possible, the objectives and progress toward them should be measurable (e.g., "five of the six lots slated for acquisition were purchased" or "we improved one mile of stream channel"). Where a recommendation or action item is not scheduled to be addressed during the year, it should still be listed and so noted (e.g., "scheduled for 2007").

If appropriate, new projects or revised objectives may be established. For example, if fewer people requested technical advice than expected, the next year's plan might have a smaller target number. If the original plan's projects or objectives are changed, the evaluation report or a plan amendment must be adopted by the governing body. If an area analysis' recommendations are changed, the change must be approved by the appropriate department head.

**Example 514.f-1.** Floodville's staff prepares the annual evaluation report by March 1 each year. This is added to the City Manager's March report to the City Council, which is copied to the local media, the Chamber of Commerce, and three neighborhood organizations that helped prepare the plan. Members of the public may review copies in City Hall.

FAILURE TO SUBMIT THE FLOODPLAIN MANAGEMENT PLAN'S EVALUATION REPORT WITH THE ANNUAL RECERTIFICATION OR THE FIVE-YEAR UPDATE AT THE FOLLOWING CYCLE VERIFICATION WILL RESULT IN LOSS OF THE PLANNING CREDIT (I.E., FMP = 0). FAILURE TO SUBMIT THE AREA ANALYSIS' EVALUATION REPORT WITH THE ANNUAL RECERTIFICATION WILL RESULT IN LOSS OF THE CREDIT (I.E., RLAA = 0). LOSS OF CREDIT FOR THIS ACTIVITY WILL CAUSE A REPETITIVE LOSS CATEGORY C COMMUNITY TO REVERT TO A CLASS 10.



h. An update to the plan, prepared at least every five years. If it has been more than five years since the plan was adopted, an update will be required at the time the community applies for the credit. The five-year plan update will be scored according to the *Coordinator's Manual* currently in effect, not the version used when the community originally applied. The update must include the following steps:

1. Steps 1 and 2: If the original planning process included a committee, then in order to keep the credit provided under step 1, item (b) or step 2, item (a), the update must be conducted by a committee that meets the criteria identified in those steps.
2. Step 2: If the original planning process received credit for the final public meeting credited under step 2, item (c), then in order to keep this credit the community must also conduct a public meeting that reviews and receives comments on the draft update.
3. Step 3, item (a): The update must include a review of new studies, reports, and technical information and of the community's needs, goals, and plans for the area that have been published since the plan was prepared.
4. Steps 4 and 5: The hazard and problem assessments must be reviewed and brought up to date. The assessments must account for:
  - new floodplain or hazard mapping,
  - annexation of floodprone areas,
  - additional repetitive loss properties,
  - increased development in the floodplain or watershed,
  - new flood control projects,
  - lack of maintenance of flood control projects,
  - major floods or other disasters that occurred since the plan was adopted, and
  - any other change in flooding conditions and/or development exposed to flooding or the other hazards covered in the plan.
5. Step 8: The action plan must be revised to account for projects that have been completed, dropped, or changed and for changes in the hazard and problem assessments, as appropriate.
6. Step 9: The update must be adopted by the community's governing board.

An annual evaluation that includes these steps may qualify as the five-year update.

If the community fails to submit the five-year update by October 1 of the year following its next cycle verification, there is no planning credit (FMP = 0). Without continued credit under this activity, a category C repetitive loss community will revert to a Class 10.

## 515 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. See Appendix E to order a free copy of *Example Plans*. It is also on the CRS website, <http://training.fema.gov/EMIWeb/CRS/>.
- b. HAZUS-MH is a risk assessment software program that is described in Figure 510-1. Copies are available free from FEMA. Users need to be familiar with operating GIS software. Training is also available. More information is available at <http://www.fema.gov/hazus/index.shtm>.
- c. The National Flood Mitigation Data Collection Tool gathers information related to risk, building construction, and costs in order to help make decisions about what mitigation measures are appropriate for a floodprone property. The Tool is in Microsoft Access format and is available free to any public agency. Copies of the software can be obtained from the CRS at [NFIPCRS@ISO.com](mailto:NFIPCRS@ISO.com) or 317-848-2898.
- d. Contact state or regional planning, water resources, natural resources, environmental protection, or NFIP coordinating agencies for information on state and federal agencies that can assist in preparing a floodplain management plan.
- e. The following publications discuss the planning process and the variety of measures that should be examined. They are available free from

FEMA Distribution Center  
P.O. Box 2010  
Jessup, MD 20794-2012  
800-480-2520  
Fax: 301-362-5335

FEMA has a series of “how-to guides” on planning, to help communities meet the multi-hazard mitigation planning criteria. They can be found at

<http://www.fema.gov/fima/resources.shtm>.

- *Getting Started: Building Support for Mitigation Planning* (FEMA 386-1) covers planning Phase I and CRS planning steps 1–3.
- *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA 386-2) covers planning Phase II and CRS planning steps 4–5.
- *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies* (FEMA 386-3) covers planning Phase III and CRS planning steps 6–8.
- *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4) covers planning Phase IV and CRS planning steps 9–10.
- *Integrating Manmade Hazards into Mitigation Planning* (FEMA 386-7).

*Reducing Damage from Localized Flooding: A Guide for Communities*, FEMA 511, 2005. Also available at <http://www.fema.gov/hazards/floods/flood-damage-toc.shtm>.

*Development of Cost Effective Mitigation Measures for Floodprone Structures*, FEMA, 2005.

*Planning for Post Disaster Recovery and Reconstruction*, American Planning Association (APA) Planning Advisory Service, 346 pages, APA Report # 483/484, FEMA 421, 1998.

*Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability*, 43 pages, FEMA 364, 2000. Also available for downloading at <http://www.fema.gov/fima/linkmitliv.shtm>.

*Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials*, FEMA-116, 1987.

“Mitigation Benefit Cost (BCA) Toolkit Compact Disc.” This CD includes all the FEMA BCA software, technical manuals, BCA training course documentation, and other supporting material and BCA guidance. Copies can be obtained by calling FEMA’s toll-free BC Hotline at 1-866-222-3580.

- f. Rural communities can request help on this activity from the Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.
- g. The U.S. Army Corps of Engineers can also provide technical information and advice to communities interested in preparing a comprehensive floodplain management plan. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps. Corps offices can be found at <http://www.usace.army.mil/where.html#Divisions>.
- h. The Rivers and Trails Conservation Assistance Program of the National Park Service provides planning assistance to communities interested in setting flood protection goals and identifying nonstructural options. The Park Service provides experienced staff to help communities focus on the grass-roots involvement of residents when developing a plan. For more information, contact:

National Park Service  
Center for Recreation and Conservation  
1849 C St., N.W.  
Washington, D.C. 20240-0001  
(202) 565-1200

- i. The following publications can also be of assistance. They can be ordered from their publisher by calling the number noted.

*A Multi-Objective Planning Process for Mitigating Natural Hazards*, FEMA and the National Park Service, 1995, (303) 235-4830 or (303) 969-2850.

*Flood Proofing: How to Evaluate Your Options*, U.S. Army Corps of Engineers, 1994.

- j. More information on Habitat Conservation Plans can be found in *Habitat Conservation Planning Handbook*, U.S. Fish and Wildlife Service and National Marine Fisheries Service, November 1996. See Appendix F for the appropriate office of the Fish and Wildlife Service.
- k. The Association of State Floodplain Managers has prepared a floodplain management planning kit. It consists of reference materials, masters for handouts, and a two-part video that explains the 10-step process to the general public and is meant to be shown at the first meeting of a planning committee. Order *Flood Mitigation Planning—The First Steps* through the ASFPM website, <http://www.floods.org> or call (608) 274-0123, \$12.

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## 530 FLOOD PROTECTION

### Summary of Activity 530

**531 Credit Points.** Up to 2,800 points are provided. However, there is a maximum of 1,000 points for structural flood control projects and 200 for sewer backup protection projects.

- a. Prerequisites: Projects must protect to at least the 25-year flood level, in some cases be designed by an engineer, and meet other requirements specific to the type of project.
- b. Retrofitting technique used (TU): The points for TU are based on the effectiveness of:
  - Elevation,
  - Dry floodproofing,
  - Wet floodproofing, and
  - Protection from sewer backup.
- c. Flood control technique used (TU): The points for TU are based on the effectiveness of:
  - Barriers,
  - Channel modifications, including enlarging bridges and culverts,
  - Diversions,
  - Storm sewer improvements, and
  - Reservoirs and other storage basins that meet state dam safety requirements.
- d. Flood protection improvement (FPI): The points are adjusted based on the difference between the flood protection provided before and after the project.
- e. The values for TU and FPI for each building are multiplied and totaled to produce the score for protected buildings (PB)
- f. Protected buildings on the FEMA repetitive loss list are counted twice toward PB.
- g. Protected buildings in the floodplain that are critical facilities are counted twice toward PB.

**532 Impact Adjustment.** The credit points are adjusted in one of two ways.

- a. Under Option 1, the community receives 4.2 points for each protected building.
- b. Under Option 2, PB is divided by the number of buildings in the Special Flood Hazard Area.

**533 Credit Calculation.** The impact adjustment ratio is multiplied by 28.

**534 Credit Documentation.** The community must have the following available to verify implementation of this activity.

- a. Documentation that demonstrates that each project meets the prerequisites as described in Section 531.a.
- b. Documentation for each protected building, appropriate to the flood protection technique used.
- c. A map showing the location of all protected buildings for which credit is being requested.
- d. [If the community is using Option 2] Calculations showing the number of buildings in the SFHA.
- e. [If credit is being requested for buildings outside the SFHA] Documentation that shows that floodplain regulations are in effect in the area outside the SFHA.

**535 For More Information.**

## 530 FLOOD PROTECTION

Credit is provided for protecting buildings from flood damage through either of two methods:

- Retrofitting the buildings so that they suffer no or minimal damage when flooded.
- Constructing small flood control projects that keep flood waters from reaching the buildings or lower the level of flood waters.

**Background:** The 300 series of activities provides credit for encouraging retrofitting and other flood protection measures. This activity provides credit when properties are actually protected.

Acquisition and relocation of floodprone buildings is the preferred method of flood damage reduction. However, many buildings can be protected on-site, especially from shallow, slow-moving flood waters. This activity provides credits for those buildings left in the floodplain that have been protected from flood damage by retrofitting or certain types of flood control structures.

**Activity Description:** The credit is based on the number of insurable buildings in the area of regulated floodplain that have been retrofitted since the date of the community's original Flood Insurance Rate Map (FIRM). For the purposes of this activity, an accessory structure such as a garage or shed is not counted as an insurable building. Extra credit is given for protecting buildings on the repetitive loss list of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) (see Section 501).

Flood protection techniques that are recognized by this activity include:

Retrofitting projects:

- Elevating buildings above flood levels,
- Dry floodproofing,
- Wet floodproofing, and
- Protecting basements from sewer backup.

Structural flood control projects:

- Barriers, including levees, berms, and floodwalls;
- Channel modifications, including enlarging bridges and culverts;
- Diversions;
- Storm sewer improvements, including enclosing open channels; and
- Small reservoirs, including retention and detention basins.

The following techniques are NOT credited under this activity:

1. Projects that protect to less than the 25-year flood level;
2. Coastal structural projects, including seawalls, groins, and beach nourishment;

2. For buildings protected by a channel modification project, including diversions, enlarging bridges and culverts, and storm sewer improvements, a licensed professional engineer must certify that no buildings are located in areas that would be impacted by any increases in flood elevations caused by the project.

TU = 0.8, if the project design provides at least one foot of clearance between the flood protection level and bridge decks, top of pipe, and other obstructions.

TU = 0.7, in all other cases.

3. For buildings protected by a reservoir, detention basin, retention pond, or other flood water storage facility

TU = 0.8

If the flood water is stored behind a dam or other above-ground containment structure, then the community must document that the structure meets all state dam safety requirements. If the state does not have a dam safety program, then a licensed professional engineer must certify that the structure meets the U.S. Army Corps of Engineers' dam safety criteria.

d. Flood protection improvement (FPI)

FPI<sub>i</sub> = the improved flood protection that the project provides for building i

1. For buildings that have been elevated so they meet the NFIP requirements for new construction:

FPI<sub>i</sub> = 1.0, if the building (and its utilities, duct work, etc.) have been elevated to one foot or more above the base flood elevation.

FPI<sub>i</sub> = 0.9, if the building (and its utilities, duct work, etc.) have been elevated to or above the base flood elevation.

2. The credit for all other flood protection measures is adjusted for the flood protection improvement provided to each building:

FPI<sub>i</sub> = FPP<sub>i</sub> – FPB<sub>i</sub>, where

FPI<sub>i</sub> = flood protection improvement for building i

FPP = flood protection provided by the project

FPB = flood protection level before the project was constructed.

3. The values for FPP and FPB are:

0.0 for protection to less than the 10-year flood

0.3 for protection to the 10-year flood, but less than the 25-year flood

0.5 for protection to the 25-year flood, but less than the 50-year flood

0.8 for protection to the 50-year flood, but less than the 100-year flood

0.9 for protection to the 100-year flood

1.0 for protection to the 100-year flood plus one foot or more

1.0 for protection to the 500-year flood



4. The minimum value for FPP is 0.5. There is no credit for flood protection measures that protect to less than the 25-year flood level.
5. The flood protection level of a barrier is the top of the barrier.
6. If a basement is protected from sewer backup by an overhead sewer or backup valve, then FPP = 1.0

If a structural flood control project modifies the 100-year floodplain, the community is obligated to notify FEMA of the changes (44 *CFR* 65.3).

### Example 531-1.

Example 1: A building on a crawlspace was elevated from the 10-year flood elevation to one foot above 100-year flood elevation.

$$FPI = 1.0$$

Example 2: A building has been protected by a 25-year berm (changing its protection level from 0 to the 25-year flood level).

$$FPP = 0.5, FPB = 0, FPI = FPP - FPB = 0.5 - 0 = 0.5$$

Example 3: A channel improvement lowers the 100-year flood by 2 feet. Instead of having the 50-year flood go over the lowest floor, buildings are now dry during the 100-year flood. For these buildings:

$$FPP = 0.9, FPB = 0.8,$$

$$FPI = FPP - FPB = 0.9 - 0.8 = 0.1$$

Example 4: Another building closer to the stream is affected by the same channel improvement. The two-foot drop in flood levels means that this building is now subject only to the 60-year flood instead of the 35-year flood.

$$FPP = 0.8, FPB = 0.5, FPI = FPP - FPB = 0.8 - 0.5 = 0.3$$

#### d. Protected buildings

$PB = \sum(TU_i \times FPI_i)$ . That is, PB, the variable for protected buildings, is the sum of the TU value for each building times the FPI value for that building. The maximum value for  $(TU_i \times FPI_i)$  for any single building is 1.0 (i.e., the building was elevated  $(TU_i = 1.0)$  and it was elevated to one foot above the base flood level  $(FPI_i = 1.0)$ ).

Summing the factors for each building is shown in the formula with the mathematical symbol “ $\Sigma$ ” (sigma). The calculations are easier to understand and compute in the activity worksheets.

*NOTE: See Section 505 on projects funded by FEMA's Flood Mitigation Assistance program.*

- e. If a protected building in the regulatory floodplain is also on the FEMA repetitive loss list, it is counted twice toward PB. If a protected building outside of the regulatory floodplain is also on the FEMA repetitive loss list, it is counted once toward PB.

If a protected building is a Severe Repetitive Loss Property and in the regulatory floodplain, it is counted three times toward PB. If a protected building outside of the regulatory floodplain is also a Severe Repetitive Loss Property, it is counted twice toward PB. These multipliers are provided only if the flood protection measure was sufficient to remove the property from the repetitive loss list.

Section 501 explains the FEMA repetitive loss list. It is a list of properties that have received repetitive flood insurance claims. Communities with one or more properties on the list review the list as a prerequisite to entering the CRS.

Figure 500-1 explains Severe Repetitive Loss Properties, a subset of the repetitive loss properties that includes those that have been particularly hard hit by repetitive flooding and are prime candidates for flood protection. Additional credit is provided for each Severe Repetitive Loss Property that has been protected. For example, if five floodplain properties on the repetitive loss list were elevated and one was a Severe Repetitive Loss Property, then they would be counted as  $(4 \times 2) + (1 \times 3) = 11$  buildings counted toward PB.

If a repetitive loss property in the regulatory floodplain, it is simply listed twice on the activity worksheet, AW-530-2, and noted as "repetitive loss." If it is not in the community's regulatory floodplain, it is listed once. The same approach is used for Severe Repetitive Loss Properties, except that if one is in the regulatory floodplain, it is listed three times (twice if it is outside the floodplain).

No separate documentation is needed for this extra repetitive loss credit. It is verified by a review of the community's corrected repetitive loss list and field verified with the other buildings credited for PB. A community with no properties on the FEMA repetitive loss list is not eligible for this extra credit.

**Example 531-2.** A review of Floodville's building permits identified 5 retrofitted buildings. They are listed by address and numbered on AW-530-2. Buildings 1–4 are in or near Area #1 in Figure 500-1. Because Area #1 is subject to ice jams, it is a high hazard area. The retrofitting projects were all designed by a licensed engineer.

Buildings 1 and 2 were elevated several years ago. The buildings were subject to damage by the 10-year flood until they were raised above the level of an earlier flood, which was about a 50-year event. (The projects were not substantial improvements, so there was no code requirement to go to the 100-year flood level).

$$TU_{1-2} = 1.0$$

$$FPP_{1-2} = 0.8, FPB_{1-2} = 0$$

$$FPI_{1-2} = FPP_{1-2} - FPB_{1-2} = 0.8 - 0 = 0.8$$

$$TU_{1-2} \times FPI_{1-2} = 1.0 \times 0.8 = 0.8$$

Buildings 3 and 4 were elevated after the last flood. They were not as low as buildings 1 and 2. It is estimated that they were at a 10–20-year flood level. The City used FEMA Hazard Mitigation Grant funds to encourage voluntary retrofitting. Buildings 3 and 4 were elevated 2 feet above the base flood level.

$$TU_{3-4} = 1.0$$

$$FPI_{3-4} = 1.0$$

$$TU_{3-4} \times FPI_{3-4} = 1.0 \times 1.0 = 1.0$$

Building 1 and Building 3 are on FEMA’s repetitive loss list, so they are listed twice on AW-530-2.

Buildings 5–14 are in or near Area #2. Although Area #2 is outside the SFHA, it is subject to Floodville’s floodplain regulations. Buildings in this floodplain are therefore eligible for credit under this activity. The area flooded an average of every 5 years, so the buildings are considered to have been protected to less than the 10-year flood level

Buildings 5–14 benefited from a culvert enlargement. The City had surveyed each building in this area. The channel and the culvert can now handle the 25-year flood without its reaching these buildings. The other buildings in this floodplain, closer to the channel, are still subject to flooding by the 25-year flood.

$$TU_{5-14} = 0.7$$

$$FPP_{5-14} = 0.5, FPB_{5-14} = 0$$

$$FPI_{5-14} = FPP_{5-14} - FPB_{5-14} = 0.5 - 0 = 0.5$$

$$TU_{5-14} \times FPI_{5-14} = 0.7 \times 0.5 = 0.35$$

Buildings 8, 13 and 14 are on FEMA’s repetitive loss list, so they are listed twice on AW-530-2.

The calculations are done on AW-530-2. PB = 9.95.

f. If a protected building in the regulatory floodplain is also a critical facility, it is counted twice toward PB. If a protected building outside of the regulatory floodplain is also a critical facility, it is counted once toward PB.

For CRS credit purposes, critical facilities are defined in Section 130. This section provides a bonus for protecting structures such as emergency operations centers, hospitals, and buildings where hazardous materials are stored. Like repetitive loss buildings, buildings that are critical facilities are scored twice.

## 532 Impact Adjustment

### a. Option 1:

$rPB = 0.15 \times$  the number of buildings protected using one or more of the techniques described in Section 531.b or c. The projects must meet all of the prerequisites in Section 531, including protecting to at least the 25-year flood level. A maximum of 20 different properties can be counted toward Option 1. This can be any combination of properties in the regulatory floodplain, repetitive loss buildings, and Severe Repetitive Loss Properties.

If the community uses Option 1, it will receive 4.2 points for each protected building. The maximum value under Option 1 is limited to the scores for 20 different properties. For example, the community may count 14 buildings removed from the regulatory floodplain, 5 repetitive loss properties, and 1 Severe Repetitive Loss Property. Using the repetitive loss multipliers in Section 531.e, these 20 properties equate to  $14 + (5 \times 2) + (1 \times 3) = 27$  protected buildings.  $rPB = 0.15 \times 27 = 4.05$ .

The community does not need to complete activity worksheet AW-530-2, nor does its application specify the addresses or the values for TU and FPI for the protected buildings. However, the community must still have this information available for the credited buildings during the verification visit and it must be able to show that the retrofitting or structural flood control projects meet all of the relevant prerequisites.

### b. Option 2:

$bSF =$  the number of buildings in the SFHA, as described in Section 303.

$rPB = \frac{100 \times PB}{bSF}$ .  $rPB$  cannot be greater than 100.0.

The credit points for this activity are based on the ratio of the protected buildings' points ( $rPB$ ) to the number of buildings in the SFHA. This is done by dividing the points for protected buildings ( $PB$ ) by the number of buildings in the SFHA ( $bSF$ ).  $bSF$  is the same variable used in Activities 520, 610, and 620, and is described in more detail in Sections 302–303. Even if the community is requesting credit for buildings outside the SFHA, the impact adjustment is based on  $bSF$ , the number of buildings in the SFHA.

It is theoretically possible that there are more protected buildings than buildings in the SFHA and that the number of retrofitted buildings could be greater than bSF. However, rPB cannot be greater than 100.0. Note that buildings not on FEMA’s repetitive loss list that are outside of the SFHA can only be counted toward PB if they are in an area subject to floodplain regulations (aRF) as shown on the community’s Impact Adjustment Map (see Section 403).

**Example 532.b-1.** Someburg has protected ten buildings from the 50-year flood with a channel improvement, has two buildings elevated above the 100-year flood level, and has constructed a barrier around the public works garage to protect it from the 25-year flood. Someburg has 13 buildings that are protected by techniques that meet the criteria of Section 531.b or c. The Someburg building official has permit records for each project. None of the projects requires human intervention, nor are the buildings located in a high hazard area.

Under Option 1,  $rPB = 0.15 \times 13 = 1.95$

**Example 532.b-2.** As noted in the previous section, Floodville’s PB score is 9.95. As noted in Section 522, there are 282 buildings in Floodville’s SFHA: bSF = 282.

Under Option 2,  $rPB = \frac{100 \times 9.95}{282} = \frac{995}{282} = 3.53$

### 533 Credit Calculation

$$c530 = 28 \times rPB$$

**Example 533-1.** Someburg uses Option 1 for the impact adjustment:

$$rPB = 1.95$$

$$c530 = 28 \times 1.95 = 54.6, \text{ rounded to } 55$$

**Example 533-2.** Floodville receives more credit points using Option 2. As discussed above, rPB for Floodville is 3.53.

$$c530 = 28 \times 3.53 = 98.84, \text{ rounded to } 99$$

**Example 533-3.** Bigtown constructs a series of flood control reservoirs and detention basins to reduce flood levels on Swampy Creek. Some wetlands are preserved and some more are created to act as natural retention areas. There are

## 610 FLOOD WARNING PROGRAM

### Summary of Activity 610

**611 Credit Points.** There are five elements in this activity for a maximum of 255 points.

- a. Flood threat recognition system (FTR): Up to 40 points are provided for a flood threat recognition system that forecasts flood elevations and arrival times at specific locations within the community.
- b. Emergency warning dissemination (EWD): Up to 60 points are provided for disseminating the warning to the general public.
- c. Other response efforts (ORE): Up to 50 points are provided for implementation of specific tasks to reduce or prevent threats to health, safety, and property.
- d. Critical facilities planning (CFP): Up to 50 points are provided for coordination of flood warning and response activities with operators of critical facilities.
- e. StormReady community (SRC): If FTR credit is received, 25 or 30 points are provided for designation by the National Weather Service as a StormReady community or a TsunamiReady community.

The community must receive credit for FTR to receive any credit under this activity and it must receive credit for EWD to receive credit for ORE or CFP.

**612 Impact Adjustment.** The credit points for each element (except SRC) are adjusted in one of three ways.

- a. Under Option 1, if the program is implemented throughout the Special Flood Hazard Area (SFHA), the impact adjustment ratio for an element is 1.0.
- b. Under Option 2, if the program is not implemented throughout the SFHA, a default impact adjustment ratio of 0.25 may be used.
- c. Under Option 3, if the program is not implemented throughout the SFHA, the impact adjustment ratios may reflect the number of buildings in the SFHA affected.

**613 Credit Calculation.** The credit points for each element are multiplied by the impact adjustment ratios and their products are totaled.

**614 Credit Documentation.** The community must submit the following.

- a. A description of the flood threat recognition system that tells how site-specific forecasts with flood elevations or flood flows and arrival times are generated by meteorologic and/or hydrologic data.
- b. [Required only if applying for EWD, ORE, or CFP credit under Sections 611.b through d]:
  1. Documentation of adoption of the flood response plan.
  2. Applicable portions of the plan or other documents.
  3. A copy of the materials that publicize the flood warning system.
- c. [Required if the impact adjustment ratios used Options 1 or 3 (Section 612.a or 612.c)] Documentation showing how the impact adjustments were determined. If Option 3 is used, a map showing the areas covered by the flood warning program.

The community must submit the following with its annual recertification:

- d. [Required if applying for credit for other response efforts (ORE)] A description of the drill, exercise, or actual emergency or disaster response during the past year.
  - e. [Required if applying for credit for critical facilities planning (CFP1)] A page from the list of operators of the facilities affected by flooding, updated at least annually
- If the community experienced a flood during the year, it must submit with its annual recertification:
- f. An evaluation report on the flood warning program's performance.

**615 For More Information.**

## 610 FLOOD WARNING PROGRAM

*NOTE: A separate publication, **CRS Credit for Flood Warning Programs**, gives an example of a community program and application documentation. Communities are encouraged to read this document before applying for this activity. It will improve the quality of the application and reduce the need for additional documentation later. For a free copy, see Appendix E.*

Credit is provided for a program that provides timely identification of impending flood threats, disseminates warnings to appropriate floodplain occupants, and coordinates flood response activities.

**Background:** With sufficient warning of a flood, a community and its floodplain occupants can take protective measures such as moving furniture, cars, and people out of harm's way. When a flood threat recognition system is combined with an emergency response plan that addresses the community's flood problems, a great deal of flood damage can often be prevented.

The National Weather Service issues specific flood warnings for specific locations along major rivers and coastlines. There is a small but growing number of communities with their own flood threat recognition systems, which enable advance identification of floods on smaller rivers. The full benefit of early flood warning is only realized if the community disseminates the warning to the general public and to critical facilities. Additional flood damage can be prevented if the community has a flood response plan that includes appropriate tasks, such as directing evacuation, sandbagging, and moving building contents above flood levels.

**Activity Description:** The community must have a flood threat recognition system that identifies an impending flood in order to receive credit under this activity. Additional credit is provided for disseminating a warning to the general public, carrying out appropriate flood response tasks, and coordinating the flood response plan with operators of critical facilities. A report on the operation of the system is required if a flood meeting the criteria in Section 614.d occurred during the previous year.

This activity is not intended to be a model for developing a flood warning or flood response program. As with the rest of the Community Rating System (CRS) activities, its objective is to provide a simple way to measure a local program's potential impact on flood insurance premiums. An effective flood warning or response program needs to be carefully prepared and tailored to the local flood hazards and the specific needs of the community.

The minimum requirement for credit for this activity is a flood threat recognition system to identify impending flooding. The system can use locally collected data or data from the National Weather Service or other rain, river, or storm monitoring agency.

Even where a multi-hazard plan or other comprehensive emergency response plan is used for parts of the documentation, other documentation may be required. Many of the specific items required to document these elements may be in appendices or standard operating procedures rather than in the body of the plan.

If a multi-hazard emergency response plan or comprehensive emergency management plan with many annexes is used to document the credit for this activity, the entire document should not be submitted with the CRS application. The specific documentation should be marked with the CRS acronyms in the margins, and copies of only those pages should be submitted.

3. A copy of the materials that publicize the warning system. The publicity must fully cover the topics of flood warning and flood safety as discussed in Section 331. The materials must be distributed each year and must reach at least 90% of the target audience.
- c. [If the community determines the impact adjustment ratios using Options 1 or 3 (Section 612.a or 612.c)] Documentation showing how the impact adjustments were determined. If Option 3 is used, a map showing the areas covered by the flood warning program is needed.

If Option 1 is used, a written statement that all buildings in the SFHA are covered by the program is sufficient.

The community must submit the following with its annual CRS recertification:

- d. [If the community has credit for other response efforts (ORE)] A description of the exercise, drill, or response to an actual emergency or disaster conducted during the previous year. The description must include a list of who participated and any lessons learned from the exercise, drill, emergency, or disaster.
- e. [If the community has credit for critical facilities planning (CFP1)] A page from the list of the operators of the critical facilities affected by flooding that must be updated at least annually (see Sections 214 and 611.d.2(a)).
- f. If the community experienced at least one flood during the previous year that damaged more than 10 buildings, caused more than \$50,000 in property damage, or caused the death of one or more persons, it must submit the following documentation with its annual CRS recertification (see Section 214):

An evaluation report that describes the performance of the warning program. For each flood meeting the above criteria, this report must describe how the program operated in response to the flood, and any improvements that may be needed.

If there has been a flood that meets the above criteria, submission of the report with the annual recertification is necessary for continued credit under this activity. The report should include a discussion of the following items. The report does not need to cover items 3 through 5 if the community is not receiving CRS credit for these elements.



1. The cause of the flood and its estimated recurrence interval, if known;
2. Performance of the flood threat recognition system;
3. Dissemination of warnings and public response;
4. Governmental and private response activities, such as evacuation or flood fighting;
5. Impact of the flood on critical facilities;
6. Description of deaths, injuries, property damage, and impact on public health and safety;
7. Damage prevented by the flood warning system and response plan;
8. Lessons learned and changes needed in the warning program and response plan; and
9. The status of implementing the changes recommended by the last post-flood evaluation report.

If the evaluation identifies shortcomings in the flood warning system or failures in its operation, the report must identify remedial actions that will improve future operation.

## 615 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

- a. The following publications are available at no cost (see Appendix E).

*CRS Credit for Flood Warning Systems*

*CRS Credit for Management of Coastal Erosion Hazards*

*CRS Credit for Management of Tsunami Hazards.*

- b. In most cases, communities can receive assistance from their state emergency services agency or the National Weather Service in establishing warning programs and planning and conducting drills.
- c. Most district offices of the U.S. Army Corps of Engineers have handbooks on flood emergency procedures and offer help in developing flood response plans.
- d. Copies of the following publications are available at no cost from

FEMA Distribution Center  
P.O. Box 2010  
Jessup, MD 20794-2012  
1-800-480-2520  
Fax: (301) 362-5335

*Disaster Operations, A Handbook for Local Governments*, FEMA, CPG 1-6, 1981.

*Preparing for Hurricanes and Coastal Flooding: A Handbook for Local Officials*, FEMA and the Office of Ocean and Coastal Resource Management, FEMA-50, 1983.

*State and Local Guide (SLG) 101: Guide for All-Hazard Emergency Operations Planning*. September 1996 (available from <http://www.fema.gov/pdf/rrr/0-prelim.pdf>).

e. FEMA has independent study courses from the Emergency Management Institute through its website. See <http://training.fema.gov/EMIWeb/>.

f. The following may be ordered from

National Technical Information Service (NTIS)  
U.S. Department of Commerce  
Springfield, VA 22161

*Guidelines on Community Local Flood Warning and Response Systems*, Federal Interagency Advisory Committee on Water Data, 1985. (NTIS order number PB 86 109 717, \$21.95).

*Community Handbook on Flood Warning and Preparedness Programs*, H. James Owen, for the U.S. Army Corps of Engineers, 1981. (NTIS order number AD-A108 669, \$15.95).

g. More information on StormReady can be obtained from the local National Weather Service office or the NOAA website at <http://www.nws.noaa.gov/stormready/>.

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## 620 LEVEE SAFETY

### Summary of Activity 620

**621 Credit Points.** There is one element in this activity for a maximum of 900 points.

- a. Levee protection level (LPL): Up to 100 points are provided based on the flood recurrence interval at the flood protection level. The levee's flood protection level is 3 feet below the lowest point of the crown. The following conditions must be met:
- b. The levee must have been constructed before January 1, 1991.
- c. The community must have a levee emergency plan that specifies actions to be taken at various flood stages.
- d. Each year the community must notify properties protected by the levee of the residual flood hazard.

**622 Impact Adjustment.** The credit points for each element are adjusted in one of three ways.

- a. Under Option 1, if all of the buildings in the Special Flood Hazard Area (SFHA) are protected by the levee, the impact adjustment ratio is 1.0.
- b. Under Option 2, if there are at least five buildings protected by the levee, a default impact adjustment ratio of 0.01 may be used and the community receives 9 points for this activity.
- c. Under Option 3, the impact adjustment ratio reflects the number of buildings in the SFHA protected by the levee.

**623 Credit Calculation.** The credit points for LPL are multiplied by the impact adjustment ratio and then by 9.

**624 Credit Documentation.** The community must submit the following.

- a. Levee protection level documentation. EITHER:
  1. A statement signed by the U.S. Army Corps of Engineers that states the levee protection level and the date of construction, OR
  2. A certification by a licensed professional engineer that states that the levee meets all of the NFIP levee recognition requirements except for height and show date of construction, the levee protection level, and that interior mechanized drainage systems have been tested.
- b. The community's levee emergency response plan specifying actions to take at various flood stages.
- c. The map showing the area protected by the levee.
- d. Documentation showing how the impact adjustment ratios were determined.

The community must submit the following documentation with its annual recertification.

- e. A certification by a licensed professional engineer that the levee has been maintained in such a manner that it meets all the NFIP levee maintenance requirements and that mechanized interior drainage systems have been tested.
- f. Documentation of the monthly communications checks between the agency responsible for the levee and local officials and a description of the levee emergency plan exercise, drill, or response to an emergency or disaster during the previous year.
- g. A copy of the materials that notify occupants of the area protected by the credited levee.

**625 For More Information.**

## 620 LEVEE SAFETY

Credit is provided for maintaining levees and a levee emergency response plan for areas protected by less than base flood levees.

**Background:** If a levee or floodwall does not meet the base flood protection criteria, it is not recognized on the Flood Insurance Rate Map (FIRM). Because these levees do prevent damage from smaller, more frequent floods, they may receive CRS credit.

Many communities are protected to some extent by levees or floodwalls. (As used in this activity, the word “levee” includes floodwalls.) The National Flood Insurance Program (NFIP) has criteria (44 *CFR* 65.10, shown in Figure 620-2a–c) for recognizing whether a levee provides protection from the base flood. If it does, the protected area is mapped as a B, C, or X Zone and flood insurance rates are lower than if it remained an A Zone. The community is required to maintain the levee to its design standard in order to keep the favorable zone designation.

**Activity Description:** This activity provides credit to communities protected by levees that are properly maintained and operated but are not high enough to meet the criteria for base flood levees. A community may also receive credit for a levee that protects to the base flood elevation or above if the levee is not reflected on the community’s FIRM. There is no credit under this activity if the area protected by the levee is designated as an AO, A99, AR, B, C, or X Zone or an AE or A numbered zone with the base flood elevation lower than on the water side of the levee.

CRS credit is only provided for levees and floodwalls built before January 1, 1991, and those that provide protection to at least the 25-year flood elevation. SEE THE NOTE IN SECTION 621.

In addition to having adequate design and maintenance, there must be emergency response plans for situations in which the levees are threatened with overtopping or failure.

This activity is not intended to encourage construction of new flood control structures or to duplicate credit given to base flood levees by current mapping procedures.

The area protected by a levee on a community’s FIRM must show the protected area as an SFHA. The base flood elevation must be the same on both sides of the levee. If the area protected by a levee is mapped as a B, C, or X Zone, the levee was considered to provide base flood protection when the FIRM was prepared and no credit is available under this activity.

There are other activities related to levees that are not included here because they are credited elsewhere. For example, Activity 330 (Outreach Projects) could provide credit for advising residents of the protected area about the levee and its shortcomings.

## 621 Credit Points

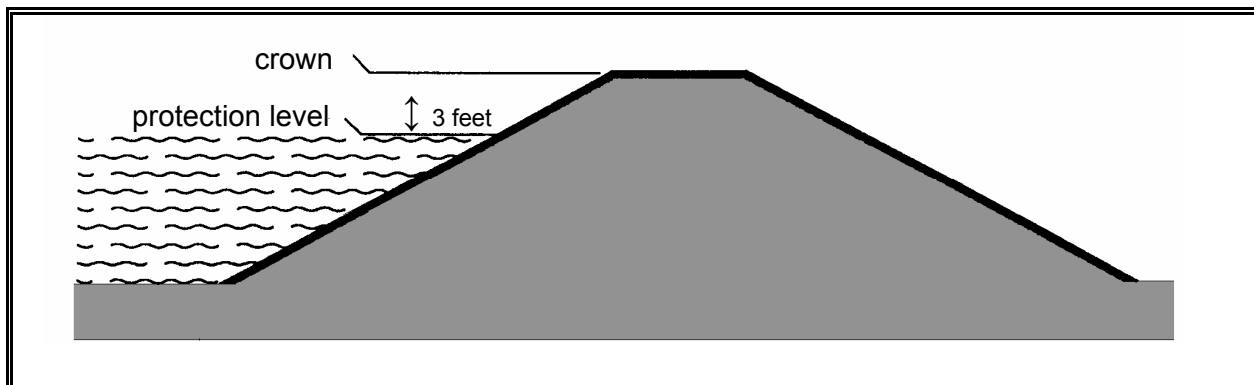
Maximum credit for Activity 620: 900 points.

Levee protection level (LPL) (Maximum credit: 100 points)

For LPL credit, the following conditions must be met:

- a. LPL = flood recurrence interval at the flood protection level. If the flood protection level is at or above the base flood elevation, LPL = 100. There is no credit for levees below the 25-year protection level. The flood protection level can be determined in either of the following ways:
  1. The levee's flood protection level may be determined by the U.S. Army Corps of Engineers or other federal agency that has inspected the levee; or
  2. In the absence of a determination by a federal agency with jurisdiction, the levee's flood protection level is 3 feet below the lowest point of the crown.

The criteria in 44 *CFR* 65.10(b)(1) require that the crown of the levee be at least 3 feet above the base flood elevation. To be credited under this activity, the levee would not need to be that high, but it must meet the rest of the requirements of §65.10.



**Figure 620-1. Levee protection level.**

In the absence of a statement from the Corps or other federal agency with jurisdiction, the protection elevation of the levee is considered to be 3 feet below the crown of the levee (see Figure 620-1). For example, if the levee's crown is 3 feet above the 50-year flood level, LPL = 50. In 44 *CFR* 65.10(b)(1), there is a discussion of the circumstances under which a smaller freeboard is acceptable.

The recurrence interval for the protection elevation can be determined from the flood insurance study's profile. In any case, the flood protection elevation must be provided by the community.

**Example 621.a-1.** The elevation of the crown of Riverview's levee is 532 feet NGVD. Three feet below the crown is elevation 529. A check of the profile shows that 529 is halfway between the 50- and 100-year flood elevations. Therefore, LPL = 75.

To be eligible for credit under this activity, the levee must provide protection from at least a 25-year flood. Base flood levees may already be credited under the NFIP because areas in the floodplain that are protected by them are usually mapped B, C, or X Zones and flood insurance premium rates are substantially lower than those for unprotected floodplain properties.

**Example 621.a-2.** The elevation of 3 feet below the crown of Floodville's levee approximates the 10-year flood elevation on the profile. Therefore, LPL = 0 and there is no credit for this activity. Floodville may review the freeboard criteria in 44 CFR 65.10(b)(1) to see if the Department of Homeland Security's Federal Emergency Management Agency (FEMA) would accept 2 feet of freeboard.

***NOTE:** The area protected by the levee may be mapped as an A, AE, or numbered A Zone to reflect internal drainage problems. If it is an AO Zone, it definitely reflects internal drainage problems. Where the SFHA is based on an internal drainage problem, the protected area has a base flood elevation lower than the river's and the levee has been mapped as providing protection from the base flood. This activity does not provide credit for levees in these cases. If the area protected by the levee is later remapped as an X, A99, AR, or AO Zone or other SFHA that only reflects internal drainage, the community will lose its CRS credit for this activity. Remapping the floodplain due to a flood protection project provides a separate and greater flood insurance premium rate reduction (see Section 530).*

It is important to note that operation and maintenance "must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP." A levee maintained by a levee district is acceptable; one maintained by a homeowner's association is not.

- |   |
|---|
| <ul style="list-style-type: none"><li>b. The levee must have been constructed before January 1, 1991.</li><li>c. The community must have a levee emergency plan that specifies actions to be taken at various flood stages. Actions that must be included are:<ul style="list-style-type: none"><li>1. Periodic patrols of the structure;</li></ul></li></ul> |
|---|

2. Closing openings that are structural parts of the system (sandbagging is not acceptable);
3. Warning local emergency officials when the flood reaches within 4 feet of the crown of the levee;
4. Monthly communications checks with local emergency officials;
5. Annual inspections of emergency equipment and stockpiles; and
6. Annual drills.

The NFIP rules in 44 *CFR* 65.10(c), Operation plans and criteria, specify what needs to be done to protect the levee from failure. For example, the standards for allowable closures are found in 65.10(c)(1).

Items c.1 through c.6 specify what needs to be done to protect lives and property in the protected area if the levee fails or is overtopped. Acting when a flood is within 4 feet of the crown allows time to advise local officials that the levee protection is being threatened. A different threshold for advance notice of failure or overtopping may be submitted for review.

If the community requests credit for a flood response plan under Activity 610 (Flood Warning Program), items 1, 2, and 3 should be incorporated into that plan. Items 4, 5, and 6 should be coordinated with the maintenance, testing, and drills of the community's flood response plan. However, the emergency plan for the levee must be designed and implemented by the agency that operates and maintains the levee, which may or may not be the community.

- d. Each year, the community must notify properties protected by the levee of the residual flood hazard. The annual project must meet the credit criteria for an outreach project to floodplain properties (OPF) credited under Section 331.b. The notice must clearly explain that the property is subject to flooding from a flood that exceeds the levee protection level or that results from a levee failure.

## 622 Impact Adjustment

- a. Option 1:

If all of the buildings in the community's SFHA are protected by a single levee or a levee system built to a single flood protection level, rLP = 1.0.



b. Option 2:  
 $rLP = 0.01$ , where  $bLP \geq 5$  and  $bLP$  = the number of buildings protected by the levee.

c. Option 3:  
 $rLP = \frac{bLP}{bSF}$ , where  $bLP$  = the number of buildings protected by the levee.  
 $bSF$  = the number of buildings in the SFHA.

If the levee protects all of the buildings in the SFHA, the impact adjustment ratio  $rLP = 1.0$  (Option 1).

If at least five buildings are protected by the levee (i.e.,  $bLP = 5$  or more), then a default impact adjustment ratio of 0.01 may be used. If the community has fewer than 500 buildings in its SFHA (i.e.,  $bSF < 500$ ), it will receive more credit points by using Option 3. If the levee protects more than 1% of the buildings in the SFHA, it will receive more credit points under Option 3. However, Option 2 may still be used if the community does not want to calculate  $bSF$ .

Otherwise,  $rLP$  is calculated by dividing the number of buildings that the levee protects ( $bLP$ ) by the number of buildings in the SFHA ( $bSF$ ) (Option 3). There is no credit for protecting buildings not in the SFHA as shown on the FIRM.

A discussion of impact adjustment ratios using buildings, including the variable  $bSF$ , appears in Sections 301 through 303.

**Example 622.b-1.** Riverview’s levee protects 82 buildings in the SFHA:  $bLP = 82$ . There are 150 buildings in Riverview’s SFHA:  $bSF = 150$ . Using Option 3,

$$rLP = \frac{82}{150} = 0.55$$

### 623 Credit Calculation

$$c620 = 9 \times LPL \times rLP$$

**Example 623-1.** Riverview's levee protects 82 buildings to approximately the 75-year flood level: LPL = 75. As noted above, rLP = 0.55.

$$c620 = 9 \times 75 \times 0.55 = 371.25 = 371$$

## 624 Credit Documentation

The community must submit the following documentation with its application:

a. EITHER:

1. A statement signed by the U.S. Army Corps of Engineers or other federal agency with jurisdiction that has inspected the levee that
  - (a) States the levee protection level; and
  - (b) Provides the date of construction; OR
2. A certification by a licensed professional engineer that
  - (a) States that the levee or floodwall meets all the NFIP levee recognition requirements (44 *CFR* 65.10) except for height (65.10(b)(1));
  - (b) Provides the date of construction; and
  - (c) Provides the protection elevation and the flood recurrence interval for that elevation. Data sources and calculations must be included.

The levee must be certified by a licensed professional engineer as meeting all of the NFIP's requirements for levee recognition as iterated in 44 *CFR* 65.10. These requirements are reprinted in Figure 620-2 and cover the levee design, operation, and maintenance in subsections (b), (c), and (d), respectively.

- b. A copy of the community's levee emergency plan meeting the specifications of Section 621.c.
- c. A copy of the officially adopted levee maintenance plan meeting the specifications of 44 *CFR* 65.10(d).
- d. A map showing the area the levee protects, designated as "LP." No credit is provided for levees that protect vacant land or properties in B, C, or X Zones.

The credit points for this activity are adjusted in Section 622 according to the number of buildings protected (bLP). To assist in calculating and verifying the number of buildings protected, the area protected by the levee must be shown on a map.

The map may be the community's FIRM or the Impact Adjustment Map prepared in accordance with the instructions in Section 403. The data for the map can be found in the original design study for the levee. As an alternative, bLP can be the buildings in the area below the flood protection elevation as extrapolated from the best available contour map.

e. [If the community determines the impact adjustment ratios using Options 2 or 3 (Section 622.b or 622.c)] Documentation showing how bLP was determined. If the community used Option 3, documentation showing how bSF was determined.

The variable bSF represents the number of buildings in the SFHA. It is discussed in detail in Sections 302 and 303.

The community must submit the following documentation with its annual CRS recertification (see Section 214):

f. A certification by a licensed professional engineer that the levee has been maintained in accordance with the officially adopted levee maintenance plan and that all mechanized interior drainage systems have been tested.

As an alternative to certification, the community may use a copy of the Corps' annual inspection report, provided that it shows that the levee has been maintained and received an "acceptable" rating, or a letter from the Corps that states that the levee has been maintained in accordance with the officially adopted levee maintenance plan.

g. Documentation of the monthly communications checks between the agency responsible for the levee and local emergency officials and a description of the exercise or drill of the levee emergency plan or the response to an actual emergency or disaster conducted during the previous year. The description must include a list of who participated and any lessons learned from the exercise, drill, emergency, or disaster.

h. A copy of the materials that notify occupants of the area protected by the credited levee. The materials must be distributed each year and must reach at least 90% of the properties in the protected area. An outreach project to floodplain properties credited under Activity 330 (Outreach Projects) may qualify for this credit provided that it clearly notifies the recipients that they are exposed to a levee failure flood hazard.

The following may be cause for loss of credit under this activity:

- Failure to properly maintain the levee;
- Failure to conduct the monthly checks and annual inspections and drills;
- Failure to distribute the annual notification to the occupants of the area protected by the credited levee; or
- Failure to submit the appropriate documentation each year.

Many levees have been funded or partially funded by the Corps of Engineers or other federal or state agencies. To ensure that their investment is being properly maintained, these agencies often conduct inspections and send inspection results to the levee owner (e.g., the levee district). Copies of these results suffice as documentation that the levee is being maintained but not necessarily that the checks, inspections, and drills have been conducted.

## **625 For More Information**

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

a. The following document is available at no cost from

U.S. Army Corps of Engineers, ATTN: CECW-PF  
20 Massachusetts Avenue, N.W.  
Washington, D.C. 20314

*Design and Construction of Levees*, U.S. Army Corps of Engineers, Office of the Chief of Engineers, Engineering Manual 1110-2-1913, 1978.

b. See the documents listed for Activity 610 (Flood Warning Program) in Section 615.

c. Rural communities can request help on this activity from the Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.

**44 CFR § 65.10 Mapping of Areas Protected by Levee Systems.**

(a) General. For purposes of the NFIP, FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive flood plain management criteria established by § 60.3 of this subchapter. Accordingly, this section describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the base flood. This information must be supplied to FEMA by the community or other party seeking recognition of such a levee system at the time a flood risk study or restudy is conducted, when a map revision under the provisions of Part 65 of this subchapter is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review will be for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and shall not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(b) Design criteria. For levees to be recognized by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:

(1) Freeboard. (i) Riverine levees must provide a minimum freeboard of three feet above the water-surface level of the base flood. An additional one foot above the minimum is required within 100 feet in either side of structures (such as bridges) riverward of the levee or wherever the flow is constricted. An additional one-half foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

(ii) Occasionally, exceptions to the minimum riverine freeboard requirement described in paragraph (b)(1)(i) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood elevation profile and include, but not necessarily be limited to an assessment of statistical confidence limits of the 100-year discharge; changes in stage-discharge relationships; and the sources, potential, and magnitude of debris, sediment, and ice accumulation. It must be also shown that the levee will remain structurally stable during the base flood when such additional loading considerations are imposed. Under no circumstances will freeboard of less than two feet be accepted.

(iii) For coastal levees, the freeboard must be established at one foot above the height of the one percent wave or the maximum wave runup (whichever is greater) associated with the 100-year stillwater surge elevation at the site.

(iv) Occasionally, exceptions to the minimum coastal levee freeboard requirement described in paragraph (b)(1)(iii) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee. Under no circumstances, however, will a freeboard of less than two feet above the 100-year stillwater surge elevation be accepted.

(2) Closures. All openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

**Figure 620-2a. FEMA's levee safety criteria (page one).**

(3) Embankment protection. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability. The factors to be addressed in such analyses include, but are not limited to: Expected flow velocities (especially in constricted areas); expected wind and wave action; ice loading; impact of debris; slope protection techniques; duration of flooding at various stages and velocities; embankment and foundation materials; levee alignment, bends, and transitions; and levee side slopes.

(4) Embankment and foundation stability. Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (COE) manual, "Design and Construction of Levees" (EM 1110-2-1913, Chapter 6, Section II), may be used. The factors that shall be addressed in the analyses include: Depth of flooding, duration of flooding, embankment geometry and length of seepage path at critical locations, embankment and foundation materials, embankment compaction, penetrations, other design factors affecting seepage (such as drainage layers), and other design factors affecting embankment and foundation stability (such as berms).

(5) Settlement. Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be

maintained within the minimum standards set forth in paragraph (b)(1) of this section. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in the COE manual, "Soil Mechanics Design--Settlement Analysis" (EM 1100-2-1904) must be submitted.

(6) Interior drainage. An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than one foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters.

(7) Other design criteria. In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA will also provide the rationale for requiring this additional information.

(c) Operation plans and criteria. For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

**Figure 620-2b. Page two of FEMA's levee safety criteria.**

(1) Closures. Operation plans for closures must include the following:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provisions for periodic operation, at not less than one year intervals, of the closure structure for testing and training purposes.

(2) Interior drainage systems. Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provision for manual backup for the activation of automatic systems.

(iv) Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than one year shall elapse between either the inspections or the operations.

(3) Other operation plans and criteria. Other operating plans and criteria may be required by FEMA to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(d) Maintenance plans and criteria. For levee systems to be recognized as providing protection from the base flood, the maintenance criteria must be as described herein. Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner. All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance. This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, maintenance plans shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

(e) Certification requirements. Data submitted to support that a given levee system complies with the structural requirements set forth in paragraphs (b)(1) through (7) of this section must be certified by a registered professional engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given at § 65.2 of this subchapter. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

[52 *FR* 30316, Aug. 25, 1986]

**Figure 620-2c. Page three of FEMA's levee safety criteria.**

## 630 DAM SAFETY

### Summary of Activity 630

**631 Credit Points.** There are two elements in this activity for a maximum of 175 points.

- a. State dam safety program (SDS): Up to 75 points are provided if the community is in a state with a dam safety program that has been accepted by FEMA for Community Rating System (CRS) credit. The state dam safety office must have stated that the community's program is in compliance with the state program.
- b. Dam failure emergency action plan (DFP): Up to 100 points are provided for the community's dam failure emergency action plan.

**632 Impact Adjustment.** There is no impact adjustment for SDS. The credit points for DFP are adjusted in one of three ways.

- a. Under Option 1, if the plan covers all buildings in the Special Flood Hazard Area (SFHA), the impact adjustment ratio is 1.0.
- b. Under Option 2, if the plan does not cover all buildings in the SFHA, a default impact adjustment ratio of 0.25 may be used.
- c. Under Option 3, if the plan does not cover all buildings in the SFHA, the impact adjustment ratios reflect the proportion of the buildings in the SFHA covered by the plan.

**633 Credit Calculation.** The credit points for DFP are multiplied by the impact adjustment ratios and added to SDS.

### 634 Credit Documentation.

The community must have the following available to verify implementation of this activity.

- a. [Required only if applying for DFP credit under Section 631.b.1] The portions of the emergency plan or other documentation that show that it has dam failure inundation areas, flood elevations, and estimated arrival times, an annual report from the dam operator, annual exercises; and monthly communications checks.
- b. [Required only if applying for credit under Section 631.b.2] The portions of the community's emergency plan that detail at least three methods of disseminating a dam failure warning.
- c. [Required only if the community is applying for credit under Section 631.b.3]
  1. The portions of the community's emergency plan that indicate evacuation routes and procedures for notifying and evacuating critical facilities; and
  2. Documentation of the notification of occupants of the dam failure inundation area as discussed in Section 631.b.3.
- d. [If Option 3 was used to determine the impact adjustment ratios] The Impact Adjustment Map.

The community must submit the following with its annual CRS recertification:

- e. [Required only if the community applying for credit under Section 631.b.1] Documentation of the monthly communications checks between dam operators and local officials and a description of the dam failure exercise, drill, or response to an emergency or disaster during the previous year.

### 635 For More Information.



## 630 DAM SAFETY

Credit is provided to the community based on its state's dam safety program.

**Background:** A state dam safety program reduces the probability of dam failure and includes a much larger jurisdiction than the community. Community management of areas subject to flooding in the event of dam failure and community preparedness for dam failure further reduce the damage potential.

Dams can create a false sense of security for floodplain residents. Unlike levees, they do not need flood conditions to fail. They can be breached with little or no warning and send a wall of water downstream. The combination of high velocity, great depth, and short notice has proven particularly deadly and destructive. One way to minimize this hazard is to enforce construction and maintenance standards—usually through a state dam safety program.

There are almost 11,000 dams in the United States that are classified as “high hazard” dams. A “high hazard” dam is one whose failure would threaten life and property. Of these 11,000 high hazard dams, fewer than 5,000 have emergency action plans (EAPs). All states require EAPs for new dams, but only a few have statutes that require owners of existing dams to produce EAPs.

Although the legal definition of a dam for regulatory purposes varies from state to state, many dams are very small. A dam may be as low as 5 feet, with an impoundment of no more than 5 acre-feet of water. In many states, highway and railroad embankments may legally be dams, although they may not be rigorously regulated. This means that, if your community has one or more high hazard dams upstream, it should not necessarily expect a 100-foot wall of water to suddenly swamp developed areas. On the other hand, if a dam failure caused even a 25- or 50-year flood with no warning or preparations on a clear day, the results could be devastating.

### **Activity Description:**

- a. The state dam safety element (SDS) provides credit for any community in a state with a dam safety program that has submitted the necessary documentation of its program to the Department of Homeland Security's Federal Emergency Management Agency (FEMA). Community Rating System (CRS) credit for this element will be determined for each state based upon the elements of its dam safety program.

Two conditions are prerequisites for credit under this element:

1. If a state does not receive credit for this element, no community within that state is eligible for credit for this element.

## 634 Credit Documentation

There is no documentation required for the community to receive credit points based on the state's dam safety program. The credit points will automatically be added to the community's credit, provided the state verifies community compliance with the state's program.

The community must provide the following documentation:

a. [Required only if the community is applying for credit under Section 631.b.1] The portions of the community's emergency plan or other documentation that show the dam failure inundation areas, flood elevations, and estimated arrival times, an annual report from the dam operator, annual exercises, and monthly communications checks.

b. [Required only if the community is applying for credit under Section 631.b.2] The portions of the community's emergency plan that detail at least three methods of disseminating a dam failure warning.

c. [Required only if the community is applying for credit under Section 631.b.3]

1. The portions of the community's emergency plan that indicate evacuation routes and procedures for notifying and evacuating critical facilities; and

2. A copy of the materials that notify occupants of the dam failure inundation area as discussed in Section 631.b.3. The materials must be distributed each year and must reach at least 90% of the properties in the dam failure inundation area. An outreach project to the community or to floodplain properties credited under Activity 330 (Outreach Projects) may qualify for this credit provided that it explains the dam failure hazard, the area affected, evacuation routes, and flood safety topics appropriate to the hazard.

d. [Required only if the community determines the impact adjustment ratios using Option 3 (633.c)] The Impact Adjustment Map with the appropriate acronyms marked. Documentation showing how the impact adjustment ratio was determined.

The community must submit the following documentation with its annual CRS recertification (see Section 214):

e. [Required only if the community is applying for credit under Section 631.b.1] Documentation of the monthly communications checks between the dam operators and local emergency officials and a description of the exercise or drill of the dam failure emergency plan or the response to an actual emergency or disaster conducted during the previous year. The description must include a list of who participated and any lessons learned from the exercise, drill, emergency, or disaster.

## 635 For More Information

Additional information, reference materials, and examples can be found at the CRS Resource Center at <http://training.fema.gov/EMIWeb/CRS/>.

a. More information on dam safety activities and state programs can be found on the website for the Association of State Dam Safety Officials at <http://www.damsafety.org/> and on FEMA's dam safety website, <http://www.fema.gov/fima/damsafe>.

b. The following can be obtained from

Federal Emergency Management Agency  
Mitigation Directorate  
500 C Street, S.W.  
Washington, D.C. 20472

*Model State Dam Safety Program*, Association of State Dam Safety Officials, FEMA-123, 1998.

*Successes & Challenges: The National Dam Safety Program*. Association of State Dam Safety Officials, 2002.

*Suggested Procedures for Safety Inspection of Dams*, Ohio Department of Natural Resources, 1987.

*Dam Safety: An Owner's Guidance Manual*, FEMA-145, 1987.

*Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners*, FEMA-64, 2002.

*Dam Inundation Mapping Pilot Study*, FEMA, 1999.

FEMA's Dam Safety Office website: <http://www.fema.gov/fima/damsafe/>.

c. The U.S. Army Corps of Engineers can provide technical information and advice to communities interested in developing dam safety programs. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the District Office of the Corps.

The National Inventory of Dams (NID) includes almost 70,000 dams. The Corps hosts the NID at <http://crunch.tec.army.mil/nid/webpages/nid.cfm>.

## Appendix B ACRONYMS

The acronyms used in the *CRS Coordinator's Manual* are listed below. The section number tells where the first detailed description of the acronym appears in the manual.

Most of the acronyms are elements of the credited activities in the 300 through 600 series. All elements are in capital letters. Attributes of an element are in lower-case letters. The lower-case letters, “a,” “b,” “c,” and “r,” are prefixes. The letters “i,” “n,” and “s” are suffixes to the elements. For example, “bAR” represents the number of buildings acquired or relocated. The “b” is described in Section 302 and the “AR” is described in Section 521.

Acronym	Section	Description
aDC	542	area of the developed portion of the community
AFD	411	additional flood data
AFE	411	advisory flood elevations
AGR	710	average growth rate
AMD	441	additional map data
AR	521	acquisition or relocation of floodprone buildings
aRF	402	area of the regulatory floodplain
aRFM	441	area of the regulatory floodplain measured in square miles
ASDSO	630	Association of State Dam Safety Officials
ASFPM	431	Association of State Floodplain Managers
aW	452	area of a community's watersheds
AW-nnn	210	activity worksheet number nnn
aXXX	402	area affected by element XXX
bAR	521	number of buildings acquired or relocated
BC	431	building code
BCEGS	211	Building Code Effectiveness Grading Schedule
BFE	130	base flood elevation
BMM	441	benchmark maintenance
BMP	451	best management practices (for stormwater quality)
bPO	312	number of post-FIRM buildings in the SFHA
bPR	312	number of pre-FIRM buildings in the SFHA
bRL	521	number of buildings on the repetitive loss list acquired or relocated
bSF	303	number of buildings in the SFHA
bSRL	520	number of Severe Repetitive Loss Properties acquired, relocated, or otherwise removed
bXXX	302	number of buildings affected by element XXX
CAD	441	computer aided design (computer program)
CAZ	431	coastal AE zone regulations
CBRA	320	Coastal Barrier Resources Act
CDR	541	channel and basin debris removal
CEO	130	Chief Executive Officer of a community
CFP	611	critical facilities planning
CFM	431	Certified Floodplain Manager

Acronym	Section	Description
CFR	310	<i>Code of Federal Regulations (in the Federal Register)</i>
CGA	711	community growth adjustment
CMGR	711	community-supplied growth rate
CRS	110	Community Rating System
CSI	431	cumulative substantial improvement regulations
cT	720	community's total CRS credit points
CTP	410	Cooperating Technical Partner
cXXX	223	credit points for element or activity XXX
<b>■</b> DAYS	411	the number of days before adoption of advisory flood elevations
DFH	341	disclosure of the flood hazard by real estate agents
DFP	631	dam failure emergency action plan
DOH	341	disclosure of other hazards, such as subsidence
DR	421	deed restrictions placed on open space properties
DS	451	design storms used in stormwater management regulations
EAP	631	dam failure emergency action plan
EC	311	maintaining FEMA elevation certificates
ECCF	311	maintaining elevation certificates in computer format
ECPO	311	maintaining post-FIRM elevation certificates
ECPR	311	maintaining pre-FIRM elevation certificates
ECWS	311	posting elevation certificate data on a website
EDM	441	erosion data maintenance
EMI	364	FEMA's Emergency Management Institute
ENL	431	regulations limiting enclosures below elevated floors
EPM	541	coastal erosion protection maintenance
ESC	451	erosion and sedimentation control regulations
EWD	611	emergency warning dissemination
FB	431	feet of freeboard above the base flood elevation
FDN	431	foundation protection regulations
FEMA	113	Federal Emergency Management Agency
FHBM	441	Flood Hazard Boundary Map
FIRM	113	Flood Insurance Rate Map
FM	441	FIRM maintenance
FMA	510	Flood Mitigation Assistance program
FMP	510	floodplain management planning
FPA	361	flood protection assistance
FPI	531	flood protection improvement
FPB	531	flood protection level before the project was constructed
FPP	531	flood protection provided by the project
FRB	431	floodplain regulations that require freeboard
FRX	451	freeboard for new buildings in B, C, D, and X Zones

Acronym	Section	Description
FTR	611	flood threat recognition system
FWS	411	more restrictive floodway standard
GIS	441	geographic information system
HCP	511	Habitat Conservation Plan
HMGP	510	Hazard Mitigation Grant Program
HSS	410	higher study standard
ICC	431	increased cost of compliance
ISO	113	The Insurance Services Office
LIB	351	flood protection library
LDC	431LD	land development criteria
LEV	410	leverage
LOMA	321	Letter of Map Amendment
LOMR	321	Letter of Map Revision
LP	621	levee protection
LPD	351	locally pertinent documents for a library
LPL	621	levee protection level
LSI	431	lower substantial improvement threshold
LZ	431LD	low density zoning
LZs	431LD	zoning: "s" = maximum number of acres per building
MHP	431	manufactured home park regulations
MI	321	providing map information and FIRM data
MLS	340	Multiple Listing Service
NB	421	open space with natural and beneficial functions
NBR	431	regulations to protect natural and beneficial functions
NFIP	111	National Flood Insurance Program
NGS	441	National Geodetic Survey
NGVD	130	National Geodetic Vertical Datum
NID	635	National Inventory of Dams
NOAA	631	National Oceanic and Atmospheric Administration
NS	410	new flood study
NSRS	441	National Spatial Reference System
ODR	341	other disclosure requirements
OHS	431	other higher regulatory standards
OPA	331	additional outreach projects
OPC	331	outreach project to the entire community
OPF	331	outreach project to floodplain residents

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Acronym	Section	Description
OPS	331	outreach project based on a strategy
ORE	611	other flood warning response efforts
ORS	311	off-site records storage
OS	421	floodplain lands preserved as open space
PB	531	protected buildings
PBi	531	protection credit for building “i”
PCF	431	regulations that protect critical facilities
PFI	330	promotion of flood insurance
PSC	431	regulations that protect floodplain storage capacity
PUB	451	stormwater facilities subject to public maintenance
REB	341	real estate agent brochure (explains flood hazards)
rXXX	220	ratio of the buildings or area affected by XXX
SDR	541	stream dumping regulations
SDS	631	state dam safety program
SFHA	130	Special Flood Hazard Area
SFIP	431	Standard Flood Insurance Policy
SH	401	special flood-related hazard
SHR	430	special hazard regulations
SMR	451	stormwater management regulations
SMS	431	state-mandated regulatory standards
SRC	61	StormReady community
SZ	451	size of development subject to stormwater management
TU <sub>i</sub>	531	technique used to protect building “i”
TVA	344	Tennessee Valley Authority
URL	351	universal resource locator
USGR	711	U.S. Census growth rate
WEB	351	flood protection website
WMP	451	watershed master plan
WQ	451	stormwater management regulations for water quality
XXX	B-1	element acronym or variable number
XXX <sub>n</sub>	222	element number “n,” e.g., OPA <sub>n</sub> = OPA1, OPA2, and OPA3
YCM	441	number of years between checks of reference marks

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NFIP Requirement	Related CRS Credit
9. Require that recreational vehicles on a site for more than 180 days meet the requirements of (b)1 and (e)2-7.	N/A
60.4 Flood plain management criteria for mudslide (i.e., mudflow) -prone areas.	See <i>Special Hazards Supplement to the CRS Coordinator's Manual</i> .
60.5 Flood plain management criteria for flood-related erosion-prone areas.	See <i>CRS Credit for Management of Coastal Erosion Hazards</i> .
60.6 Variances and exceptions	N/A
60.7 Revisions of criteria for flood plain management regulations.	N/A
60.8 Definitions (references the definitions in Part 59)	N/A
<i>Subpart B - Requirements for State Flood Plain Management Regulations</i>	N/A
<i>Subpart C - Additional Considerations in Managing Flood-Prone, Mudslide (i.e., Mudflow)-Prone, and Flood-Related Erosion-Prone Areas</i>	N/A: These are planning considerations, not requirements. Implementing them would exceed the minimum NFIP requirements.

## Regulations Credited by the CRS Not Related to Minimum NFIP Requirements

### Regulations credited in Activity 430 (Higher Regulatory Standards):

Section 431.b: Requiring that fill and building foundations be designed to protect them from damage due to erosion, scour and settling (FDN).

Section 431.e: Requiring that critical facilities, such as hospitals and hazardous materials storage sites, be protected from higher flood levels (PCF).

Section 431.f: Maintaining floodplain storage by prohibiting fill or by requiring compensatory storage (PSC). While floodway regulations preserve flood conveyance, they allow the flood fringe to be filled in which can have a significant effect on downstream flood heights.

Section 431.g: Prohibiting or regulating developments that can have an adverse impact on public health or water quality, including alterations to shoreline, channels, and banks (NBR).



Section 431.i: Implementing other regulations that exceed the minimum requirements of the NFIP Regulations (OHS).

Section 431LZ: Zoning to minimize the number of buildings in the floodplain to reduce the damage potential and help maintain flood storage and conveyance capacity (LZ).

The NFIP Regulations are oriented toward the more common overbank and coastal flooding. Special hazards regulations (“SH”) are requirements tailored to different conditions. They are described in publications on special hazards and coastal hazards listed in Appendix E.

**Regulations credited under other activities:**

Section 341.b: Requiring developers or sellers to publicize or disclose the flood hazard on their properties (ODR).

Section 421: Prohibiting new buildings in the floodway, V Zone, or other part of the floodplain to preserve open space (OS).

Section 431LD.a: Regulations that encourage preserving floodplain lands as open space.

Section 451.a: Requiring new developments to provide retention or detention of their stormwater runoff to minimize the increase in flood flows due to watershed urbanization (SMR).

Section 451.e: Requiring erosion and sedimentation control during construction projects to reduce siltation and the resulting loss of channel carrying capacity (ESC).

Section 451.f: Requiring developers to implement appropriate “best management practices” that will improve the quality of stormwater runoff (WQ).

Section 541.b: Prohibiting dumping or placing debris in stream channels (SDR).

## **Appendix G**

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**National Flood Insurance Program  
Community Rating System**

**ACTIVITY  
WORKSHEETS**



**FEMA**

Public reporting burden for this information collection is estimated at 35 hours for the application and certification process. Burden means the time, effort, and financial resources expended by persons to generate, maintain, retain, disclose, or to provide information to us. You may send comments regarding the burden estimate or any aspect of the collection, including suggestions for reducing the burden to: Information Collections Management, U.S. Department of Homeland Security, Emergency Preparedness and Response Directorate, Federal Emergency Management Agency, 500 C St., S.W., Washington, D.C. 20472, Paperwork Reduction Project (OMB Control Number 1660-0022). You are not required to respond to this collection of information unless a valid OMB control number is displayed in the upper right corner of this form. Note: do not send your completed questionnaire to this address.

<b>Activity Worksheet No.</b>	<b>Title</b>
AW-210	CRS Application Cover Page
AW-214	Recertification Worksheet
AW-230	Modification/Cycle Cover Page
AW-310	Elevation Certificates
AW-320	Map Information Service
AW-330	Outreach Projects
AW-340	Hazard Disclosure
AW-350	Flood Protection Information
AW-360	Flood Protection Assistance
AW-410	Additional Flood Data
AW-420	Open Space Preservation
AW-430	Higher Regulatory Standards
AW-430LD	Land Development Criteria
AW-440	Flood Data Maintenance
AW-450	Stormwater Management
AW-501	Repetitive Loss List
AW-502	Repetitive Loss Requirements
AW-510	Floodplain Management Planning
AW-520	Acquisition and Relocation
AW-530	Flood Protection
AW-540	Drainage System Maintenance
AW-610	Flood Warning Program
AW-620	Levee Safety
AW-630	Dam Safety
AW-710	Community Growth Adjustment
AW-720	Community Credit Calculations
AW-720m	Community Credit Calculations (Modification)
AW-CB	Closed Basin Lake Hazards
AW-CE	Coastal Erosion Hazards
AW-DB	Dunes and Beaches
AW-IJ	Ice Jam Hazards
AW-MF	Mudflow Hazards
AW-SU	Land Subsidence Hazards
AW-TS	Tsunami Hazards
AW-UF	Uncertain Flow Path Hazards

## INSTRUCTIONS

The following activity worksheets are to facilitate calculations of Community Rating System (CRS) credit points. They are not used for a community's initial application to the CRS. INITIAL APPLICATIONS FOR THE CRS ARE SUBMITTED USING THE WORKSHEET PAGES IN THE *CRS APPLICATION*.

These activity worksheets are for internal use by the community, for submittal of modifications, and for use by the ISO/CRS Specialist during verification and cycle verification of a community's program.

These worksheets are designed to be used in conjunction with the *CRS Coordinator's Manual*. Each section of the worksheets corresponds to a section in the *Coordinator's Manual*. If a section is missing from the worksheets, it is because the *Coordinator's Manual* shows that no data or calculations are required for that section.

It is recommended that these worksheets be photocopied before they are used.

When used for submitting a modification, the Credit Points, Credit Calculation, and Credit Documentation parts of the worksheets should be completed for each activity for which credit is requested. Fill in the blanks with the value for each variable. DO NOT COMPLETE THE VERIFICATION SECTIONS. That is done by the ISO/CRS Specialist during the verification or cycle verification visit.

Each worksheet has a Credit Documentation section. Check the blanks to denote that all of the required documentation is available. In some cases, the documentation must be provided with the modification. In others, checking the appropriate spaces confirms that you will provide the documentation when needed. Please consult the *CRS Coordinator's Manual* if you have questions about which documentation is to be provided with the request for a modification.

ATTACH THE REQUIRED DOCUMENTATION FOR AN ACTIVITY TO THE WORKSHEET FOR THAT ACTIVITY. If the documentation is ordinance language, attach only the necessary page(s) from the ordinance.

MARK THE MARGINS OF THE DOCUMENTATION WITH THE ACRONYM for the element so the ISO/CRS Specialist can identify the basis for the credit. If the document is a certification, it must have an original signature (and seal if required).

Not included in this document are the activity worksheets needed for obtaining credit for management of special flood-related hazards, such as uncertain flow paths, closed basin lakes, ice jams, land subsidence, coastal dunes and beaches, mudflows, coastal erosion, and tsunamis. Those worksheets can be found in the appropriate publications listed in Appendix E of the *CRS Coordinator's Manual* and in Appendix B of the *CRS Application*.

Two other worksheets are not part of this document: AW-214 (Recertification) and AW-501 (Repetitive Loss List). When needed, these two worksheets are generated separately by the Department of Homeland Security's Federal Emergency Management Agency (FEMA) and provided to the community.

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Community : \_\_\_\_\_

## 230 MODIFICATION/CYCLE COVER PAGE

1. Community Name: \_\_\_\_\_ State: \_\_\_\_ BCEGS: \_\_\_\_ / \_\_\_\_  
NFIP Number: \_\_\_\_\_ FIRM Effective Date: \_\_\_\_\_, \_\_\_\_  
Population: \_\_\_\_\_ Current FIRM Date: \_\_\_\_\_, \_\_\_\_  
Modification/Cycle Date: \_\_\_\_\_, 200\_\_ County: \_\_\_\_\_

2. Chief Executive Officer: \_\_\_\_\_ CRS Coordinator: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_

Coordinator's Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Coordinator's email: \_\_\_\_\_

3. I hereby certify that \_\_\_\_\_ [community name] is implementing the following activities (check the ones that apply). We are modifying or adding activities that have an "m" for modifying, "a" for addition, or "d" for dropping in the blank and have attached new activity worksheets and documentation. We will continue to implement these activities and will advise FEMA if any of them are not being conducted in accordance with this certification. We will cooperate with the ISO/CRS Specialist verification visit and will submit the documentation and annual recertification needed to validate our program.

_____ 310 Elevation Certificates	_____ 440 Flood Data Maintenance
_____ 320 Map Information Service	_____ 450 Stormwater Management
_____ 330 Outreach Projects	_____ Repetitive Loss Requirements
_____ 340 Hazard Disclosure	_____ 510 Floodplain Management Planning
_____ 350 Flood Protection Information	_____ 520 Acquisition and Relocation
_____ 360 Flood Protection Assistance	_____ 530 Flood Protection
_____ 410 Additional Flood Data	_____ 540 Drainage System Maintenance
_____ 420 Open Space Preservation	_____ 610 Flood Warning Program
_____ 430 Higher Regulatory Standards	_____ 620 Levee Safety
_____ 430LD Land Development Criteria	_____ 630 Dam Safety

4. I hereby certify that to the best of my knowledge and belief, we are maintaining in force all flood insurance policies that have been required of us as a condition of federal financial assistance for insurable buildings owned by us and located in the Special Flood Hazard Area shown on our Flood Insurance Rate Map. I further understand that disaster assistance for flooded public buildings in the Special Flood Hazard Area will be reduced by the amount of flood insurance available from the National Flood Insurance Program for the buildings, even if we do not have a policy.

5. Signed: \_\_\_\_\_ (Chief Executive Officer)



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AW-214	Recertification Worksheet
AW-230	Modification/Cycle Cover Page
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AW-320	Map Information Service
AW-330	Outreach Projects
AW-340	Hazard Disclosure
AW-350	Flood Protection Information
AW-360	Flood Protection Assistance
AW-410	Additional Flood Data
AW-420	Open Space Preservation
AW-430	Higher Regulatory Standards
AW-430LD	Land Development Criteria
AW-440	Flood Data Maintenance
AW-450	Stormwater Management
AW-501	Repetitive Loss List
AW-502	Repetitive Loss Requirements
AW-510	Floodplain Management Planning
AW-520	Acquisition and Relocation
AW-530	Flood Protection
AW-540	Drainage System Maintenance
AW-610	Flood Warning Program
AW-620	Levee Safety
AW-630	Dam Safety
AW-710	Community Growth Adjustment
AW-720	Community Credit Calculations
AW-720m	Community Credit Calculations (Modification)
AW-CB	Closed Basin Lake Hazards
AW-CE	Coastal Erosion Hazards
AW-DB	Dunes and Beaches
AW-IJ	Ice Jam Hazards
AW-MF	Mudflow Hazards
AW-SU	Land Subsidence Hazards
AW-TS	Tsunami Hazards
AW-UF	Uncertain Flow Path Hazards

Community : \_\_\_\_\_

### 310 ELEVATION CERTIFICATES

#### 312 Impact Adjustment:

a. Option 1:

1. rECPO = 1.0    2. rECPR = 1.0    3. rECCF = 1.0    4. rECWS = 1.0

b. Option 2:

1. rECPO = 0.25    2. rECPR = 0.25    3. rECCF = 0.25    4. rECWS = 0.25

c. Option 3:

1. rECPO =  $\frac{bECPO}{bPO}$  = \_\_\_\_\_    2. rECPR =  $\frac{bECPR}{bPR}$  = \_\_\_\_\_

3. rECCF =  $\frac{bECCF}{bEC \text{ _____} + bECPO \text{ _____} + bECPR \text{ _____}}$  = \_\_\_\_\_

4. rECWS =  $\frac{bECWS}{bEC \text{ _____} + bECPO \text{ _____} + bECPR \text{ _____}}$  = \_\_\_\_\_

#### 313 Credit Calculation:

a. cEC    cEC = \_\_\_\_\_

b. cECPO = ECPO \_\_\_\_\_ x rECPO \_\_\_\_\_    cECPO = \_\_\_\_\_

c. cECPR = ECPR \_\_\_\_\_ x rECPR \_\_\_\_\_    cECPR = \_\_\_\_\_

d. cECCF = ECCF \_\_\_\_\_ x rECCF \_\_\_\_\_    cECCF = \_\_\_\_\_

e. cECWS = ECWS \_\_\_\_\_ x rECWS \_\_\_\_\_    cECWS = \_\_\_\_\_

f. cORS = ORS    cORS = \_\_\_\_\_

g. Add lines a through f above = \_\_\_\_\_

c310 = value above rounded to the nearest whole number:    c310 = \_\_\_\_\_

Enter this value on AW-720-1.

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Community : \_\_\_\_\_

**314 Credit Documentation:**

- \_\_\_ a. [If the community applies for credit under ECPO or ECPR and used a form different from FEMA's] A copy of the local elevation certificate, along with documentation that FEMA has approved it. Note that a local elevation certificate can only be credited if it was used before 1999 or before the community joined the CRS, whichever is later.
- \_\_\_ b. [If the community applies for ECCF credit and is NOT using the CRS "Computerized Format for FEMA elevation certificates"] a copy of the computer format being used.
- \_\_\_ c. EC – Copies of completed elevation certificates  
OR  
\_\_\_ Certification letter if no new construction or substantial improvements.  
\_\_\_ ECPO – Copies of completed post-FIRM elevation certificates.  
\_\_\_ ECPR – Copies of completed pre-FIRM elevation certificates.  
\_\_\_ ECCF – Printout of sample Certificates.  
\_\_\_ ECWS – Printout of sample Certificates. Website address \_\_\_\_\_
- \_\_\_ d. Documentation showing how the impact adjustment ratios were determined and how the community maintains, stores, and provides copies of elevation certificates.

**The following will be needed at the annual recertification:**

- \_\_\_ e. ECCF – A disk with the elevation and floodproofing certificate data in computer format obtained since the last submittal.

---

Starting month/year for which certificates are consistently available: \_\_\_\_\_ ,

Office where requests should be submitted: \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ e-mail \_\_\_\_\_

How should requests for elevation and/or floodproofing certificates be submitted (mail, phone, fax, etc.)? \_\_\_\_\_

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Comments:

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AW-MF	Mudflow Hazards
AW-SU	Land Subsidence Hazards
AW-TS	Tsunami Hazards
AW-UF	Uncertain Flow Path Hazards

Community : \_\_\_\_\_

## 320 MAP INFORMATION SERVICE

### 322 Credit Calculation:

c320 = MI = \_\_\_\_\_

c320 = \_\_\_\_\_

Enter this value on AW-720-1.

### 323 Credit Documentation:

- a. Documentation that shows how the community publicizes the service each year.
- \_\_\_ 1. If the community publicizes this service through an annual outreach project credited under Activity 330 (OPC or OPS), "320" must be noted in the margin of the outreach project to the community (OPC) where the map information service is addressed. If an OPS is used, the public information strategy document must discuss the best way to publicize the map information service to the target audiences.
  - \_\_\_ 2. If the community publicizes this service through an annual outreach project that is not credited under Activity 330, attach a copy of the project. The materials must be distributed each year and must reach at least 90% of the target audience.
  - \_\_\_ 3. If the community sends a letter or e-mail directly to lending institutions and real estate and insurance agencies, attach a copy of the letter or e-mail message.
  - \_\_\_ 4. If the community notifies organizations of lending institutions and real estate and insurance agencies, attach copies of the notifications in their publications. If any organization has not yet published the notifications, documentation must include written assurance from the organization that it intends to publish the notification within six months of the Community Rating System (CRS) application date.
- \_\_\_ b. If another agency provides map information, documentation that the agency agrees to provide the service to all inquirers and will allow the CRS to verify its work.
- \_\_\_ c. Records of which institutions and agencies were notified of this service. If the community sends letters to institutions and agencies, a mailing list for those institutions and agencies.
- \_\_\_ d. A record or log that shows the level of service provided.
- \_\_\_ e. Documentation or notations on how the community keeps the FIRM updated.
- \_\_\_ Documentation or notations that the community has copies of all FIRMs since 1999 or the date the community applied for this credit, whichever is later.

---

Starting month/year for which certificates are consistently available: \_\_\_\_\_ , \_\_\_\_\_

Office where requests should be submitted \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ e-mail \_\_\_\_\_

How should requests for the service be made (mail, phone, fax, etc.)? \_\_\_\_\_

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Community : \_\_\_\_\_

### 330 OUTREACH PROJECTS

#### 331 Credit Points:

a.—c.

Variable:	<u>OPC</u>	<u>OPF</u>	<u>OPA1</u>	<u>OPA2</u>	<u>OPA3</u>
Points per topic:	6	13	2	2	2
<u>Topics covered</u>					
1. Local flood hazard:	_____	_____	_____	_____	_____
2. Flood safety:	_____	_____	_____	_____	_____
3. Flood insurance:	_____	_____	_____	_____	_____
4. Property protection:	_____	_____	_____	_____	_____
5. Natural & beneficial functions:	_____	_____	_____	_____	_____
6. Local flood hazard map:	_____	_____	_____	_____	_____
7. Flood warning system:	_____	_____	_____	_____	_____
8. Permit requirements:	_____	_____	_____	_____	_____
9. Substantial improvement/damage:	_____	_____	_____	_____	_____
10. Drainage maintenance:	_____	_____	_____	_____	_____
Total of above:	OPC = _____	OPF = _____	OPA1 = _____	OPA2 = _____	OPA3 = _____

d. OPS

1. Outreach Project pursuant to a strategy (100 points): \_\_\_\_\_
  2. Multi-hazard strategy (25 points): \_\_\_\_\_
- OPS = the total of lines 1 and 2 above: OPS = \_\_\_\_\_

e. PFI

1. Brochure or letter (10 or 45 points): \_\_\_\_\_
  2. Inclusion of photo(s) (5 points): \_\_\_\_\_
  3. Explanation of FIRM zones (15 points): \_\_\_\_\_
- PFI = the total of lines 1, 2 and 3 above: PFI = \_\_\_\_\_

#### 332 Credit Calculation:

c330 = EITHER

OPC \_\_\_\_\_ + OPF \_\_\_\_\_ + OPA1 \_\_\_\_\_ + OPA2 \_\_\_\_\_ + OPA3 \_\_\_\_\_ + PFI \_\_\_\_\_ c330 = \_\_\_\_\_

OR OPC \_\_\_\_\_ + OPF \_\_\_\_\_ + OPS \_\_\_\_\_ + PFI \_\_\_\_\_ c330 = \_\_\_\_\_

Enter this value on AW-720-1.



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Community : \_\_\_\_\_

**333 Credit Documentation:**

\_\_\_\_ a. OPC: Copies of the materials, marked with the topics covered.  
Date sent: \_\_\_\_\_

\_\_\_\_ OPF: Copies of the materials, marked with the topics covered.  
Date sent: \_\_\_\_\_

\_\_\_\_ 90% Coverage Documentation

\_\_\_\_ OPA1: A description of the project with copies of the public information materials that were distributed, marked with the topics covered.  
Date undertaken: \_\_\_\_\_  
Example or description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_ OPA2: A description of the project with copies of the public information materials that were distributed, marked with the topics covered.  
Date undertaken: \_\_\_\_\_  
Example or description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_ OPA3: A description of the project with copies of the public information materials that were distributed, marked with the topics covered.  
Date undertaken: \_\_\_\_\_  
Example or description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_ PFI: A copy of the letter or brochure mailed to \_\_\_ entire community or \_\_\_ SFHA properties

\_\_\_\_ b. OPS: A copy of the public information program strategy marked with the criteria that must be met. Include documentation that the strategy is being implemented.

\_\_\_\_ c. Documentation that shows when the projects were undertaken.

- \_\_\_\_ d. PFI - Prerequisites:
1. Number of buildings in the community: \_\_\_\_\_
  2. Number of apartments and condominium units in the community: \_\_\_\_\_
  3. Number of buildings in the SFHA: \_\_\_\_\_
  4. Number of apartments and condominiums in the SFHA: \_\_\_\_\_
  5. Notes on how these numbers were calculated:

**The following will be needed at the annual recertification:**

\_\_\_\_ e. Copies of the outreach projects that were conducted that year.

\_\_\_\_ f. OPS - A copy of the annual OPS evaluation.

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AW-UF	Uncertain Flow Path Hazards

Community : \_\_\_\_\_

**340 HAZARD DISCLOSURE**

**342 Credit Calculation:**

- a. DFH: DFH = \_\_\_\_\_
- b. ODR: ODR = \_\_\_\_\_
- c. REB: REB = \_\_\_\_\_
- d. DOH: DOH = \_\_\_\_\_
- e. Add lines a through d above: c340 = \_\_\_\_\_

Enter this value on AW-720-1.

**343 Credit Documentation:**

- a. DFH: Documentation that demonstrates that real estate agents are advising potential property purchasers of the flood hazard and the flood insurance purchase requirement.
  - \_\_\_\_\_ Disclosure notices from at least five real estate agencies. Blank forms are not acceptable documentation. OR
  - \_\_\_\_\_ State law that requires real estate agents to advise people whether a property is located in a Special Flood Hazard Area.
- b. ODR: A copy of ordinance or law language requiring one or more additional disclosure methods at the time of sale or rental of a property. The acronym "ODR" must be marked in the margin of the sections that pertain to this element.
  - \_\_\_\_\_ ODR1: Regulation: \_\_\_\_\_
  - \_\_\_\_\_ ODR2: Regulation: \_\_\_\_\_
  - \_\_\_\_\_ ODR3: Regulation: \_\_\_\_\_
- c. REB: A brochure or other document that is made available to interested parties by real estate agents. The document must advise people looking to purchase property to investigate the flood hazard before they buy.
- d. DOH: Documentation that the DFH notification includes disclosure of other flood-related hazards, such as erosion, subsidence, or wetlands.

Comments:

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AW-TS	Tsunami Hazards
AW-UF	Uncertain Flow Path Hazards

Community : \_\_\_\_\_

### 350 FLOOD PROTECTION INFORMATION

#### 351 Credit Points:

a. LIB:

- 1. FIRM, Floodway Map, and explanation (4 points): \_\_\_\_\_
- 2. Flood insurance (2 points): \_\_\_\_\_
- 3. Building protection measures (8 points): \_\_\_\_\_
- 4. Floodplain management or hazard mitigation (3 points): \_\_\_\_\_
- 5. Natural and beneficial floodplain functions (3 points): \_\_\_\_\_
- 6. Directory of local sources of more information (3 points): \_\_\_\_\_
- 7. Special Hazards (2 points) \_\_\_\_\_

LIB = the total of lines 1 through 7 above

LIB = \_\_\_\_\_

b. LPD:

LPD = \_\_\_\_\_

c. WEB:

1. Prerequisites:

- \_\_\_ (a) Site is easy to locate using the community's name.
- \_\_\_ (b) Easy to get to the flood information from the home page.
- \_\_\_ (c) Links are pertinent to the community's flood conditions.
- \_\_\_ (d) At least one link to FEMA's website.
- \_\_\_ (e) Site is reviewed and updated at least once each year.

2.(a) Outreach Project Topics:

- 1. Local flood hazard (4 points): \_\_\_\_\_
- 2. Flood safety (4 points): \_\_\_\_\_
- 3. Flood insurance (4 points): \_\_\_\_\_
- 4. Property protection (4 points): \_\_\_\_\_
- 5. Natural & beneficial functions (4 points): \_\_\_\_\_
- 6. Local flood hazard map (4 points): \_\_\_\_\_
- 7. Flood warning system (4 points): \_\_\_\_\_
- 8. Permit requirements (4 points): \_\_\_\_\_
- 9. Substantial improvement/damage (4 points): \_\_\_\_\_
- 10. Drainage maintenance (4 points): \_\_\_\_\_
- (b) Publicizing elevation certificates (2 points): \_\_\_\_\_
- (c) Real time river gauge data (10 points): \_\_\_\_\_
- (d) Other flood warning information (20 points): \_\_\_\_\_

WEB = the total of lines 2(a)—2(d) above:

WEB = \_\_\_\_\_

#### 352 Credit Calculation:

Add LIB, LPD, and WEB:

c350 = \_\_\_\_\_

Enter this value on AW-720-1.



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Community : \_\_\_\_\_

**353 Credit Documentation:**

- a. LIB: A statement from the head of the library that includes:
  - \_\_\_ 1. A list of the documents available in the library with their publication dates. Note which ones also qualify as locally pertinent documents for LPD credit. AND
  - 2. EITHER:
    - \_\_\_ (a) Certification that the documents have been entered into the library's card catalog or similar system. OR
    - \_\_\_ (b) A copy of the card catalog cards or printout of the automated system's inventory of flood documents. AND
  - \_\_\_ 3. A statement that adequate numbers of documents will be maintained and that the FIRMs and other materials will be kept up to date.
- \_\_\_ b. WEB: The URL of the community's website: \_\_\_\_\_  
\_\_\_ If appropriate, documentation that the website is publicized through an outreach project reaching 90% of community.

**The following will be needed at the annual recertification:**

- \_\_\_ c. WEB: Certification that the community has conducted its annual review and update of the information and links in its flood protection website.

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Comments:

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Community : \_\_\_\_\_

## 360 FLOOD PROTECTION ASSISTANCE

### 361 Credit Points:

FPA:

- a. Providing site-specific flood and flood-related data (10 points): \_\_\_\_\_
- b. Providing names of contractors and consultants (4 points): \_\_\_\_\_
- c. Providing material on how to select a contractor (3 points): \_\_\_\_\_
- d. Making site visits to review flood, drainage, and sewer problems (35 points): \_\_\_\_\_
- e. Advising and assisting on retrofitting techniques (14 points): \_\_\_\_\_
- f. Retrofitting Floodprone Residential Buildings course at EMI (5 points) OR FEMA's Retrofitting home study course (2 points): \_\_\_\_\_

FPA = the total of lines a through f above: FPA = \_\_\_\_\_

### 362 Credit Calculation:

c360 = FPA c360 = \_\_\_\_\_

Enter this value on AW-720-1.

### 363 Credit Documentation:

- a. A copy of the document used to publicize the service.
  - \_\_\_ An outreach project to the community (OPC or OPF) credited under Activity 330.
  - \_\_\_ An outreach project pursuant to the public information strategy (OPS) credited in Activity 330, provided the public information strategy document discusses the best way to advise the target audiences. OR
  - \_\_\_ An annual outreach project that advises all residents and businesses in the community or in the floodplain about the service, but is not credited under Activity 330 (e.g., a short notice with all tax or utility bills). The materials must be distributed each year and must reach at least 90% of the target audience.
- \_\_\_ b. A description of the technical qualifications of all persons who are providing the site visit and retrofitting assistance credited under Sections 361.d and e.
  - \_\_\_ If credit is being sought under Section 361.f for graduation from the EMI retrofitting course, a copy of the certificate of graduation.
- \_\_\_ c. If the person is not a community employee, a letter stating that the person and/or agency have agreed to do the work.
- \_\_\_ d. If the community is applying for credit under Section 361.b or c, a list of the names of contractors or consultants and/or a copy of the material the community provides on how to select a contractor.
- \_\_\_ e. If the community is applying for credit under Section 361.d or e, records noting the date and type of assistance given. The records must include the details of the findings and recommendations provided to the inquirer.

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Community : \_\_\_\_\_

### 410 ADDITIONAL FLOOD DATA

**NOTE: Make a copy of this worksheet for each AFD.** This worksheet is for AFD \_\_\_\_\_

#### 411 Credit Points:

a. NS \_\_\_\_\_

1. Delineation of an approximate A Zone: \_\_\_\_\_
2. Flood elevations for a site at time of development: \_\_\_\_\_
3. New profile or length of shoreline: \_\_\_\_\_
4. New profile with floodway or length of shoreline with coastal velocity zone delineation: \_\_\_\_\_
5. Repetitive loss area(s): \_\_\_\_\_

Add lines 1 through 5: NS\_\_ = \_\_\_\_\_

b. LEV\_\_ EITHER

1.  $\frac{\text{Non-FEMA share of study}}{\text{Total cost of study}}$  = \_\_\_\_\_

OR

2. A total of the following:

(a) 0.25 if better topographic map was contributed:

(b) 0.15 if other contributions were made to the study: = \_\_\_\_\_

LEV\_\_ = \_\_\_\_\_

c. HSS\_\_

1. Delineation of an approximate A Zone: \_\_\_\_\_
2. Flood elevations for a site at time of development: \_\_\_\_\_
3. New profile or length of shoreline: \_\_\_\_\_

HSS\_\_ = \_\_\_\_\_

d. FWS\_\_

FWS\_\_ = \_\_\_\_\_

e. CTP2\_\_

CTP2\_\_ = \_\_\_\_\_

#### 412 AFDi \_\_\_\_ Impact Adjustment:

a. Option 1: rAFD\_\_ = 1.0

b. Option 2: rAFD\_\_ = 0.25

c. Option 3: rAFD\_\_ =  $\frac{\text{aAFD}}{\text{aSFHA}}$  = \_\_\_\_\_

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Community : \_\_\_\_\_

**414 Credit Documentation:**

- a. The ordinance or law that adopts the flood study for regulatory purposes. AND/OR
  - The ordinance that requires site-specific flood elevation or floodway studies to be conducted at the time of permit application.
- b. EITHER:
  - A copy of each study or an explanation of the technique used and a licensed professional engineer's statement that the study technique is approved by FEMA. OR
  - A copy of the Flood Insurance Study pages or Letter of Map Revision (LOMR) that show that the study has been accepted by FEMA to revise the FIRM.
- c. If the community requested credit for the independent review, documentation that the state or other agency reviewed and accepted the study or analysis techniques for which credit is being requested.
  - NS: Documentation that new base flood elevations are higher than those shown in the FIRM.
  - NS: If credit for mapping a repetitive loss area is requested, the area must be identified on a map.
  - HSS: Documentation of the higher study standard used in the flood study.
  - FWS: The state or local law that sets the maximum allowable surcharge used in the study and a copy of the Floodway Data Table or similar documentation that shows the surcharge used in the study.
  - CTP1: Documentation that the community or other entity has signed the CTP agreement.
  - CTP2: Documentation showing the relationship between the study and the CTP agreement.
- d. LEV: Documentation of the non-FEMA share of the study and who paid for it.
- e. The Impact Adjustment Map if Option 3 is used.
- f. CTP2: Documentation that shows the relation between the study or standard and the CTP agreement.

**The following will be needed at the cycle verification visit:**

- g. [If the community has received credit for a new study (NS) under Section 411.a] A certification by the community's engineer that its regulatory floodplain maps and related data reflect current conditions.

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Comments: \_\_\_\_\_

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Community : \_\_\_\_\_

## 420 OPEN SPACE PRESERVATION

### 422 Impact Adjustment:

- a. Option 1: 1. rOS = 1.0                      2. rDR = 1.0                      3. rNB = 1.0  
b. Option 2: 1. rOS = 0.05                      2. rDR = 0.1                      3. rNB = 0.1  
c. Option 3:  
1. rOS =  $\frac{aOS}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_                      3. rNB =  $\frac{aNB}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_  
2. rDR =  $\frac{aDR}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

### 423 Credit Calculation:

- a. cOS = 725 x rOS \_\_\_\_\_                      cOS = \_\_\_\_\_  
b. cDR = 75 x rDR \_\_\_\_\_                      cDR = \_\_\_\_\_  
c. cNB = 100 x rNB \_\_\_\_\_                      cNB = \_\_\_\_\_  
d. cSHOS (Enter total 420 credit from  
all Special Hazards Worksheets)                      cSHOS = \_\_\_\_\_  
e. Add lines a through d above = \_\_\_\_\_  
c420 = value above rounded to the nearest whole number:                      c420 = \_\_\_\_\_

Enter this value on AW-720-1.

### 424 Credit Documentation:

- \_\_\_ a. Provide assurance that eligible properties will remain open with a marked-up copy of the restrictive ordinance language.  
\_\_\_ b. Provide assurance that eligible properties will remain open with a document from the owner(s).  
\_\_\_ c. DR: Attach a copy of the deed restriction(s).  
\_\_\_ d. NB: Attach a copy of the documentation from a professional in a natural science that the parcel has been preserved in or restored to an undeveloped natural state, or is otherwise deserving of preservation because of the natural and beneficial function(s) that it serves.  
\_\_\_ e. The Impact Adjustment Map.  
\_\_\_ f. EITHER the open space areas are \_\_\_ located within the SFHA, OR \_\_\_ outside the SFHA and documentation is attached showing that floodplain regulations are in effect in the area outside the SFHA.

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Community : \_\_\_\_\_

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Comments:

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AW-UF	Uncertain Flow Path Hazards

Community : \_\_\_\_\_

## 430 HIGHER REGULATORY STANDARDS

### 432 Impact Adjustment:

a. Option 1: Enter rOS from AW-420-1.

If the community did not apply for Activity 420, then rOS = 0

1. rFRB = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

6. rPSC = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

2. rFDN = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

7. rNBR = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

3. rCSI = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

8. rENL = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

4. rLSI = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

9. rOHS = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

5. rPCF = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

10. rCAZ = 1.0 - rOS \_\_\_\_\_ = \_\_\_\_\_

b. Option 2:

1. rFRB = 0.25

6. rPSC = 0.25

2. rFDN = 0.25

7. rNBR = 0.25

3. rCSI = 0.25

8. rENL = 0.25

4. rLSI = 0.25

9. rOHS = 0.25

5. rPCF = 0.25

10. rCAZ = 0.1

c. Option 3:

1. rFRB =  $\frac{aFRB}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

6. rPSC =  $\frac{aPSC}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

2. rFDN =  $\frac{aFDN}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

7. rNBR =  $\frac{aNBR}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

3. rCSI =  $\frac{aCSI}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

8. rENL =  $\frac{aENL}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

4. rLSI =  $\frac{aLSI}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

9. rOHS =  $\frac{aOHS}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_

5. rPCF =  $\frac{aPCF}{a500}$  \_\_\_\_\_ = \_\_\_\_\_

10. rCAZ =  $\frac{aCAZ}{aRF}$  \_\_\_\_\_ = \_\_\_\_\_



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Community : \_\_\_\_\_

**433 Credit Calculation:**

- a. cFRB = FRB \_\_\_\_\_ x rFRB \_\_\_\_\_ cFRB = \_\_\_\_\_
- b. cFDN = FDN \_\_\_\_\_ x rFDN \_\_\_\_\_ cFDN = \_\_\_\_\_
- c. cCSI = CSI \_\_\_\_\_ x rCSI \_\_\_\_\_ cCSI = \_\_\_\_\_
- d. cLSI = LSI \_\_\_\_\_ x rLSI \_\_\_\_\_ cLSI = \_\_\_\_\_
- e. cPCF = PCF \_\_\_\_\_ x rPCF \_\_\_\_\_ cPCF = \_\_\_\_\_
- f. cPSC = PSC \_\_\_\_\_ x rPSC \_\_\_\_\_ cPSC = \_\_\_\_\_
- g. cNBR = NBR \_\_\_\_\_ x rNBR \_\_\_\_\_ cNBR = \_\_\_\_\_
- h. cENL = ENL \_\_\_\_\_ x rENL \_\_\_\_\_ cENL = \_\_\_\_\_
- i. cOHS = OHS \_\_\_\_\_ x rOHS \_\_\_\_\_ cOHS = \_\_\_\_\_
- j. c430LD (from AW-430LD-2 and LD values from Special Hazards Worksheets): c430LD = \_\_\_\_\_
- k. cSH (Enter total 430 credit from all Special Hazards Worksheets): cSH = \_\_\_\_\_
- l. SMS \_\_\_\_\_ FRB \_\_\_\_\_ FDN \_\_\_\_\_ CSI \_\_\_\_\_ LSI \_\_\_\_\_ PCF \_\_\_\_\_  
 \_\_\_\_\_ PSC \_\_\_\_\_ NBR \_\_\_\_\_ ENL \_\_\_\_\_ OHS \_\_\_\_\_ LD \_\_\_\_\_  
 \_\_\_\_\_ SH \_\_\_\_\_ BC \_\_\_\_\_ STF \_\_\_\_\_ MHP \_\_\_\_\_ CAZ \_\_\_\_\_  
 \_\_\_\_\_ NS \_\_\_\_\_ HSS \_\_\_\_\_ FWS \_\_\_\_\_ OS \_\_\_\_\_ SMR \_\_\_\_\_  
 \_\_\_\_\_ (Other SMS: \_\_\_\_\_) \_\_\_\_\_ (Other SMS: \_\_\_\_\_)  
 1. 0.1 x (credit for SMS elements \_\_\_\_\_ ) = \_\_\_\_\_  
 2. Insurance agent training = \_\_\_\_\_  
 cSMS = the total of 1 and 2 above: cSMS = \_\_\_\_\_
- m. BC  
 1. 15 x (7 – BCEGS rating \_\_\_\_\_ ) = \_\_\_\_\_  
 2. I-Codes credit IBC \_\_\_\_\_ + IRC \_\_\_\_\_ + Other codes \_\_\_\_\_ = \_\_\_\_\_  
 cBC = total of 1 and 2 above: cBC = \_\_\_\_\_
- n. STF  
 1. All regulatory staff are CFMs (50 points) \_\_\_\_\_  
 2. All development projects reviewed and approved by CFM (25 points) \_\_\_\_\_  
 3. 5 points for each CFM or EMI course graduate (max 25 points) \_\_\_\_\_  
 cSTF = 1 or 2 or 3 above: cSTF = \_\_\_\_\_
- o. MHP cMHP = \_\_\_\_\_
- p. cCAZ = CAZ \_\_\_\_\_ x rCAZ \_\_\_\_\_ cCAZ = \_\_\_\_\_
- q. Add lines a through p above = \_\_\_\_\_
- c430 = value above rounded to the nearest whole number: c430 = \_\_\_\_\_

Enter this value on AW-720-1.

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Community : \_\_\_\_\_

**434 Credit Documentation:**

	a. Law or ordinance Language	c. Explanation/documentation of enforcement procedures	Copies of relevant permit records
FRB	_____	_____	_____
FDN	_____	_____	_____
CSI	_____	_____	_____
LSI	_____	_____	_____
PCF	_____	_____	_____
PSC	_____	_____	_____
ENL	_____	_____	_____
OHS	_____	_____	_____
NBR	_____	_____	_____
MHP	_____	_____	_____
CAZ	_____	_____	_____
NBR	_____ If credit is for regulations adopted pursuant to a Habitat Conservation Plan, attach the appropriate pages of the plan.		
LD	_____ AW-430LD is attached.		
SH	_____ AW and relevant documentation for each special hazard for which credit is requested is attached.		
SMS	_____ State law or regulation mandating a floodplain management standard is attached.		
	_____ State law or regulation has been approved under Uniform Minimum Credit.		
	_____ State law or regulation mandating flood insurance training for property insurance agents is attached.		
BC	_____ Law or ordinance language adopting I-Codes is attached.		
MHP	_____ Map showing one or more existing manufactured home parks or subdivisions in the regulatory floodplain. The base flood elevations are greater than 3 feet deep in these parks/subdivisions.		
CAZ	_____ Map of the community's designated Coastal AE Zone.		
_____	b. Impact Adjustment Option 3 – Attached is the Impact Adjustment Map.		
_____	d. STF: A copy of the certificate(s) of graduation or CFM certificate(s).		

Comments:

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Community : \_\_\_\_\_

To facilitate verification of this activity, please provide the names of the CRS Coordinator and planning director if other than the CRS Coordinator:

	CRS Coordinator	Local Planning Director
Name:	_____	_____
Title:	_____	_____
Phone:	_____	_____
Fax:	_____	_____
Address:	_____	_____
	_____	_____
E-mail:	_____	_____

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Comments:

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\_\_\_\_\_

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Community : \_\_\_\_\_

## 440 FLOOD DATA MAINTENANCE

### 441 Credit Points:

a. AMD:

1. Prerequisites:

\_\_\_ (a) The system is used regularly by the community regulatory staff.

\_\_\_ (b) New data are added at least annually.

\_\_\_ (c) Digitized data will be made available annually to FEMA.

2. Credit Points:

(a) Regulatory floodplain, corporate limits, streets,  
and parcels/lots (32 points): \_\_\_\_\_

(b) Location of buildings (15 points): \_\_\_\_\_

(c) Floodways or coastal high hazard areas (8 points): \_\_\_\_\_

(d) Base flood elevations (8 points): \_\_\_\_\_

(e) FIRM zone attributes (6 points): \_\_\_\_\_

(f) 500-year elevations or boundaries (8 points): \_\_\_\_\_

(g) Other natural hazard areas (8 points): \_\_\_\_\_

(h) Topographic contour lines (10 or 20 points): \_\_\_\_\_

(i) Floodplain data in tax assessment data base (8 points): \_\_\_\_\_

(j) Overlays for previous FIRMs (8 points): \_\_\_\_\_

(k) Other regulatory or mitigation overlays (8 points): \_\_\_\_\_

AMD = the total of lines (a) through (k) above: AMD = \_\_\_\_\_

b. BMM:

(a)  $BMM = \frac{15 \times NBM}{aRFM} =$  \_\_\_\_\_ BMM = \_\_\_\_\_

d. FM:

FM = \_\_\_\_\_

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Community : \_\_\_\_\_

**450 STORMWATER MANAGEMENT**

**451 Credit Points:**

- a. SMR
  - 1. SZ SZ = \_\_\_\_\_
  - 2. DS DS = \_\_\_\_\_
  - 3. PUB PUB = \_\_\_\_\_

SMR = the total of lines 1 through 3: SMR = \_\_\_\_\_
- b. WMP
  - 1. The four prerequisites are met (80 points): \_\_\_\_\_
  - 2. The plan is also based on the 100-year storm (25 points): \_\_\_\_\_
  - 3. The community also manages peaks and volumes (40 points): \_\_\_\_\_
  - 4. The community uses the 5-day event (25 points): \_\_\_\_\_
  - 5. Identification of wetlands, etc. (15 points): \_\_\_\_\_
  - 6. Protection of natural channels (10 points): \_\_\_\_\_
  - 7. Requiring “soft” techniques for bank stabilization (10 points): \_\_\_\_\_
  - 8. Coordination with the floodplain management plan (20 points): \_\_\_\_\_

WMP = the total of lines 1 through 8: WMP = \_\_\_\_\_

**452 Impact Adjustment:**

- a. Option 1: 1. rSMR = 1.0      2. rWMP = 1.0
- b. Option 2: 1. rSMR = 0.25      2. rWMP = 0.25
- c. Option 3: 1.  $rSMR = \frac{aSMR}{aW} = \frac{\quad}{\quad}$       2.  $rWMP = \frac{aWMP}{aW} = \frac{\quad}{\quad}$

**453 Credit Calculation:**

- a.  $cSMR = SMR \times rSMR$  cSMR = \_\_\_\_\_
  - b.  $cWMP = WMP \times rWMP$  cWMP = \_\_\_\_\_
  - c.  $FRX = \quad \times \quad$  height in feet of lowest floor or opening, OR  
     50, where site plan accounts for drainage, OR  
     20, where positive drainage required FRX = \_\_\_\_\_
  - d. ESC ESC = \_\_\_\_\_
  - e. WQ WQ = \_\_\_\_\_
- Add the lines a—e above = \_\_\_\_\_
- c450 = value above rounded to the nearest whole number: c450 = \_\_\_\_\_
- Enter this value on AW-720-1.

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Community : \_\_\_\_\_

**454 Credit Documentation:**

a. Stormwater Management Regulation (SMR):

- 1. A copy of the ordinance or law language regulating surface water runoff from new developments in the watershed. For SMR credit, the language must require that peak runoff from new developments be no greater than the runoff from the site in its pre-development condition. As an alternative to such a performance standard, the language may be based on criteria designed to produce the same result on a regional basis (e.g., a standard allowable discharge per acre based on a regional study). The margin next to where this appears in the ordinance must be marked "SMR."
  - Ordinance language from other communities within the watershed with the same or similar regulations. The margin next to where this appears in the ordinance must be marked "SMR," OR
  - Written assurance from a county, regional, or state agency that similar standards are in effect in the upstream communities.
  - Development and permit records that demonstrate enforcement.
- 2. SZ: The ordinance language that includes the types of development regulated to ensure that peak runoff from new developments be no greater than the runoff from the site in its pre-development condition. Include the part of the ordinance that specifies exemptions to this requirement. The margin next to where this appears in the ordinance must be marked "SZ."
  - Ordinance language from other communities within the watershed with the same or similar regulations. The margin next to where this appears in the ordinance must be marked "SZ," OR.
  - Provide written assurance from a county, regional, or state agency that similar standards are in effect in the upstream communities.
- 3. DS: The ordinance language that includes the design storm(s) used by the community for stormwater management regulation. This is the recurrence interval for the storm(s) that is/are regulated to prevent increased runoff due to development. If credit is based on language that does not include storm recurrence intervals, the community must provide an estimate of the recurrence intervals. The margin next to where this appears in the ordinance must be marked "DS."
  - Ordinance language from upstream communities within the watershed with the same or similar regulations. The margin next to where this appears in the ordinance must be marked "DS." OR
  - Provide written assurance from a county, regional, or state agency that similar standards are in effect in the upstream communities.
- 4. PUB: The ordinance language that shows that the community has the authority to inspect all private and public stormwater facilities and ensure that they are properly maintained. The margin next to where this appears in the ordinance must be marked "PUB."
  - Ordinance language that requires that all stormwater facilities be dedicated to the community." OR
  - Ordinance language that allows community staff to enter private property to inspect stormwater facilities, AND allows community staff to perform necessary maintenance." OR
  - Ordinance language that requires the owner(s) of private stormwater facilities to have them inspected at least annually by a registered engineer, to perform all maintenance indicated by such inspections, and to submit copies of all inspection reports and maintenance reports to the community.



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Community : \_\_\_\_\_

- \_\_\_ A list or map that shows the locations of all publicly and privately owned stormwater facilities for which the community is requesting PUB credit.
- \_\_\_ Documentation that shows that all public and private stormwater facilities have been inspected at least annually. This documentation should include a standard operating procedure for inspections and records of actual inspections and maintenance. This documentation is similar to, and may be combined with, documentation for channel debris removal (CDR) in Activity 540.

5. Impact adjustment. EITHER

- \_\_\_ If the community uses Option 1, it must document that all of the watershed that affects the community is regulated to the same standard. This is true if there is a regional stormwater management standard applied by all upstream communities, or if the community is entirely on an island, and no other communities on the island drain into the community, or if the community's upstream boundaries exactly match the watershed boundaries. Provide an Impact Adjustment Map that shows the area regulated by the community (usually the community's boundaries) (marked "aSMR") and the boundaries of the watershed that affects the community (marked "aW"). aSMR and aW must be equal. OR
- \_\_\_ If the community uses Option 2, rSMR = 0.25 and no documentation is required. OR
- \_\_\_ If the community uses Option 3, it must provide an Impact Adjustment Map. Provide an Impact Adjustment Map that shows the area regulated by the community (usually the community's boundaries) (marked "aSMR") and the boundaries of the watershed that affects the community (marked "aW"). If areas within the upstream watershed are regulated by other communities, their boundaries must also be marked.

b. Watershed Master Plan (WMP):

1. WMP Prerequisites (one prerequisite is credit for SMR):

- \_\_\_ a. Documentation that the community has adopted a watershed management master plan for one or more of the watersheds that drain into the community. The margin next to where this appears in the documentation must be marked "WMP 1.a."
- \_\_\_ c. The section of the plan that includes regulatory standards to manage future peak flows so that they do not increase over present values. The margin next to where this appears in the documentation must be marked "WMP 1.c."
- \_\_\_ d. The section of the plan that includes regulatory standards to manage runoff from all storms up to and including at least the 25-year event. The margin next to where this appears in the documentation must be marked "WMP 1.c."

2. WMP Credit (Basic credit is provided for meeting the prerequisites):

- \_\_\_ b. Documentation that shows management of peak flows for all storms up to and including the 100-year storm. The margin next to where this appears in the documentation must be marked "WMP 2.b."
- \_\_\_ c. Documentation that shows management of peak flows AND volumes so that they do not exceed present values. The plan must include either regulations that meet these criteria, or must be based on a rainfall/runoff model that achieves these results. The margin next to where this appears in the documentation must be marked "WMP 2.c."

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Community : \_\_\_\_\_

- \_\_\_ d. Documentation that shows management of the runoff from all storms up to and including the 5-day event. If a community can demonstrate that an event shorter than five days is the locally appropriate “worst-case” runoff event for stormwater management, it may receive the credit if it uses that event for its regulatory standard. The margin next to where this appears in the documentation must be marked “WMP 2.d.”
  - \_\_\_ e. Documentation that the plan identifies existing wetlands or other natural open space areas to be preserved from development to provide natural attenuation, retention, or detention of runoff. The margin next to where this appears in the documentation must be marked “WMP 2.e.”
  - \_\_\_ f. Documentation that the plan prohibits development, alteration, or modification of existing natural channels. The margin next to where this appears in the documentation must be marked “WMP 2.f.”
  - \_\_\_ g. Documentation that the plan requires that channel improvement projects use natural or “soft” approaches rather than gabions, riprap, concrete, or other “hard” techniques. The margin next to where this appears in the documentation must be marked “WMP 2.g.”
  - \_\_\_ h. Documentation that the plan was prepared in coordination with or as a part of the community's floodplain management plan credited under Activity 510. The margin next to where this appears in the documentation must be marked “WMP 2.h.” EITHER
  - \_\_\_ The Floodplain Management Plan is mentioned prominently in the stormwater master plan and references in the watershed master plan demonstrate that it is intended to help implement the Floodplain Management Plan. OR
  - \_\_\_ Hydrologic output from the watershed master plan is used as input for the Floodplain Management Plan.
3. Impact adjustment. Either:
- \_\_\_ If the community uses Option 1, it must document that all of the watershed that affects the community is covered by its watershed master plan(s). This is true if there is a regional stormwater management plan applied by all upstream communities, or if the community is entirely on an island, and no other communities on the island drain into the community, or if the community's upstream boundaries exactly match the watershed boundaries. Provide an Impact Adjustment Map that shows the area covered by the watershed master plan(s) (marked “aWMP”) and the boundaries of the watershed that affects the community (marked “aW”). aWMP and aW must be equal. OR
  - \_\_\_ If the community uses Option 2, rWMP = 0.25 and no documentation is required. OR
  - \_\_\_ If the community uses Option 3, it must provide an Impact Adjustment Map. Provide an Impact Adjustment map that shows the area covered by the watershed master plan(s) (marked “aWMP”) and the boundaries of the watershed that affects the community (marked “aW”).
- c. Freeboard in B, C, D, and X Zones (FRX):
- \_\_\_ A copy of the ordinance or law language that requires elevation of the lowest floor or lowest opening of new buildings. The margin next to where this appears in the documentation must be marked “FRX.”
  - \_\_\_ Development and building permit records that demonstrate enforcement.

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Community : \_\_\_\_\_

d. Erosion and sedimentation control regulations (ESC):

- \_\_\_ A copy of the ordinance or law language that requires developers or property owners to use techniques that prevent erosion and soil loss from exposed land. The ordinance(s) or law must designate an office or official responsible for receiving complaints and monitoring compliance and it must include enforcement and abatement provisions. The margin next to where this appears in the documentation must be marked "ESC."
- \_\_\_ Development and building permit records that demonstrate enforcement.

e. Water quality regulations (WQ):

- \_\_\_ A copy of the ordinance or law language that requires new developments to implement appropriate best management practices to improve water quality. The margin next to where this appears in the documentation must be marked "WQ."
- \_\_\_ Development and building permit records that demonstrate enforcement.

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To facilitate verification of this activity, please provide the names of the CRS Coordinator and local stormwater manager if other than the CRS Coordinator:

	CRS Coordinator	Local Stormwater Manager
Name:	_____	_____
Title:	_____	_____
Phone:	_____ Fax: _____	_____ Fax: _____
Address:	_____	_____
	_____	_____
E-mail:	_____	_____

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Comments:

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Community : \_\_\_\_\_

## REPETITIVE LOSS REQUIREMENTS

### 501 Repetitive Loss List:

- The community has reviewed the repetitive loss list dated \_\_\_\_\_, 200\_\_\_\_, and  
 Attached are updated Repetitive Loss Update Worksheets, AW-501. OR  
 There are no changes to FEMA's repetitive loss list.

As the current CRS Coordinator for \_\_\_\_\_[community name], I have examined the repetitive loss data provided for each of our \_\_\_\_\_[#] assigned repetitive loss properties. For each property in need of update, I have attached an AW-501 that reflects the current and accurate address, the correct NFIP community identification number, and all known mitigation actions with the primary source of funding noted. In addition, to the best of my knowledge and belief, any AW-501 not updated and submitted as part of this application has been checked and is not in need of update at this time.

Signature: \_\_\_\_\_ (Community CRS Coordinator)

### 502 Repetitive Loss Category:

- After updating, the number of properties counted for CRS purposes is:\_\_\_\_ This community is a:  
 Category A community because it has removed all properties from being counted as repetitive loss properties for CRS purposes.  
 Category B community with 1 to 9 properties counted for CRS purposes. OR  
 Category C community with 10 or more properties counted for CRS purposes.

**NOTE:** ALL CATEGORY B AND C REPETITIVE LOSS COMMUNITIES MUST COMPLETE THE FOLLOWING SECTION 503 AND SUBMIT THE ACCOMPANYING DOCUMENTATION. CATEGORY C COMMUNITIES MUST ALSO RECEIVE CREDIT FOR A FLOODPLAIN MANAGEMENT PLAN UNDER ACTIVITY 510 (FLOODPLAIN MANAGEMENT PLANNING). A CATEGORY C COMMUNITY WILL REVERT TO CLASS 10 IF IT FAILS TO SUBMIT A PLAN.

### 503 Repetitive Loss Area Outreach Project:

- a. A description of the causes of the repetitive flooding.  
 b. A map with the repetitive loss areas identified.  
 c. The addresses for all the properties in the repetitive loss areas.  
 d. The number of buildings in the repetitive loss areas is: \_\_\_\_\_ (= bRLA).  
 e. The outreach project sent to all properties in the repetitive loss areas.

### The following will be needed at the annual recertification:

- The outreach project sent to all properties in the repetitive loss areas.



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Community : \_\_\_\_\_

To facilitate verification of this activity, please provide the names of the CRS Coordinator and local repetitive loss contact person, if other than the CRS Coordinator:

	CRS Coordinator	Repetitive Loss Contact
Name:	_____	_____
Title:	_____	_____
Phone:	_____ Fax: _____	_____ Fax: _____
Address:	_____	_____
	_____	_____
E-mail:	_____	_____

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Comments:

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Community : \_\_\_\_\_

## 510 FLOODPLAIN MANAGEMENT PLANNING

### 511.a Floodplain Management Planning (FMP)

**Credit Points:** Enter the section or page number in the plan where each credited item can be found.

CRS Step	Section/Page	Item Score	Step Total
1. Organize to prepare the plan.			
a. Supervision or direction of a professional planner (2)			
b. Planning committee of department staff (6)			
c. Process formally created by the community's governing board (2)			
2. Involve the public.			
a. Planning process conducted through a planning committee (40)			
b. Public meetings held at the beginning of the planning process (15)			
c. Public meeting held on draft plan (15)			
d. Questionnaires ask the public for information (5)			
e. Recommendations are solicited from advisory groups, etc. (5)			
f. Other public information activities to encourage input (5)			
3. Coordinate with other agencies.			
a. Review of existing studies and plans (REQUIRED) (3)			
b. Invited neighboring communities and other agencies (REQUIRED) (1)			
c. Contacted communities and NFIP and EM agencies (4)			
d. NWS, ARC and others are asked how they can help community (4)			
e. Meetings are held with agencies on mitigation strategies (10)			
f. Draft action plan sent to agencies for comments (3)			
4. Assess the hazard.			
a. Plan includes an assessment of the flood hazard (REQUIRED) with:			
(1) A map of known flood hazards (5)			
(2) A description of known flood hazard (5)			
(3) A discussion of past floods (5)			
b. The plan describes other natural hazards (REQUIRED FOR DMA) (5)			

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AW-214	Recertification Worksheet	AW-CE	Coastal Erosion Hazards
AW-230	Modification/Cycle Cover Page	AW-DB	Dunes and Beaches
		AW-IJ	Ice Jam Hazards
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Community : \_\_\_\_\_

CRS Step	Section/Page	Score	Total
5. Assess the problem.			
a. Summary of each hazard identified in the hazard assessment and their community impact (REQUIRED) (2)			
b. Description of the impact of the hazards on:			
(1) Life, safety, health, procedures for warning and evacuation (5)			
(2) Critical facilities and infrastructure (5)			
(3) The community's economy and tax base (5)			
c. Number and types of buildings subject to the hazards (5)			
d. Review of all flood insurance claims (4)			
e. Natural and beneficial functions (4)			
f. Development, redevelopment, and population trends (5)			
6. Set goals. (REQUIRED) (2)			
7. Review possible activities.			
a. Preventive activities (5)			
b. Property protection activities (5)			
c. Natural resource protection activities (5)			
d. Emergency services activities (5)			
e. Structural projects (5)			
f. Public information activities (5)			
8. Draft an action plan.			
Actions must be prioritized (REQUIRED)			
a. Recommendations for activities from two of the six categories (10)			
b. Recommendations for activities from three of the six categories (20)			
c. Recommendations for activities from four of the six categories (30)			
d. Recommendations for activities from five of the six categories (45)			
e. Post-disaster mitigation policies and procedures (10)			
f. Recommendations from Habitat Conservation Plan (10)			
g. Action items for mitigation of other hazards (5)			

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AW-430LD	Land Development Criteria
AW-440	Flood Data Maintenance
AW-450	Stormwater Management
AW-501	Repetitive Loss List
AW-502	Repetitive Loss Requirements
AW-510	Floodplain Management Planning
AW-520	Acquisition and Relocation
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AW-720m	Community Credit Calculations (Modification)

**Activity Worksheet No. Title**

AW-CB	Closed Basin Lake Hazards
AW-CE	Coastal Erosion Hazards
AW-DB	Dunes and Beaches
AW-IJ	Ice Jam Hazards
AW-MF	Mudflow Hazards
AW-SU	Land Subsidence Hazards
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Community : \_\_\_\_\_

CRS Step	Section/Page	Score	Total
9. Adopt the plan. (2)			
10. Implement, evaluate and revise.			
a. Procedures to monitor and recommend revisions (REQUIRED) (2)			
b. Same planning committee or successor committee that qualifies under Section 511.a.2(a) does the evaluation (13)			

Add the totals for steps 1 through 10 above:

FMP= \_\_\_\_\_

**514 Credit Documentation:**

- \_\_\_ a. FMP: The completed CRS activity worksheet (AW-510-1–510-3) or the mitigation plan review crosswalk.
- \_\_\_ b. A copy of the floodplain management plan, hazard mitigation plan, and/or Habitat Conservation Plan.
- \_\_\_ c. Documentation showing how the public was involved in preparing or reviewing the plan, including a copy of the notice(s) advising residents about the public meeting(s) held pursuant to steps 2(b) and (c), and a record of the meeting(s).
- \_\_\_ d. Copies of correspondence, meeting notes, or other materials that document the coordination with other municipalities, agencies, and organizations credited under Sections 511.a.3(b) – (f).
- \_\_\_ e. Documentation showing that the plan was adopted by the community’s governing board.

**The following will be needed at the annual recertification:**

- \_\_\_ g. An annual report on evaluating progress toward implementing the action plan’s objectives.

**The following will be needed at least every five years:**

- \_\_\_ h. An update to the floodplain management or hazard mitigation plan.



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Community : \_\_\_\_\_

### 511.b Repetitive Loss Area Analysis (RLAA) Credit Points:

Complete one copy of this page for each analysis.

- \_\_\_ 1. Show that all repetitive loss areas are mapped as described in Section 503.b.
- \_\_\_ 2. Upon request, provide the data collected on each building in the area(s) using the “limited data view” of the National Flood Mitigation Data Collection Tool.
- \_\_\_ 3. Enter the section or page number in the analysis where each credited item can be found.
  - \_\_\_ Step 1. Property owners were advised that the analysis would be conducted.
  - \_\_\_ Step 2. Data were collected on each building and the cause(s) of the repetitive flood damage was determined.
  - \_\_\_ Step 3. Alternative mitigation approaches were reviewed to determine whether any property protection measures or drainage improvements are feasible.
  - \_\_\_ Step 4. Agencies or organizations that may have plans that could affect the cause or impacts of the flooding were contacted.
  - \_\_\_ Step 5. Document the findings, including a map showing all parcels in the area, recommendations, and how the recommendations will be funded.
- \_\_\_ 4. A memo or other documentation showing that the head of the appropriate department has approved the analysis.
  - \_\_\_ If the community did not conduct analyses of all the repetitive loss areas, provide the following:
    - a. The number of buildings in the repetitive loss areas where the analyses have been completed (bAA) \_\_\_\_\_.
    - b. The number of buildings in all of the community’s repetitive loss areas (bRLA) \_\_\_\_\_.

### 514 Credit Documentation:

- \_\_\_ RLAA: The completed CRS activity worksheet (AW-510-4) for each analysis.
- \_\_\_ e. A copy of each repetitive loss area analysis to be credited and a memo or other documentation showing that the head of the appropriate department has approved it. The National Flood Mitigation Data Collection Tool database file must also be provided, if requested.

### The following will be needed at the annual recertification:

- \_\_\_ f. An annual report on evaluating progress toward implementing the action plan’s objectives and/or the recommendations of the area analyses. A single report may be prepared for all analyses.

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AW-360 Flood Protection Assistance

AW-410 Additional Flood Data  
AW-420 Open Space Preservation  
AW-430 Higher Regulatory Standards  
AW-430LD Land Development Criteria  
AW-440 Flood Data Maintenance  
AW-450 Stormwater Management

AW-501 Repetitive Loss List  
AW-502 Repetitive Loss Requirements  
AW-510 Floodplain Management Planning  
AW-520 Acquisition and Relocation  
AW-530 Flood Protection  
AW-540 Drainage System Maintenance

AW-610 Flood Warning Program  
AW-620 Levee Safety  
AW-630 Dam Safety

AW-710 Community Growth Adjustment  
AW-720 Community Credit Calculations  
AW-720m Community Credit Calculations (Modification)

**Activity Worksheet No. Title**

AW-CB Closed Basin Lake Hazards  
AW-CE Coastal Erosion Hazards  
AW-DB Dunes and Beaches  
AW-IJ Ice Jam Hazards  
AW-MF Mudflow Hazards  
AW-SU Land Subsidence Hazards  
AW-TS Tsunami Hazards  
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OMB No. 1660-0022  
Expires: June 30, 2010

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Community : \_\_\_\_\_

## 520 ACQUISITION AND RELOCATION

### 522 Impact Adjustment:

a. Option 1:  $(bAR \text{ _____} \times 5) + (bRL \text{ _____} \times 10) + (bSRL \text{ _____} \times 15) = \text{_____}$ . Under Option 1, the maximum value for bAR, bRL or bSRL is 20. The maximum credit for c520 under Option 1 is 300.

b. Option 2:  $rAR = \frac{100 \times (bAR \text{ _____} + (2 \times bRL \text{ _____}) + (3 \times bSRL \text{ _____}))}{bSF \text{ _____} + bAR \text{ _____} + bRL \text{ _____} + bSRL \text{ _____}} = \text{_____}$

rAR cannot be greater than 100.0.

### 523 Credit Calculation:

a. Option 1:  $c520 = (bAR \text{ _____} \times 5) + (bRL \text{ _____} \times 10) + (bSRL \text{ _____} \times 15) = \text{_____}$

b. Option 2:  $c520 = 32 \times rAR \text{ _____} = \text{_____}$

c520 = value above rounded to the nearest whole number: c520 = \_\_\_\_\_

Enter this value on AW-720-1.

### 524 Credit Documentation:

- \_\_\_ a. A map showing the location of parcels where buildings have been demolished or relocated since the effective date of the FIRM and the total number of such buildings.
- \_\_\_ b. Documentation showing that each site credited can also qualify for credit as preserved open space.
- \_\_\_ c. Impact Adjustment Option 2 – Calculations showing the number of buildings in the SFHA (bSF).
- \_\_\_ d. Real estate or permit records that document the date of removal of each building.
- \_\_\_ e. Either the non-repetitive loss buildings (bAR) are \_\_\_ located within the SFHA OR \_\_\_ outside the SFHA and documentation is attached showing that floodplain regulations are in effect in the area outside the SFHA.

### 504 National Flood Insurance Reform Act of 1994:

\_\_\_ No projects with CRS credit were funded with Flood Mitigation Assistance Program Funds.

\_\_\_ Flood Mitigation Assistance Program Funds were used to finance the acquisition and relocation of \_\_\_ buildings which are on the list of buildings for CRS credit.

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Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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Community : \_\_\_\_\_

### 530 FLOOD PROTECTION

#### 532 Impact Adjustment:

a. Option 1.

Number of protected non-repetitive loss buildings in the regulatory floodplain: \_\_\_\_\_

Number of protected non-Severe Repetitive Loss buildings \_\_\_\_ x 2 = \_\_\_\_\_

Number of protected Severe Repetitive Loss buildings \_\_\_\_ x 3 = \_\_\_\_\_

Add the above lines \_\_\_\_\_

rPB = 0.15 x the total of the above \_\_\_\_\_ = \_\_\_\_\_

b. Option 2.  $rPB = \frac{100 \times PB}{bSF}$  \_\_\_\_\_ = \_\_\_\_\_

#### 533 Credit Calculation:

28 x rPB \_\_\_\_\_ = \_\_\_\_\_

c530 = value above rounded to the nearest whole number: c530 = \_\_\_\_\_

Enter this value on AW-720-1.

#### 534 Credit Documentation:

\_\_\_ a. and b. Elevation certificates, completed AW-530-3, or other documentation that shows that each protection project meets this activity's prerequisites and shows the type of protection measure and protection level for each retrofitted building.

\_\_\_ c. A map showing the location of all protected buildings for which credit is being applied.

\_\_\_ d. Impact Adjustment Option 2 – Calculations showing the number of buildings in the SFHA (bSF).

\_\_\_ e. Either the non-repetitive loss protected buildings are \_\_\_\_\_ located within the SFHA OR \_\_\_\_\_ outside the SFHA and documentation is attached showing that floodplain regulations are in effect in the area outside the SFHA.

#### 504 National Flood Insurance Reform Act of 1994:

\_\_\_ No projects with CRS credit were funded with Flood Mitigation Assistance program funds.

\_\_\_ Flood Mitigation Assistance program funds were used to finance the protection of \_\_\_\_\_ buildings which are on the list of buildings for CRS credit.

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Comments:

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Community : \_\_\_\_\_

## RETROFITTING WORKSHEET

*This is an optional form that may be used to record CRS credit criteria for retrofitting projects that are not in a high hazard area and that do not need to be designed or approved by an engineer or architect. Elevated buildings should be documented with a FEMA elevation certificate.*

**Property Address:** \_\_\_\_\_  
\_\_\_\_\_

**Permit record.** EITHER Permit # \_\_\_\_\_ Date of Permit: \_\_\_\_\_  
OR

\_\_\_ The project meets all requirements of the regulations currently in effect.

\_\_\_ The project was completed after the effective date of the initial FIRM.

### **Building/project condition.**

\_\_\_ The building or project appears to be maintained.

### **Human intervention.** EITHER:

\_\_\_ The project does not require human intervention. OR

\_\_\_ The project requires human intervention and there is adequate warning time.

Approximate duration of flood events: \_\_\_\_\_ hours/days.

### **High hazard area.** EITHER:

\_\_\_ The building is NOT located in a V Zone, floodway with velocity > 5 feet per second, or an area subject to special hazard. OR

\_\_\_ The building is located in one of the high hazard areas and the design was certified by a licensed professional engineer or architect.

### **Dry floodproofing.**

\_\_\_ The project was designed by an engineer and the design accounts for interior drainage, seepage, and underdrainage. (TU = 0.6)

\_\_\_ The project does not depend on human intervention to close openings; the project protects to a level less than 3 feet over the first floor; the design accounts for internal drainage, seepage, and underdrainage; and the building does not have a basement. (TU = 0.4)

\_\_\_ There is no documentation of how openings, internal drainage, seepage, or underdrainage are handled. (TU = 0.2)

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Community : \_\_\_\_\_

**Wet floodproofing.**

- The project was designed by a licensed engineer or architect. (TU = 0.5)
- The project was not designed by a licensed engineer or architect. (TU = 0.3)
- The furnace, water heater, electrical breaker box, and other utilities are relocated above flood level. (TU = 0.2)

**Sewer backup protection.**

- The building is located in the SFHA. (TU = 0.2)
- The building is located outside of the SFHA and the community has a building code or other regulations that require positive drain sewers or other measures that prevent sewer backup into new buildings. (TU = 0.1)

**Flood protection improvement (FPI).**

Before the retrofitting project, the building was protected from the \_\_\_\_\_-year flood    FPB = \_\_\_\_\_

After the retrofitting project, the building was protected from the \_\_\_\_\_-year flood    FPP = \_\_\_\_\_

The values for FPB and FPP are:

- 0.0 for protection to less than the 10-year flood
- 0.3 for protection to the 10-year flood, but less than the 25-year flood
- 0.5 for protection to the 25-year flood, but less than the 50-year flood
- 0.8 for protection to the 50-year flood, but less than the 100-year flood
- 0.9 for protection to the 100-year flood
- 1.0 for protection to the 100-year plus one foot or more
- 1.0 for protection to the 500-year flood

Source of flood recurrence interval if other than FIS: \_\_\_\_\_

CRS scores: TU = \_\_\_\_\_    FPB = \_\_\_\_\_    FPP = \_\_\_\_\_

This property is on the FEMA repetitive loss list.

This property is on the FEMA Severe Repetitive Loss list.

I certify that the items checked above are correct to the best of my knowledge.

Name (signed): \_\_\_\_\_

Name (printed): \_\_\_\_\_ Date: \_\_\_\_\_

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Community : \_\_\_\_\_

## 540 DRAINAGE SYSTEM MAINTENANCE

### 541 Credit Points:

- a. CDR
1. 200, if the program includes all four requirements: \_\_\_\_\_
  2. 50, if there are measures for specific problem sites: \_\_\_\_\_
  3. 50, if there is a capital improvement program: \_\_\_\_\_
- CDR = the total of lines 1 through 3 above: CDR = \_\_\_\_\_

### 542 Impact Adjustment:

- a. Option 1: rCDR = 1.0
- b. Option 2: rCDR = 0.2
- c. Option 3: rCDR =  $\frac{aCDR}{aDC}$  \_\_\_\_\_ = \_\_\_\_\_

### 543 Credit Calculation:

- a. cCDR = CDR \_\_\_\_\_ x rCDR \_\_\_\_\_ cCDR = \_\_\_\_\_
- b. SDR SDR = \_\_\_\_\_
- c. cEPM (from AW-CE) cEPM = \_\_\_\_\_
- Add the lines above = \_\_\_\_\_
- c540 = above rounded to nearest whole number: c540 = \_\_\_\_\_
- Enter this value on AW-720-1.

### 544 Credit Documentation:

- a. CDR: Drainage inspection and maintenance procedures, instructions, or other documents that explain the community's routine inspection and debris removal program:

- \_\_\_ 1. Identification of the person or position responsible for the various aspects of the maintenance program;
- \_\_\_ 2. Description of the community's drainage system and areas subject to the maintenance program;
- \_\_\_ 3. Explanation of the procedures for inspection, including when regular inspections are conducted and how soon inspections are conducted after a complaint or a storm;
- \_\_\_ 4. Explanation of the debris removal procedures, i.e., how soon after an inspection an area must be cleared and what can and cannot be removed; and
- \_\_\_ 5. Samples of records that are kept to document both the inspections and the removal projects.

\_\_\_ If the community is requesting credit for special inspection and maintenance of problem sites (Section 431.a.2), attach a master list of the community's drainage maintenance problem sites that are inspected and maintained differently or more frequently. The problem sites must be part of the drainage system that the community has mapped for its CDR credit.



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Community : \_\_\_\_\_

b. CDR: Capital improvement program: If the community is requesting credit for an ongoing program, such as a capital improvements plan, to eliminate or correct problem sites or to construct "low maintenance" channels or other facilities (Section 431.a.3):

- \_\_\_ 1. A master list of the community's drainage maintenance problem sites that are in need of elimination or correction. The problem sites must be part of the drainage system that the community has mapped for its CDR credit.
- \_\_\_ 2. Recommended correction measures for the problem sites.
- \_\_\_ 3. Documentation that funds are spent on improvement projects each year.

c. SDR: Stream dumping regulations:

\_\_\_ A copy of the regulatory language that prohibits dumping in the community's drainage system. The ordinance or law must designate an office or official responsible for receiving complaints and monitoring compliance and it must include enforcement and abatement provisions. Mark this documentation "SDR."

d. SDR: Stream dumping regulations publicity – EITHER

- \_\_\_ A copy of the outreach project. OR
- \_\_\_ Photographs of "no dumping" signs.

e. CDR: Impact Adjustment Map:

\_\_\_ A map showing all parts of the surface drainage system in the developed areas of the community and showing those parts that are inspected and maintained under CDR.

f. CDR: Records:

\_\_\_ Copies of inspection and maintenance records.

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Comments:

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Community : \_\_\_\_\_

## 610 FLOOD WARNING PROGRAM

### 611 Credit Points:

- a. 2. Flood threat recognition system (FTR):
- (a) (1) Act on NWS warning (20 points): \_\_\_\_\_
  - (2) Prediction model (5 or 20 points): \_\_\_\_\_
  - (b) (1) Data collection (15 or 20 points): \_\_\_\_\_
  - (2) Gage density (10 points): \_\_\_\_\_
  - (3) Prediction model (5 or 10 points): \_\_\_\_\_
- FTR = the total of (a)(1) and (2) OR (b)(1) through (b)(3) above: FTR = \_\_\_\_\_
- b. 2. Emergency warning dissemination (EWD):
- (a) Adopted policy (10 points): \_\_\_\_\_
  - (b) Outdoor system (15 points): \_\_\_\_\_
  - (c) Door to door (30 points): \_\_\_\_\_
  - (d) Emergency Alert System (10 points): \_\_\_\_\_
  - (e) Telephone (15 points): \_\_\_\_\_
  - (f) Cable TV override (10 points): \_\_\_\_\_
  - (g) AM transmitters (10 points): \_\_\_\_\_
  - (h) Other system: \_\_\_\_\_
- EWD = the total of (a) through (h) above.  
If the total is greater than 60, then EWD = 60.: EWD = \_\_\_\_\_
- c. 2. Other response efforts (ORE):
- (a) Plan keyed to predicted flood levels (20 points): \_\_\_\_\_
  - (b) Plan assigns tasks (10 points): \_\_\_\_\_
  - (c) Plan identifies resources needed (20 points): \_\_\_\_\_
- ORE = the total of (a) through (c) above: ORE = \_\_\_\_\_
- d. 2. Critical facilities planning (CFP):
- (a) CFP1 Names and numbers (10 points): CFP1 = \_\_\_\_\_
  - (b) CFP2 Warning coordination (20 points): CFP2 = \_\_\_\_\_
  - (c) CFP3 Facilities have own plans (20 points): CFP3 = \_\_\_\_\_
- e. SRC SRC = \_\_\_\_\_

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Community : \_\_\_\_\_

## 614 Credit Documentation:

*Note: If Activity 610 credit has been received before and there is no change in the flood warning program and/or the emergency operations plan, go to page AW-610-5.*

### Flood Threat Recognition System (FTR):

1. Provide a description of the local flood hazards. *[Include sources of flooding, areas affected and impact of flooding on the community.] [See Attachment \_\_\_\_ pages \_\_\_\_\_.]*

If the community does NOT HAVE a description of its flood hazards, FTR=0 and c610=0.

2. Provide a description of the Flood Threat Recognition System. *[Include documentation of early notice of a flood at one or more locations within the community. If appropriate, describe show how the community provides flood forecasts for areas other than the above forecast points.] [See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
3. If the community or another local agency use rainfall and/or runoff data on a real-time basis and makes flood forecasts from these data, provide a description of the system. *[Tell whether the collection system is based on precipitation and/or river gage data that are manually or automatically read and reported, the location gage network density, etc.] [See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
4. Provide documentation showing the method used to predict downstream arrival time and peak flow or elevations. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
5. If flood warnings are received from another agency,
  - Include a description of how the notice is received. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
  - Identify local agency procedures for monitoring the system. *[Include the written instructions available to the person monitoring the warning system.] [See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
6. Provide examples of one or more flood forecast notices issued for the community. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
7. Provide documentation of the annual maintenance and testing of the data collection, communications, and data analysis components of the flood threat recognition system. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*

### Emergency Warning Dissemination (EWD):

8. Provide documentation that the local government has adopted an emergency response plan. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
9. Describe the community's program for testing warning dissemination equipment and procedures. *[Include the frequency of the test.] [See Attachment \_\_\_\_ pages \_\_\_\_\_.]*



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Community : \_\_\_\_\_

10. Provide a copy of the adopted policy that specifies when and how a warning is issued. *[Include the written procedures that tell warning point personnel when, how and what messages to issue.] [See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
11. If the community uses either a sound or siren system to disseminate flood warnings, provide a map showing the location of the sirens and the coverage area where they can be heard inside a closed building during storm conditions. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
12. If the community uses door-to-door contact or a mobile public address system for flood warning, provided documentation describing how the tasks are organized and conducted. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
13. If the community's response plan includes flood warning using the Emergency Alert System, provide a copy of the community's activation policies, procedures, and example messages. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
14. If a telephonic system is used to warn all residents in the SFHA, provide documentation describing how and when the system is updated, and its backup system for warning residents when there is no telephone answer provided. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
15. If the community uses a cable television override system for flood warning, provide documentation of its procedures for activating the system. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
16. If the community has established local AM radio transmitters used for public warning announcements, provide documentation on the procedures for their use. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
17. If the community has other warning methods not described above, these may be submitted for credit evaluation. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*

**Other Response Efforts (ORE):**

18. Provide a copy of those sections of the local emergency operations plan, flood response plan, standard operating procedures and other documentation that show how the local government responds to floods. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*

**Critical Facilities Planning (CFP):**

19. If the community maintains the names and telephone numbers of the operators of ALL critical facilities affected by flooding, provide documentation that this information is updated at least annually. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
20. If the community provides special flood warnings or early notifications directly to ALL facilities that need them, provide a copy of the section of the adopted plan that describes these arrangements and how they are implemented. *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*
21. Provide a list of critical facilities that need flood response plans. Identify those critical facilities with flood response plans that have been developed, reviewed, or accepted by the community. **[NOTE: The local government may be asked to provide one or more of the plans on the list to the technical reviewer.]** *[See Attachment \_\_\_\_ pages \_\_\_\_\_.]*

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Community : \_\_\_\_\_

### Cycle verification of previously credited flood warning program

22. What is the date of the current flood warning program (Emergency Operations Plan)?  
\_\_\_\_\_ *If this date is more recent than the date of the plan used for the previous verification, obtain a copy of those portions related to flood warning and flood operations. Send these materials for technical review. [See Attachment \_\_\_\_.]*

23. Has there been a flood insurance restudy since the last verification? \_\_\_\_Yes \_\_\_\_No

A. If yes, did the new Flood Insurance Study add streams to the SFHA?  
\_\_\_\_Yes \_\_\_\_No *If yes, mark these on the FIRM and send for review. [See Attachment \_\_\_\_.]*

B. Have these new streams been included in the flood warning program?  
\_\_\_\_ Yes. Provide a description of the flood threat recognition system for these areas. Tell how many SFHA buildings are covered by the expanded warning area. *[See Attachment \_\_\_\_.]*

\_\_\_\_ No. What percentage of the SFHA buildings are located in the area not covered by flood forecast with peak flow or elevation data? \_\_\_\_\_

24. Has there been a flood since the last verification that resulted in the loss of life or \$50,000 in damage? \_\_\_\_Yes \_\_\_\_No

A. Was a flood warning evaluation report prepared? \_\_\_\_Yes \_\_\_\_No *If yes, attach a copy of the report to this form. [See Attachment \_\_\_\_.]*

B. Were changes made to the flood warning program as a result of the evaluation report?  
\_\_\_\_Yes \_\_\_\_No *If yes, attach a copy of the changes to this form. [See Attachment \_\_\_\_.]*

25. Has the flood warning program been modified since the last verification for other reasons?  
\_\_\_\_Yes \_\_\_\_No *If yes, attach a copy of the changes to this form. [See Attachment \_\_\_\_.]*

26. Have emergency warning dissemination methods been added, deleted or modified since the last verification? \_\_\_\_Yes \_\_\_\_No *If yes, attach a copy of the changes. [See Attachment \_\_\_\_.]*

27. Has the local government's area of jurisdiction changed since the last verification?  
\_\_\_\_Yes \_\_\_\_No

A. If yes, do the changes add SFHA to the community's area of jurisdiction?  
\_\_\_\_Yes \_\_\_\_No *If yes, mark these new areas on the FIRM and attach. [See Attachment \_\_\_\_.]*

B. If yes, have these new streams been included in the flood warning program?  
\_\_\_\_Yes. Provide a description of the flood threat recognition system for these areas. *[See Attachment \_\_\_\_.]*

\_\_\_\_No. What percentage of the SFHA buildings are located in the area not covered by flood forecast with peak flow or elevation data? \_\_\_\_\_

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Community : \_\_\_\_\_

28. If the local government requested credit for critical facilities planning,
- A. How many critical facilities within the community's jurisdiction need advanced warning for a flood event? \_\_\_\_\_
  - B. How many critical facility managers receive the advanced warning they have identified they need to prepare for a flood? \_\_\_\_\_ *Send a list of critical facilities with their required warning time and contact information for technical review.*  
*[See Attachment \_\_\_\_.]*
29. How many critical facilities have flood response plans that have been developed, reviewed, or approved by the local government? \_\_\_\_\_ *Send a list of critical facilities with flood response plans that have been developed, reviewed or approved by the local government.*  
*[See Attachment \_\_\_\_.]*

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Comments:

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AW-UF	Uncertain Flow Path Hazards

Community : \_\_\_\_\_

**612 Impact Adjustment:**

Credit points for each element are adjusted to reflect the extent of coverage of the flood warning program. Local governments should describe the impact of their flood warning program using one of the following options.

Option 1:

The flood threat recognition system, the warning dissemination system, and the flood response tasks COVER THE ENTIRE Special Flood Hazard Area (SFHA). \_\_\_\_ Yes \_\_\_\_ No [*Remember, the area credited by the flood warning program is the area where the warning program can forecast specific flood conditions in the future. This includes areas where flood elevations and arrival times can be forecast. It does not include areas where the National Weather Service or others can only predict flooding "along streams and low areas."*]

Option 2:

If the flood threat recognition system, the warning dissemination system, and the flood response tasks COVER LESS THAN THE ENTIRE SFHA, the local government may use a default value of 0.25 for rFTR, rEWD, and rORE. \_\_\_\_ Yes \_\_\_\_ No

Option 3:

Where local flood warning programs COVER MORE THAN 25% OF THE STRUCTURES, **BUT NOT ALL OF THE STRUCTURES** in the SFHA, the community may use Option 3. Using this option the impact adjustment ratios for FTR, EWD, and ORE are computed by dividing the number of buildings affected by each element by the total number of buildings in the SFHA (bSF).

$$rFTR = \frac{bFTR}{bSF} = rFTR = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

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Comments:

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Community : \_\_\_\_\_

**620 LEVEE SAFETY**

**622 Impact Adjustment:**

- a. Option 1: rLP = 1.0
- b. Option 2: rLP = 0.01
- c. Option 3: rLP =  $\frac{bLP}{bSF}$  = \_\_\_\_\_

**623 Credit Calculation:**

9 x LPL \_\_\_\_\_ x rLP \_\_\_\_\_ = \_\_\_\_\_

c620 = value above rounded to the nearest whole number: c620 = \_\_\_\_\_

Enter this value on AW-720-1.

**624 Credit Documentation:**

- a. Levee protection level documentation. EITHER:
  - \_\_\_\_\_ A statement signed by the U.S. Army Corps of Engineers that states the levee protection level and the date of construction, OR
  - \_\_\_\_\_ A certification by a licensed professional engineer that states that the levee meets all the NFIP levee recognition requirements except for height, provides the date of construction, the levee protection level, and shows that all mechanized interior drainage systems have been tested.
- \_\_\_\_\_ b. The levee emergency response plan that specifies actions to take at various flood stages.
- \_\_\_\_\_ c. The map showing the area protected by the levee, designated as "LP."
- \_\_\_\_\_ d. The Impact Adjustment Map (if Option 2 or 3 is used). and
- \_\_\_\_\_ Documentation showing how bLP and bSF were determined.

**The following will be needed at the annual recertification:**

- \_\_\_\_\_ e. A certification by a licensed professional engineer that the levee has been maintained in such a manner that it meets all the NFIP levee maintenance requirements.
- \_\_\_\_\_ f. Documentation of the monthly communications checks between local emergency officials and the agency responsible for the levee and a description of the exercise or drill of the levee emergency plan or the response to an actual emergency or disaster conducted during the previous year.
- \_\_\_\_\_ g. A copy of the materials that notify occupants of the area protected by the credited levee.

Comments:

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Community : \_\_\_\_\_

## 630 DAM SAFETY

### 632 Impact Adjustment:

- a. Option 1: rDFP = 1.0
- b. Option 2: rDFP = 0.25
- c. Option 3: rDFP =  $\frac{bDFP}{bSF}$  = \_\_\_\_\_

### 633 Credit Calculation:

- a. SDS SDS = \_\_\_\_\_
  - b. cDFP = (DFP1 \_\_\_\_\_ + DFP2 \_\_\_\_\_ + DFP3 \_\_\_\_\_) x rDFP \_\_\_\_\_ = \_\_\_\_\_
  - c. Add SDS and DFP = \_\_\_\_\_
- c630 = value above rounded to the nearest whole number: c630 = \_\_\_\_\_
- Enter this value on AW-720-1.

### 634 Credit Documentation:

There is no documentation required for state dam safety program (SDS) credit.

- a. Dam failure plan (DFP): Pages from the adopted emergency response plan, marked "DFP1," that
  - \_\_\_ (a)(1) Specify that the community will be notified in the event of an impending or actual failure of a dam upstream from the community;
  - \_\_\_ (a)(2) Provide projected inundation areas, flood elevations, and estimated arrival times for flood peaks arising from a failure of the dam; and
  - \_\_\_ (a)(3) Call for an exercise at least annually. The results of the exercise are evaluated and used to revise the response plan.
  - \_\_\_ (b) A procedure to obtain annual reports by the dam operators on the safety and operational status of their dams. Copies of these reports must be sent to the community and the state dam safety office; and
  - \_\_\_ (c) Documentation of monthly communications checks between dam operators and emergency services officials.
- b. DFP warning credit (Mark the documentation for this section "DFP2"): An emergency response plan that details at least three methods of notifying affected residents of an imminent flood resulting from a possible or ongoing dam failure. At least three of the following notification methods must be available:
  - \_\_\_ Sound or voice siren system.
  - \_\_\_ Telephonic notification, AM transmitters and receivers dedicated to dam failure notification.
  - \_\_\_ NOAA Weather Radio. Receivers with Specific Area Message Encoding (SAME) are preferred.
  - \_\_\_ Mobile public address.

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Community : \_\_\_\_\_

- \_\_\_ Emergency Alert System.
- \_\_\_ Cable television override.
- \_\_\_ Door-to-door notification.

c. DFP evacuation planning credit (Mark the documentation for this section "DFP3"):

- \_\_\_ 1. Documentation that the adopted emergency plan that includes evacuation routes and detailed procedures for notifying and evacuating critical facilities, specifically including schools, hospitals, nursing homes, jails, and other locations where there are populations that may have difficulty evacuating the dam failure inundation area; and
- \_\_\_ 2. Documentation of at least annual notification of occupants in the dam failure area of the hazard, the area affected, evacuation routes, and flood safety topics appropriate to the hazard.

- \_\_\_ d. The Impact Adjustment Map (if Option 1 or 3 is used), and
- \_\_\_ Documentation showing how bLP and bSF were determined.

**The following will be needed at the annual recertification:**

- \_\_\_ e. Documentation of the monthly communications checks between local emergency officials and the agency responsible for the dam and a description of the exercise or drill of the dam failure emergency plan or the response to an actual emergency or disaster conducted during the previous year.

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To facilitate verification of DFP, provide the names of the CRS Coordinator and flood warning contact or emergency manager if other than the CRS Coordinator:

CRS Coordinator:		Flood Warning Contact or Emergency Management Coordinator:	
Name:	_____	_____	_____
Title:	_____	_____	_____
Phone:	_____	Fax:	_____
Address:	_____	_____	_____
	_____	_____	_____
Email:	_____	_____	_____

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Comments:

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Community : \_\_\_\_\_

**710 COMMUNITY GROWTH ADJUSTMENT**

**712 Growth Adjustment Calculation:**

a. Average Growth Rate:

AGR1 = USGR = \_\_\_\_\_

AGR2 =  $\frac{\text{USGR} + \text{CMGR}}{2}$  = \_\_\_\_\_

AGR = the larger of the two (AGR1 or AGR2)

If AGR is less than 0.0, then AGR = 0.0

If AGR is greater than 5.0, then AGR = 5.0 AGR = \_\_\_\_\_

b. Community Growth Adjustment:

CGA = 1 + (0.1 x AGR \_\_\_\_\_): CGA = \_\_\_\_\_

Enter this value on AW-720-1.

**713 Credit Documentation:**

\_\_\_\_ If CMGR is used, documentation that the community growth rate (CMGR) data have been accepted by a state or federal agency for reporting requirements.

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Comments:

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Community : \_\_\_\_\_

**720 COMMUNITY CREDIT CALCULATIONS**

**Calculation Section:**

Verified Activity Calculations:	Credit
c310 _____ =	_____
c320 _____ =	_____
c330 _____ =	_____
c340 _____ =	_____
c350 _____ =	_____
c360 _____ =	_____
c410 _____ x CGA _____ =	_____
c420 _____ x CGA _____ =	_____
c430 _____ x CGA _____ =	_____
c440 _____ x CGA _____ =	_____
c450 _____ x CGA _____ =	_____
c510 _____ =	_____
c520 _____ =	_____
c530 _____ =	_____
c540 _____ =	_____
c610 _____ =	_____
c620 _____ =	_____
c630 _____ =	_____

**722 Community Classification Calculation:**

cT = total of above cT = \_\_\_\_\_

Community Classification (from Appendix C): Class = \_\_\_\_\_

CEO Name / Address	CRS Coordinator Name / Address
_____	_____
_____	_____
_____	_____
_____	_____

Date Report Prepared: \_\_\_\_\_

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Community : \_\_\_\_\_

**720m COMMUNITY CREDIT CALCULATIONS (MODIFICATION):**

**Calculation Section:**

Previous Score	Modified Score	Current Credit	CGA Credit	Activity Total
c310 _____	c310 _____	c310 _____ =		_____
c320 _____	c320 _____	c320 _____ =		_____
c330 _____	c330 _____	c330 _____ =		_____
c340 _____	c340 _____	c340 _____ =		_____
c350 _____	c350 _____	c350 _____ =		_____
c360 _____	c360 _____	c360 _____ =		_____
c410 _____	c410 _____	c410 _____ x CGA _____ =		_____
c420 _____	c420 _____	c420 _____ x CGA _____ =		_____
c430 _____	c430 _____	c430 _____ x CGA _____ =		_____
c440 _____	c440 _____	c440 _____ x CGA _____ =		_____
c450 _____	c450 _____	c450 _____ x CGA _____ =		_____
c510 _____	c510 _____	c510 _____ =		_____
c520 _____	c520 _____	c520 _____ =		_____
c530 _____	c530 _____	c530 _____ =		_____
c540 _____	c540 _____	c540 _____ =		_____
c610 _____	c610 _____	c610 _____ =		_____
c620 _____	c620 _____	c620 _____ =		_____
c630 _____	c630 _____	c630 _____ =		_____

**722 Community Classification Calculation:**

cT = total of above: cT = \_\_\_\_\_

Community Classification (from Appendix C): Class = \_\_\_\_\_

CEO Name / Address	CRS Coordinator Name / Address
_____	_____
_____	_____
_____	_____
_____	_____

Date Report Prepared: \_\_\_\_\_

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