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National Flood Insurance Program
Community Rating System

NFIP/CRS

CRS COORDINATOR'S MANUAL

2002

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Public reporting burden for the *CRS Application* worksheets and the *CRS Coordinator's Manual* is estimated to average 30 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the application worksheets. 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 the worksheet. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Federal Emergency Management Agency, 500 C St., S.W., Washington, D.C. 20472, Paperwork Reduction Project (3067-0195). Note: do not send your completed worksheets to this address.

Activity Worksheet No.	**Title**
AW-210	CRS Application Cover Page
AW-214	Recertification Worksheet
AW-230	Modification/Cycle Cover Page
AW-310	Elevation Certificates
AW-320	Map Information
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
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AW-630	Dam Safety
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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

FOREWORD

This is the *Coordinator's Manual* for the Community Rating System (CRS). It includes the *CRS Schedule*, which sets the criteria for Community Rating System (CRS) classification, and *CRS Commentary* on the *Schedule*. Section 100 gives general background information on the CRS. Section 200 explains the application procedures. Sections 300 through 700 explain the credit points and calculations that will be used to verify CRS credit. The procedures in these sections are used by a community to submit a modification for a better CRS classification.

Sections 110 (Introduction) and 120 (CRS Activities and Elements) can be used as a separate document to provide general information about the CRS to interested persons, such as elected officials and the media. See Appendix E to order other free publications about the CRS.

Section 120 also includes a "quick check" for communities to use to determine if they are likely to qualify for credit under the CRS. A community that is considering applying for the CRS should read Sections 110 and 120, and work through the quick check to see if its floodplain management program is likely to qualify for a CRS classification of nine or better.

This manual includes the entire text of the *Schedule*, segments of which are shown in shaded boxes. After most boxes is the *Commentary*, a discussion of the material in the box, more detailed information, examples, and instructions for calculating credit. Some parts of the *Schedule* require no additional explanation, so there is no commentary or discussion after those parts. Examples are found in unshaded boxes, set in small type. Special notes are in italics.

This is what the *Schedule* looks like.

This is what the *Commentary* looks like. The *Commentary* explains and expands on the part of the *Schedule* in the box above it.

Example FRW-1. Examples look like this. Throughout the *Commentary* fictitious communities, such as Floodville, Watertown, Riverview, Gulf Beach County, and North Shore, are used as examples. Floodville is a relatively small town and its floodplain management programs are kept simple in order to provide clear examples of the basic CRS requirements. The other communities are used to illustrate more complicated situations. There are additional examples in the "CRS Credit for . . ." publications listed in Appendix E.

NOTE: *Notes are in italics.*

Changes from the previous edition are noted with a vertical line in the margin. Format, organizational, and example changes are not marked.

To fairly and objectively calculate credit points, the *Schedule* must include mathematical formulae. However, if the calculations are taken one step at a time, as shown in this manual, they are not difficult. New applicants for CRS credit should rely on the *CRS Application*. Its calculations are

much simpler. Communities that are submitting modifications need only use the activity worksheets for their new or modified CRS activities. Copies of this *CRS Coordinator's Manual*, the *CRS Application*, and the activity worksheets are available at no cost (see Appendix E).

Communities and other floodplain management professionals are encouraged to make suggestions on both the content and the form of the CRS. Send them to:

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This document uses many technical terms and acronyms. The terms are defined in the Glossary in Section 130. The acronyms are listed in Appendix B. The most common acronyms are:

NFIP	National Flood Insurance Program
FEMA	Federal Emergency Management Agency; most of the NFIP field work and community coordination is done by the 10 Regional Offices of FEMA
FIMA	Federal Insurance and Mitigation Administration; FIMA is the part of FEMA that is responsible for the NFIP, including the designation of CRS classifications.
CRS	Community Rating System
FIRM	Flood Insurance Rate Map; published by FEMA and provided to communities
SFHA	Special Flood Hazard Area; the floodplain delineated on the FIRM as A and V Zones.

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MAJOR CHANGES IN CRS CREDITS

This section notes the major changes in the scoring for CRS activities made since the CRS was initiated in 1990. They were introduced in the year noted. Other changes, such as added examples, minor revisions to documentation requirements, and format changes, are not discussed.

1994: Each section and activity in the 200 through 700 series was summarized in an outline on the first page of the section.

Application Procedures

In each year, one or more activities had additional documentation required with the application instead of being reviewed at the verification visit. This approach has helped to prevent communities from losing credit points after the verification visit.

1992: The application worksheets were revised to reduce the amount of work needed to complete them.

1993 and 1994: The procedures for submitting modifications were revised. A modification of one element in an activity requires an application worksheet and documentation for all the elements of the activity. A modification that results in a two-class improvement requires a reverification that includes the application worksheets and documentation for all activities.

1994: The criteria for reverifying a community's credit points every few years are explained in a new Section 234.

1994: A new *Short Form Application* was introduced. It is a separate publication that provides a simpler way to submit an initial application. Appendix E gives more information.

1996: The *Short Form Application* was expanded to include all activities and elements and was named the *CRS Application*. New applicants for CRS credit must use the *CRS Application.*

1999: In order to attain a Class 7 or better classification, a community must have a Building Code Effectiveness Grading Schedule (BCEGS) of Class 6 or better. To attain a Class 4 or better, a community must demonstrate that it has taken appropriate steps to eliminate or minimize future flood losses.

2002: To attain a Class 1, a community must demonstrate that it has taken additional appropriate steps to eliminate or minimize future flood losses.

240 (Floodplain Management Plan)

1992: Credits for planned activities were changed to modify the activities rather than the elements. The "p" credit for an element was changed to a "p" credit for that activity's total score.

Calculating the credits for the plan was moved from the activity's application worksheet to AW-720. As a result of this scoring change, the total credit points for a given activity either remains the same or increases.

1994: The planning process was revised to be more explicit and to include reviewing activities that protect natural and beneficial functions. Credit for five activities can be increased by 15% for protecting natural and beneficial functions.

1996: Credit for the floodplain management plan was moved to Section 510 and revised to provide credit for the planning process rather than the content of the plan.

310 (Elevation Certificate)

1992: To simplify the formulae, ECCF (Elevation Certificates in Computer Format) was changed from being a multiplier worth up to 12.7 points to a separate variable worth up to 15 points. The total possible points increased from 140 to 142. However, few if any communities had enough points for the multiplier to be worth more than 10 points. Therefore, for most communities, the total credit for this activity either stayed the same or increased slightly.

1994: A default impact adjustment was added for communities that have elevation certificates for at least 25% of their post- or pre-FIRM buildings or at least 25% in computer format.

2002: A new element, ECWS (Elevation Certificate Data on a Website), was added.

320 (Map Information)

1994: More guidance was provided on telling inquirers of the flood insurance purchase requirement.

1999: More explicit guidance was given on providing information about areas designated as part of the Coastal Barrier Resources System.

330 (Outreach Projects)

1994: Three new topics were added, bringing the total possible points up from 175 to 250: a map of the local flood hazard, the substantial improvement requirements, and natural and beneficial functions. A fourth element, FML (Floodplain Mailing List), was added.

1996: FML was dropped.

1999: A new element was added to allow a community to receive more points by implementing outreach projects pursuant to an adopted public information program strategy (OPS).

340 (Hazard Disclosure)

1992: To simplify the formulae, REB (Real Estate Agents' Brochure) and DOH (Disclosure of Other Hazards) were changed from being multipliers worth 9.2 points to separate variables worth 10 points. The total credit for this activity either stayed the same or increased slightly.

1999: An alternative approach to crediting Disclosure of the Flood Hazard (DFH) by real estate agents was initiated.

350 (Flood Protection Information)

1994: Credit was increased for having documents related to protecting natural and beneficial functions and the Floodplain Management Resource Center. The requirement for publicity and related documentation was dropped, but documents must be kept in the card catalog or equivalent retrieval system.

2002: New credit was provided for reference material available on or through a community's website. The points were increased and the title of the activity was changed from "Flood Protection Library" to "Flood Protection Information."

360 (Flood Protection Assistance)

1994: The credit criteria were substantially revised, although the total possible points remain the same.

1996: Points were added if the person providing the assistance graduated from the Emergency Management Institute's retrofitting course.

400 Series (Mapping and Regulations)

1994: More references to the special flood-related hazards were added. Coastal erosion was added as a creditable special hazard. More information is provided in *CRS Commentary Supplement for Special Hazards Credit*, which can be ordered as explained in Appendix E.

410 (Additional Flood Data)

1992: The approach to identifying and measuring the elements in this activity was significantly revised and simplified. The scoring was also changed, so a direct conversion is not possible. The three elements NDS (New Detailed Study), SSA (Site-Specific Analysis), and HED (Higher Standards for Existing Data), were replaced by one, AFD (Additional Flood Data).

The relative scores for the NDS and SSA approaches were incorporated into a new variable, RFE (Regulatory Flood Elevation). If a community received credit for NDS (a detailed study on a relatively long reach), then RFE = 50. An SSA approach (a study of only the development site before a permit is issued) results in RFE = 25.

Credit for additional data in areas studied in detail on the FIRM was formerly credited by HED. If the Federal Emergency Management Agency (FEMA) provided a base flood elevation, then RFE = 0, similar to the credit for HED. However, a new credit has been added for a new study of an area that was already studied in detail on the FIRM. While previously there was no credit for such a restudy, now RFE = 20.

To simplify the formulae, the old variables of AD (Additional Delineations), HHS (Higher Hydrology Standard), and SRAD (State Review of Additional Data) have been changed from multipliers. They are now combined into one element, ADS (Additional Data Standards).

FWS (More Restrictive Floodway Standard) is still worth approximately the same, but its credit points are now based on discrete value ranges instead of a formula. A similar simplification was done to calculate the local cost sharing. The former variable, LCS (Local Cost Sharing), has been replaced by NFS (Non-FEMA Share). Applicants no longer need to research the original study costs because credit is based simply on whether there was any non-FEMA cost sharing.

Three options were introduced for the impact adjustment. The inclusion of a default value was expected to make using the impact adjustment easier.

The denominator in the impact adjustment has been changed from aRF (area of the Regulatory Floodplain) to aSFHA (area of the Special Flood Hazard Area). The maximum value for the impact adjustment changed from 1.0 to 2.0. These changes result in higher scores, especially where the activity covers large areas not mapped as SFHA on the FIRM.

The maximum points for Activity 410 increased from 247 to 360. The maximum is attainable only if the impact adjustment is 2.0. If a more common impact adjustment of 1.0 were used, the maximum would decrease from 247 to 180.

1996: The *Coordinator's Manual* clarified the credit for providing additional flood data in areas affected by one of the special hazards that are covered in the *CRS Commentary Supplement for Special Hazards Credit.*

1999: Credit points for most of the elements were increased and the credit criteria revised.

2002: A new element, CTP, was added to credit studies and mapping done under a Cooperative Technical Partner agreement with FEMA.

420 (Open Space Preservation)

1992: To simplify the formulae, DR (Deed Restrictions) was changed from being a multiplier worth up to 75 points to a separate variable worth 75 points. There is no change in the total credit for DR when it is combined with the impact adjustment.

The impact adjustment now has three options, including a default value for those who do not want to calculate the affected areas.

1994: A new element was added: NB (Natural and Beneficial Functions) worth up to 100 points for open space preserved or restored to its natural state.

1999: The credit points for preserving open space (OS) were significantly increased.

430 (Higher Regulatory Standards)

Most of the changes to Activity 430 have been aimed at simplifying the formulae and crediting partial approaches to an element. Maximum points increased from 35 to 100 for five special hazards. Incorporating low density zoning from Activity 420 increased the total possible points.

1992: Another partial score was made possible for tracking improvements over 5–10 years. These changes did not alter existing applications; they only made it easier to credit alternative approaches to CSI.

The formula for the LSI (Lower Substantial Improvement) threshold was replaced with discrete value ranges.

The impact adjustment now has three options, including a default value for those who do not want to calculate areas.

1994: Credit was provided under foundation protection for adopting the soil testing and compaction language of one of the three national building codes. The credit for regulating additions is no longer mutually exclusive from other cumulative substantial improvement credit. Prohibiting fill under PSC (Protection of Storage Capacity) increased from 50 to 80 points while compensatory storage decreased from 80 to 70.

Three new elements were added, bringing the total possible points up to 905 (including low density zoning):

NBR (Natural and Beneficial Functions Regulations): Up to 25 points for prohibiting development in the floodplain that is hazardous to public health or water quality.

ENL (Enclosure Limits): 50 points for prohibiting first floor enclosures.

OHS (Other Higher Standards): Up to 25 points for other regulations that will be reviewed and scored by FEMA.

1996: Points were added if the person responsible for floodplain permitting graduated from the Emergency Management Institute's course on managing floodplain development.

1999: The credit points were significantly increased for Freeboard (FRB), Protection of Critical Facilities (PCF), and Enclosure Limits (ENL). Credit for tracking Cumulative Substantial Improvements (CSI) was revised. Two new elements, credit for State-mandated Regulatory Standards (SMS), and Building Code and Staffing (BCS), were initiated.

2002: The Building Code and Staffing element was split into two new elements, Building Code (BC) and Staffing (STF). More points were provided under each new element. Two other new elements were added: Manufactured Home Parks (MHP), to credit protection of manufactured homes in existing parks, and Coastal AE Zones (CAZ), to credit higher regulatory standards in these hazardous coastal areas.

2002: Section 430LZ, Low Density Zoning, was renamed 430LD, Land Development Criteria. Points were added under an new element, Land Development Criteria (LDC), to recognize local regulations that encourage preserving floodplain lands as open space.

440 (Flood Data Maintenance)

1992: DMD (Digitized Map Data) was split into two elements, GIS (Geographic Information System) and DPD (Digitized Parcel Data). More credit has been provided for GIS mapping. MAM (More Accurate Base Map) and OM (Overlay Map) have been combined so that more credit is provided for OM (Overlay Map).

GIS, DPD, and OM are no longer mutually exclusive, which allows more credit where new systems are being installed gradually or where one system does not receive maximum credit. Due to the elimination of MAM as a separate element, the maximum points have decreased slightly from 125 to 120.

The impact adjustment now has three options, including a default value for those who do not want to calculate areas.

1994: The element "GIS" was renamed DMS (Digital Mapping System) to avoid confusion with real geographic information systems. Full credit is only possible if the community has a real GIS that works on FEMA's systems.

Ten more points can be obtained for DMS, DPD, and OM for showing special hazard areas, including coastal erosion. A new element was added: EDM (Erosion Data Maintenance) for keeping track of coastal erosion. It is described in *CRS Commentary Supplement for Special Hazards Credit*.

1996: Credit for DMS, DPD, and OM were modified slightly for clarification and consistency.

1999: Three approaches to maintaining flood data were combined under one element, Additional Map Data (AMD). A new element was added to provide credit for maintaining copies of all FIRMs that have been issued for the community (FM).

450 (Stormwater Management)

1992: A review of this activity resulted in several credit point revisions. SZ (Size of Development) dropped from a maximum of 64 to 40 points, and PUB (Public Maintenance) was reduced from 32 to 30 points. These reductions were offset by an increase in DS (Design Storm) from 130 to 155 maximum points.

To simplify the calculation, the formulae for SZ and PUB were replaced by discrete range values. This will change the credit for SMR (Stormwater Regulations) for many communities. Scores for

communities with 100-year design storms will increase, while the scores for communities that regulate to 10-year or smaller storms will generally decrease.

SMP (Stormwater Management Master Plan) and SRSM (State Review of Stormwater Management Plans) were changed from 10% multipliers to discrete values of 25 points. ESC (Erosion and Sediment Control) was moved from Activity 540 to this activity. The 45 points for ESC account for most of the increase in the maximum score from 331 to 380.

1994: There was some reorganization to clarify the importance of the stormwater management regulation language. No credit will be provided under this activity if only very large developments are regulated.

A new element was added: WQ (Water Quality) for stormwater management regulations that require use of best management practices to minimize the impact of stormwater runoff from new developments.

1999: The points for the various subelements in Stormwater Management Regulations (SMR) were revised to provide relatively greater credit for Public Maintenance of Stormwater Facilities (PUB). The maximum for Stormwater Management Master Plan (SMP) was greatly increased and the points for partial credit were clarified.

500 Series (Flood Damage Reduction)

1994: The description of the repetitive loss list and application requirements was clarified. There is a new Section 503 that discusses why the CRS does not credit structural projects.

1996: The repetitive loss requirements were moved from Section 510.

510 (Repetitive Loss Projects)

1992: The formula for the credits from Activity 330 was corrected to account for the number of years between projects. Because Activity 610 was revised, the credits for the contributing elements from 610 were revised. As a result, the maximum points decreased from 444 to 441.

1996: This section was changed to 510 (Floodplain Management Planning). Credit for floodplain management planning was moved from Section 240. Repetitive loss requirements were moved to Section 500. Credit for floodplain management planning and repetitive loss planning were combined and revised to provide credit for the planning process rather than the content of the plan.

2002: The credit criteria were revised and expanded to be consistent with the mitigation planning requirements for other FEMA programs. Additional points were provided to encourage preparing multi-hazard plans and involving more stakeholders in the planning process.

520 (Acquisition and Relocation)

1994: A default impact adjustment was added. If the community has acquired or relocated at least 5 buildings, it can receive 16 points.

1999: The credit points were significantly increased. Additional credit was provided for acquiring or relocating buildings on FEMA's repetitive loss list. A new default impact adjustment formula was instituted.

530 (Flood Protection)

1994: The retrofitting credits were substantially revised to provide less credit for projects that were not engineered or otherwise have a higher possibility of failure. A default impact adjustment was added. If the community has at least 5 buildings that have been retrofitted, it can receive 14 points. A new five-page supplement explains retrofitting techniques.

1999: The credit points were significantly increased. Additional credit was provided for acquiring or relocating buildings on FEMA's repetitive loss list.

2002: CRS credit for protecting buildings with structural flood control projects was incorporated into this activity. The name was changed from "Retrofitting" to "Flood Protection."

540 (Drainage System Maintenance)

1992: Because it is a stormwater management regulation, ESC was moved to Activity 450 (Stormwater Management). This resulted in a lowering of the total possible points from 375 to 330. However, the maximum points for Activity 450 were increased accordingly.

To simplify the formulae, SDR (Stream Dumping Regulations) was changed from being a multiplier worth up to 30 points to a separate variable worth up to 30 points. The impact adjustment now has three options, including a default value for those who do not want to calculate areas.

The requirements for the documentation for CDR (Channel and Basin Debris Removal) were changed. Most communities will need to prepare new program explanations when they resubmit their application for this activity.

1994: In most cases, the application documentation must include a map of the drainage system. There is a new prerequisite for stream dumping regulations: the community must publicize the regulations through an annual outreach project. A new element has been added: EPM (Coastal Erosion Protection Maintenance). It is described in *CRS Commentary Supplement for Special Hazards Credit*.

1999: The approach to crediting Channel and Basin Debris Removal (CDR) and Stream Dumping Regulations (SDR) was revised to allow more flexibility in recognizing local programs.

610 (Flood Warning Program)

1992: This activity was completely revised. Credit is no longer given for Local Data Sharing (LSDS). The same basic documentation is required: a description of the flood threat recognition system and excerpts from the flood response plan. However, all the elements and the scoring have been changed.

The impact adjustment now has three options, including a default value for those who do not want to calculate the affected areas. The maximum points decreased slightly from 205 to 200.

2002: A new element, SRC (StormReady Community), to credit communities that participate in the National Weather Service's StormReady Community Program.

620 (Levee Safety)

1994: A default impact adjustment was added. If the levee protects at least five buildings, the community can receive 9 points. The requirements for levee certification were revised to allow determinations made by the U.S. Army Corps of Engineers.

630 (Dam Safety)

1992: The impact adjustment now has three options, including a default value for those who do not want to calculate the affected areas.

2002: Credit for dam failure regulations was deleted. The credit for Dam Failure Emergency Action Plans (DFP) was expanded, with a net increase in points.

710 (Community Growth Adjustment)

1994: The Donnelley Report Growth Rate was dropped from the calculations for average growth rate.

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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 over 4.5 million policies in force. From 1978 through 2001, over 840,000 losses totaling more than $11 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 Objective

The objective of the CRS is to reward communities that are doing more than meeting the minimum NFIP requirements to help their citizens prevent or reduce flood losses. The CRS also provides an incentive for communities to initiate new flood protection activities. The goal of the CRS is to encourage, by the use of flood insurance premium adjustments, community and state activities beyond those required by the National Flood Insurance Program to:

- Reduce flood losses, i.e.,
  - protect public health and safety,
  - reduce damage to buildings and contents,
  - prevent increases in flood damage from new construction,
  - reduce the risk of erosion damage, and
  - protect natural and beneficial floodplain functions.

- Facilitate accurate insurance rating, and

- Promote the awareness of flood insurance.

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 labelled 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 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 *CRS 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, 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 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 Community Rating System (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.

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 National Flood Insurance Program (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 Flood Insurance Rate Maps 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).

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120 CRS CREDIT POINTS

121 Application for Credit

The Community Rating System provides for 10 classes, with Class 1 having the most premium credit and communities in Class 10 receiving none. A community's CRS class is based on the number of credit points calculated for the activities that are undertaken to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.

A community is automatically a Class 10 community unless it applies for a CRS classification and shows that the activities it is implementing warrant a better classification. A community may apply for CRS credit by submitting a *CRS Application* with appropriate documentation to its ISO/CRS Specialist. Application prerequisites and documentation are discussed in more detail in Section 210.

A community uses the *CRS Application* for its initial application for CRS classification. The community must have at least 500 points using the *CRS Application* to apply for CRS Classification. As explained in Section 230, the final score will be calculated by the ISO/CRS Specialist after a review of the documentation and the community's implementation of its activities at the verification visit.

It is important that the community submit correct and complete materials needed to show what it is doing. Only through a review of the accompanying documentation can FEMA and ISO determine the credit points that should be provided.

A community should apply only for those activities it is actively undertaking and those it knows it can implement in accordance with the *Schedule*. A community should not be overly ambitious and overestimate its first year credit points at the risk of losing credit later for activities it is unable to implement. For example, no credit is provided for draft ordinances. Communities can only receive credit for regulations that have been enacted and enforced.

122 Activity Credit Points

The activities and their maximum credit points are shown in Table 120-1. The third column shows the average credit points received by previous years' applicants for each activity. The averages are based upon the number of applicants for each activity, NOT the total number of applicants for the CRS. The fourth column shows the percentage of all applicants that received credit for each activity since January 1, 1999. Therefore, the average of 80 points for Activity 330 is the estimated average under the 1999 manual for the 79% of the 274 communities that had been verified between January 1, 1999 and December 31, 2000.

Communities should note the average credits for these activities. They provide a better indication of what an applicant can expect for an activity than do the maximum points available. For example, in order to receive 3,200 points for Activity 520 (Acquisition and Relocation), a community must have removed 100% of the structures from the Special Flood Hazard Areas (SFHAs) shown on its FIRM.

The 9% of all communities that applied for credit under Activity 520 averaged 177 points received for their acquisition and relocation work. At least one community has received 2,084 points for Activity 520.

Table 120-1. Credit points awarded for CRS activities.

ACTIVITY	MAXIMUM POSSIBLE POINTS[1]	AVERAGE POINTS EARNED[2]	MAXIMUM POINTS EARNED[3]	PERCENTAGE OF COMMUNITIES CREDITED[4]
300 Public Information Activities				
310 Elevation Certificates	162	72	142	100%
320 Map Information	140	138	140	96%
330 Outreach Projects	315	80	290	79%
340 Hazard Disclosure	81	21	81	54%
350 Flood Protection Information	66	22	30	85%
360 Flood Protection Assistance	71	57	71	42%
400 Mapping & Regulatory Activities				
410 Additional Flood Data	1,373	56	430	26%
420 Open Space Preservation	900	113	954	86%
430 Higher Regulatory Standards	2,720	100	766	78%
440 Flood Data Maintenance	231	66	218	68%
450 Stormwater Management	670	105	446	79%
500 Flood Damage Reduction Activities	309	79	220	14%
510 Floodplain Management Plan	3,200	140	2,084	9%
520 Acquisition and Relocation	2,800	43	384	5%
530 Flood Protection	330	261	330	77%
540 Drainage System Maintenance				
600 Flood Preparedness Activities	225	101	200	29%
610 Flood Warning Program	900	154	520	1%
620 Levee Safety	175	66	100	91%
630 Dam Safety				

[1] *The maximum possible points do not include credit for management of special hazards.*

[2] *The average points earned are based on communities' scores that have been verified since the 1999* ***CRS Coordinator's Manual*** *became effective. The average points earned include credit for growth rates, discussed in Section 710.*

[3] *The maximum points earned are the highest scores attained by a community. In some cases many communities have attained the maximum points listed.*

[4] *The percentage of communities credited is based on the number of CRS communities with verified credits since the 1999* ***CRS Coordinator's Manual*** *became effective.*

123 A Quick Check of a Community's Potential CRS Credit

a. Purpose

A minimum of 500 points is needed to receive a CRS classification of Class 9, which will reduce premium rates. This quick check provides some basic information for local officials to determine if their communities will have enough points to attain Class 9.

If a community does not qualify for at least 500 points, it may want to initiate some new activities in order to attain Class 9. For example, some of the public information activities can be implemented for a very low start-up cost. The quick check can identify where points can be earned for new activities.

b. Quick Check Instructions

The section numbering system is used throughout all CRS publications. Sections 300 through 600 describe the 18 creditable activities. Activity 310 (Elevation Certificates) is required of all CRS communities and Activity 510 (Floodplain Management Planning) is required of designated repetitive loss communities. The rest of the activities are optional. Only the elements most frequently applied for are listed.

If the activity is applicable, the average community score (which is in parentheses) should be entered in the blank to the left to provide a rough estimate of the community's initial credit points.

c. Minimum Requirements

Section 211 (Prerequisites) The community must be in the Regular Phase of the NFIP and be in full compliance with the minimum requirements of the NFIP. The application must include a letter from the Federal Emergency Management Agency (FEMA) Regional Office confirming that the community is meeting all of the latest NFIP requirements.

Activity 310 (Elevation Certificates) All CRS communities must maintain FEMA's elevation certificates for all new and substantially improved construction in the floodplain after the date of application for CRS classification.

Sections 501–503 (Repetitive Loss Areas) A community with properties that have received repeated flood insurance claim payments must map the areas affected. Communities with 10 or more such properties must prepare, adopt, and implement a plan to reduce damage in repetitive loss areas. The FEMA Regional Office can tell whether this applies to any given community.

d. Other Activities

If the activity is applicable, the average community score (which is in parentheses) should be entered in the blank at left to provide a rough estimate of the community's initial credit points.

Public Information Activities (Series 300)

_____ (72) 310 (Elevation Certificates) Maintain FEMA elevation certificates for all new construction. Maintaining them after the date of CRS application is a minimum requirement for any CRS credit.

_____ (138) 320 (Map Information) Respond to inquiries to identify a property's FIRM zone and publicize this service.

_____ (80) 330 (Outreach Projects) Send information about the flood hazard, flood insurance, and flood protection measures to floodprone residents or all residents of the community.

_____ (21) 340 (Hazard Disclosure) Real estate agents advise potential purchasers of floodprone property about the flood hazard; or regulations require a notice of the flood hazard.

_____ (22) 350 (Flood Protection Information) The public library maintains references on flood insurance and flood protection.

_____ (57) 360 (Flood Protection Assistance) Give inquiring property owners technical advice on protecting their buildings from flooding, and publicize this service.

Mapping and Regulatory Activities (Series 400)

_____ (56) 410 (Additional Flood Data) Develop new flood elevations, floodway delineations, wave heights, or other regulatory flood hazard data for an area that was not mapped in detail by the flood insurance study; or have the flood insurance study's hydrology or allowable floodway surcharge based on a higher state or local standard.

_____ (113) 420 (Open Space Preservation) Guarantee that a portion of currently vacant floodplain will be kept free from development.

_____ (100) 430 (Higher Regulatory Standards) Require freeboard; require soil tests or engineered foundations; require compensatory storage; zone the floodplain for minimum lot sizes of 1 acre or larger; regulate to protect sand dunes; or have regulations tailored to protect critical facilities or areas subject to special flood hazards (e.g., alluvial fans, ice jams, or subsidence).

_____ TOTAL FIRST PAGE

_____ (66) 440 (Flood Data Maintenance) Keep flood and property data on computer records; use better base maps; or maintain elevation reference marks.

_____ (105) 450 (Stormwater Management) Regulate new development throughout the watershed to ensure that post-development runoff is no worse than pre-development runoff.

Flood Damage Reduction Activities (Series 500)

_____ (79) 510 (Floodplain Management Planning) Prepare, adopt, implement, and update a comprehensive plan using a standard planning process.

_____ (140) 520 (Acquisition and Relocation) Acquire and/or relocate floodprone buildings so that they are out of the floodplain.

_____ (43) 530 (Flood Protection) Document floodproofed or elevated pre-FIRM buildings.

_____ (261) 540 (Drainage System Maintenance) Conduct periodic inspections of all channels and retention basins and perform maintenance as needed.

Flood Preparedness Activities (Series 600)

_____ (101) 610 (Flood Warning Program) Provide early flood warnings to the public and have a detailed flood response plan keyed to flood crest predictions.

_____ (154) 620 (Levee Safety) Maintain levees that are not credited with providing base flood protection.

_____ (66) 630 (Dam Safety) All communities in a state with an approved dam safety program receive credit.

_____ TOTAL SECOND PAGE

_____ TOTAL FIRST PAGE

_____ TOTAL ESTIMATED POINTS FOR THE COMMUNITY

If this quick check shows that the community could receive at least 500 points, it may want to check its status in the NFIP with the FEMA Regional Office (see Appendix A) and apply for a CRS classification using the *CRS Application*.

124 Publications

The *CRS Application* is used to apply for an initial CRS classification. The basis for CRS credit and community classification is the *Schedule*, which is contained within the *Coordinator's Manual*. The *Commentary* explains and amplifies the *Schedule* and provides examples. The *Coordinator's Manual* is a document a community should have if it wishes to submit a *CRS Application* and MUST USE for modifications for a better CRS classification.

There are a variety of publications available, including activity worksheets, example plans, and publications on credit for mapping and management of special flood-related hazards. These publications are described in Appendix E of the *CRS Application* and the *Coordinator's Manual*. They are available AT NO COST from

Flood Publications
NFIP/CRS
P.O. Box 501016
Indianapolis, IN 46250-1016
(317) 848-2898
Fax: (317) 848-3578

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 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 Chief Executive Officer of the community 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 the Federal Emergency Management Agency 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, which was developed before there was a national standard. The National Flood Insurance Program uses the National Geodetic Vertical Datum (NGVD), which is in relation to mean 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: Federal Emergency Management Agency. Most of the National Flood Insurance Program field work and community coordination are done by the 10 FEMA Regional Offices, which are listed in Appendix A.

FIMA: Federal Insurance and Mitigation Administration. FIMA is the part of the Federal Emergency Management Agency that is responsible for the National Flood Insurance Program, including the designation of CRS classifications.

FIRM: Flood Insurance Rate Map. An official map of a community, on which the Federal Insurance and Mitigation Administration 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 the Federal Insurance and Mitigation Administration 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.

ISO/CRS Specialist: An ISO technician responsible for reviewing community applications for Community Rating System classification and verifying implementation of activities credited by the CRS. The name and telephone number of the ISO/CRS Specialist for a state can be obtained from the FEMA Regional Office (see Appendix A).

Natural and beneficial functions of floodplains:

a. The functions associated with the natural or relatively undisturbed floodplain that moderate flooding, retain flood waters, reduce erosion and sedimentation, and mitigate the effects of waves and storm surges from storms; and

b. Ancillary beneficial functions, including maintenance of water quality, recharge of ground water, and provision of fish and wildlife habitat.

NFIP: National Flood Insurance Program.

NGVD: National Geodetic Vertical Datum of 1929, the national datum used by the National Flood Insurance Program. NGVD is based on mean sea level. It was known formerly as the "Mean Sea Level Datum of 1929 (MSL)."

Ponding: A flooding condition in flat areas caused when rain runoff drains to a location that has no ready outlet. Ponding water usually stands until it evaporates, seeps into the ground, or is pumped out.

Post-FIRM building: For insurance rating purposes, a post-FIRM building was constructed or substantially improved after December 31, 1974, or after the effective date of the initial Flood Insurance Rate Map of a community, whichever is later. A post-FIRM building is required to meet the National Flood Insurance Program's minimum Regular Program flood protection standards.

Pre-FIRM building: For insurance rating purposes, a pre-FIRM building was constructed or substantially improved on or before December 31, 1974, or before the effective date of the initial Flood Insurance Rate Map of the community, whichever is later. Most pre-FIRM buildings were constructed without taking the flood hazard into account.

Regular Program: Also called the Regular Phase. The phase of community participation in the National Flood Insurance Program that begins on the date of the Flood Insurance Rate Map or when the community adopts an ordinance that meets the minimum requirements of the NFIP and adopts the technical data provided with the FIRM, whichever is later. Nearly all communities participating in the NFIP are in the Regular Program.

Regulatory floodplain: For purposes of the Community Rating System, the floodplain that is regulated by a community, including the Special Flood Hazard Area. It covers a larger area in communities that regulate development in flood problem areas outside the SFHA as mapped by the Federal Insurance and Mitigation Administration.

Repetitive loss community: For purposes of the Community Rating System, a community with one or more repetitive loss properties.

Repetitive loss property: For purposes of the Community Rating System, a property for which two or more National Flood Insurance Program losses of at least $1,000 each have been paid within any 10-year rolling period since 1978.

Retrofitting: Retrofitting techniques include floodproofing, elevation, construction of small levees, and other modifications made to an existing building or its yard to protect it from flood damage.

Riparian ecosystem: A distinct association of flora, fauna, and soil occurring along a river, stream, or other body of water and dependent upon high water tables and occasional flooding to maintain its viability. These areas often exhibit high biological productivity and species diversity. Although riparian ecosystems are closely associated with a body of water, they may extend beyond the Special Flood Hazard Area.

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Sand dunes: Naturally occurring accumulations of sand that form ridges or mounds landward of a beach. The Community Rating System only credits sand dunes in coastal areas.

Schedule: See "*CRS Schedule*."

Sensitive area: An area defined by state or local regulations as deserving special protection because of unique natural features or its value as habitat for a wide range of species of flora and fauna. A sensitive area is subject to more restrictive development regulations than other floodplains or wetlands. Although sensitive areas are often closely associated with a body of water, they may extend beyond the Special Flood Hazard Area.

SFHA: Special Flood Hazard Area.

Sheet flow: A condition of flooding where there is moving water but no identifiable channel. Flooding depths are usually shallow (less than 3 feet). Sheet flow may have a high velocity, as on alluvial fans.

Special Flood Hazard Area (SFHA): The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A (see definition). In coastal situations, Zone V (see definition) is also a part of the SFHA. The SFHA may or may not encompass all of a community's flood problems.

Special flood-related hazards: For the purposes of the Community Rating System, the term includes terrain features or special hazards that accompany or aggravate flooding, as listed in Section 401.

Stakeholders: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, landowners, developers, and others whose actions affect hazard mitigation.

Substantial damage: Damage of any origin sustained by a building whereby the cost of restoring the building to its before-damage condition would equal or exceed 50% of the market value of the building before the damage occurred.

Substantial improvement: Any reconstruction, rehabilitation, addition, or other improvement to a building, the cost of which equals or exceeds 50% of the market value of the building before the start of construction of the improvement.

Surcharge: An increase in flood elevation due to obstruction of the floodplain that reduces its conveyance capacity.

Tsunami: A large wave caused by an underwater earthquake or volcano that can raise water levels on the ocean shore as much as 15 feet. Tsunamis are discussed in more detail in a special Community Rating System publication.

Uncertain flow paths: Channels that move during a flood, including alluvial fans and moveable bed streams. They are discussed in more detail in a special Community Rating System publication.

V Zone: See "Zone V."

Variable: A term used in the formulae for calculating Community Rating System credit. For each element, there are one or more variables, which often include the acronym for the element.

X Zone: See "Zone X."

Zone A: The Special Flood Hazard Area (except coastal V Zones) shown on a community's Flood Insurance Rate Map. There are seven types of A Zones:

A: SFHA where no base flood elevation is provided.

A#: Numbered A Zones (e.g., A7 or A14), SFHA where the FIRM shows a base flood elevation in relation to NGVD.

AE: SFHA where base flood elevations are provided. AE Zone delineations are now used on new FIRMs instead of A# Zones.

AO: SFHA with sheet flow, ponding, or shallow flooding. Base flood depths (feet above grade) are provided.

AH: Shallow flooding SFHA. Base flood elevations in relation to NGVD are provided.

AR: A temporary designation for an area where a flood control system that no longer provides protection from the base flood is expected to be improved so it will provide protection to the base flood again in the future. This zone is not considered a Special Flood Hazard Area or "regulatory floodplain" for Community Rating System purposes.

A99: A mapped floodplain that will be protected by a federal flood protection system where construction has reached specified statutory milestones. This zone is not considered a Special Flood Hazard Area or "regulatory floodplain" for Community Rating System purposes

Zone B: Area of moderate flood hazard, usually depicted on Flood Insurance Rate Maps as between the limits of the base and 500-year floods of the primary source of flooding. B Zones may have local, shallow flooding problems. B Zones are also used to designate areas protected by levees and base floodplains of little hazard, such as those with average depths of less than 1 foot.

Zone C: Area of minimal flood hazard, usually depicted on Flood Insurance Rate Maps as above the 500-year flood level of the primary source of flooding. C Zones may have local, shallow flooding problems. B and C Zones may have flooding that does not meet the criteria to be mapped as a Special Flood Hazard Area, especially ponding and local drainage problems.

Zone D: Area of undetermined but possible flood hazard.

Zone V: The Special Flood Hazard Area subject to coastal high hazard flooding. There are three types of V Zones: V, V#, and VE, and they correspond to the A Zone designations.

Zone X: Newer Flood Insurance Rate Maps show Zones B and C (see above) as Zone X. The shaded Zone X corresponds to a Zone B and the unshaded Zone X corresponds to a Zone C.

200 PROCEDURES

This series covers the procedures for applying for a Community Rating System (CRS) classification and the steps for calculating and verifying a community's CRS credit. It also covers annual recertification, modifications to the community's CRS credit, and cycle verification.

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\210 REQUESTING CRS CREDIT

Summary of Section 210

211 Credit Prerequisites

a. Application Prerequisites: To become a Class 9 or better community, a community must have been in the Regular Phase of the National Flood Insurance Program (NFIP) for at least one year; and the Federal Emergency Management Agency (FEMA) Regional Office must confirm in writing that the community is in full compliance with the minimum requirements of the NFIP.

b. Class 7 Prerequisites: To become a Class 7 or better community, a community must have received a classification of 6 or better under the Building Code Effectiveness Grading Schedule.

c. Class 4 Prerequisites: To become a Class 4 or better community, a community must have received a classification of 5 or better under the Building Code Effectiveness Grading Schedule, demonstrate that it has enough points to warrant the class, and demonstrate that it has taken appropriate steps to eliminate or minimize future flood losses by adopting and enforcing a freeboard requirement and by receiving a certain level of points for designated activities.

d. Class 1 Prerequisites: To become a Class 1 community, a community must demonstrate that it has enough points to warrant the class; meets all the Class 4 prerequisites; has had a successful Community Assistance Visit conducted by FEMA within the previous 12 months; and demonstrate that it has (1) a "no adverse impact" approach to floodplain management; (2) a commitment to mitigate its repetitive loss problems as well as problems caused by other natural hazards; and (3) a program to address the threat to life safety and the financial impacts posed by flooding.

212 Application Documents. Application documentation is explained in the separately published *CRS Application*.

213 Application Procedures. FEMA will provide instructions on which *CRS Application* worksheet pages go to FEMA, the State NFIP Coordinator, and the ISO/CRS Specialist. The CRS classification takes effect on May 1 or October 1, whichever date follows completion of the processing of the community's application.

214 Recertification. Each year, the community's Chief Executive Officer must recertify that the community is continuing to implement the activities for which credit has been provided.

215 Modifications. A community may modify its application by applying for credit for new activities, dropping one or more activities, or submitting revised versions of materials the community stated it would update. Modifications are submitted on activity worksheets and are processed in the same manner as CRS applications.

216 The Effect of *CRS Coordinator's Manual* Revisions on Participating Communities. Changes in the *CRS Coordinator's Manual* will not alter a community's CRS classification. However, when a community submits a modification or cycle verification, it must use the *Coordinator's Manual* in effect at that time.

210 REQUESTING CRS CREDIT

211 Credit Prerequisites

a. Application Prerequisites:

To become a Class 9 or better, a community MUST:

1. Have been in the Regular Phase of the NFIP for at least one year; and
2. Be in full compliance with the minimum requirements of the NFIP. If a CRS community is determined at any time to not be in full compliance, it will revert to a CRS Class 10.

A COMMUNITY'S APPLICATION MUST INCLUDE A LETTER FROM THE FEMA REGIONAL OFFICE STATING THAT THE COMMUNITY IS IN FULL COMPLIANCE WITH THE NFIP. (The Regional Offices are listed in Appendix A.) The letter must have been written no earlier than six months before the application is submitted. The Regional Office or State NFIP Coordinator may need to visit the community if they have not been there recently. If so, the application cannot be submitted until the visit is conducted and FEMA confirms the community's full compliance.

b. Class 7 Prerequisite:

In addition to having sufficient points, in order to be a Class 7 or better, a community must have received a classification of 6 or better under the Building Code Effectiveness Grading Schedule (BCEGS). Both BCEGS classifications (residential/personal and commercial) must be a class 6 or better.

The Building Code Effectiveness Grading Schedule (BCEGS) measures a community's building code adoption and enforcement as they relate to natural hazards mitigation. More information on the program and its CRS credits is provided in Section 431.m

CRS Class 8, 9, and 10 communities must meet the BCEGS prerequisite before they can become a CRS Class 7 or better. CRS Class 7 or better communities must have the necessary BCEGS classification before they can improve their CRS classification. When they submit a modification or undergo a cycle verification, these communities must meet the BCEGS prerequisite in order to remain a CRS Class 7 or better.

BCEGS classifications have not been completed in every state in the country. CRS Class 7 or better communities without a BCEGS classification have a grace period that starts when the prerequisite must be met and ends at the next cycle (see Section 234). During the grace period, these communities cannot improve beyond their current CRS class. FEMA and ISO will make every possible effort to provide BCEGS ratings to every current and applicant CRS community that desires one to meet this prerequisite.

c. Class 4 Prerequisites:

1. In addition to having sufficient points, in order to be a Class 4 or better a community must have received a classification of 5 or better under the Building Code Effectiveness Grading Schedule (BCEGS), and

2. Demonstrate that it has taken appropriate steps to eliminate or minimize future flood losses. To do this, a Class 4 or better community must receive credit for the following CRS activities.

   (a) Activity 430 (Higher Regulatory Standards): The community must show that it enforces higher regulatory standards appropriate to manage new development.

      (1) The community must adopt and enforce a freeboard requirement that receives at least 100 points for FRB in Section 431.a, and

      (2) The community must receive at least 250 points under the other elements of Activity 430 (including Section 430LD). For this prerequisite, the points are calculated before factoring in the impact adjustment for all elements except low density zoning.

   (b) Activity 450 (Stormwater Management): The community must receive the following credits for its stormwater management plan(s) (SMP) under Section 451.b:

      (1) 80 points for meeting all of the prerequisites listed in Section 451.a (i.e., full credit for Section 451.b.1(a)),

      (2) 25 points for managing the runoff from all storms up to and including the 100-year event (i.e., full credit for Section 451.b.1(b)), and

      (3) An impact adjustment value of rSMP = 0.5 or more under Section 452.c.2. As an alternative, the community may show that the stormwater management plan(s) cover watersheds that comprise at least 50% of its growth.

   (c) Activity 510 (Floodplain Management Planning): The community must have adopted and be implementing a floodplain management plan that receives at least 50% of the maximum credit under Activity 510, calculated after the impact adjustment. This 50% of the maximum credit must include at least 50% of the available points in each of the Planning Steps 2, 5, and 8.

   (d) The community may propose alternative approaches to minimize flood losses and increases in future flooding that are more appropriate for local conditions.

This prerequisite ensures that high-ranking CRS communities have programs that minimize flood losses and increases in future flooding. A community that cleared most of the buildings from its

floodplain with disaster assistance funds after a flood could not be a Class 4 or better unless it had an effective regulatory program to prevent a recurrence of the problem.

Commentary on Section 211.c.2(a): A Class 4 or better community must receive at least 100 points for its freeboard requirement. See Section 431.a for the details on ensuring that all utilities and ductwork are also protected to the freeboard level.

The community must also adopt and enforce any combination of other higher regulatory standards credited in Activity 430 in order to obtain the needed 250 points. Except for low density zoning, these points are calculated before the impact adjustment. The points for low density zoning are counted after the impact adjustment.

Example 211c-1. Someburg

- has a two-foot freeboard requirement (200 points),
- prohibits critical facilities in the 500-year floodplain (100 points),
- limits enclosures to less than 300 square feet (100 points),
- has a BCEGS classification of 4/4 (30 points), and
- has adopted all of the International Building Codes (60 points).

This arrangement produces the 100 points for freeboard and 290 points for the other elements.

Commentary on Sections 211.c.2(b) and (c): Communities must meet all the other credit criteria for these activities, too.

Because the Stormwater Management and Floodplain Management Plan credits are calculated after the impact adjustment, plans that use the 25% default impact adjustment will not fulfill the prerequisite.

d. Class 1 Prerequisites:

1. In addition to having sufficient points, in order to be Class 1, a community MUST:

   (a) Meet all the Class 4 prerequisites,

   (b) Meet the minimum standards of the NFIP as determined by a Community Assistance Visit conducted by FEMA within the previous 12 months,

   (c) Have all of its program verified through a full verification visit, and

   (d) Demonstrate that it:

(1) Has a “no adverse impact” approach to floodplain management,

(2) Has a commitment to mitigate its repetitive loss problem as well as problems caused by other natural hazards, and

(3) Has a program to address the threat to life safety and the financial impact that flooding poses to the residents of the community.

A “no adverse impact” approach to floodplain management is one in which the action of one property owner or community does not adversely affect the flood risks for other properties or communities. “Adverse impact” is measured by increased flood stages, increased flood velocity, increased flows, or the increased potential for erosion and sedimentation. The “no adverse impact” concept is explained in more detail in papers published by the Association of State Floodplain Managers that can be accessed at http://www.floods.org.

2. To demonstrate that it meets the three prerequisites under 211.d.1(d), above, a Class 1 community must meet the following:

(a) No adverse impact:

(1) All floodplains:

((a)) All new critical facilities and substantial improvements to critical facilities must be protected to the 500-year flood level. This is demonstrated by receiving credit for PCF under Section 431.e in Activity 430 (Higher Regulatory Standards) and by enforcing the regulations throughout the 500-year floodplain.

((b)) The community must be enforcing regulations that discourage development in the floodplain. This is demonstrated by receiving at least 50 points under LDC in Section 431LD.a.

((c)) The community must have mapped and be enforcing regulations appropriate for all flood-related hazards within its jurisdiction. This is demonstrated by receiving credit for all appropriate special hazards under Activities 410 and 430.

(2) Riverine floodplains:

((a)) Regulatory flood elevations must be provided for all Special Flood Hazard Areas in the community. This is demonstrated by receiving credit for RFE for all approximate A Zones under Section 411.a.1 in Activity 410 (Additional Flood Data).

((b)) The community’s program must address potential increases in riverine flood elevations caused by new development. This is demonstrated by receiving the following credit:

((1)) Activity 450 (Stormwater Management): The impact adjustment value of rSMP = 0.75 or more. As an alternative, the community may show that the stormwater management plan(s) cover watersheds that comprise at least 75% of its growth AND

((2)) Either:

- All riverine floodplains must be mapped using future conditions hydrology and credited under ADS in Section 411.b.1, OR
- All riverine floodplains must be covered by freeboard regulations sufficient to protect new construction from future increases in flood heights and credited under FRB in Section 431.a.

(3) Coastal floodplains: The community must receive credit for:

((a)) Regulating new development in coastal A Zones under CAZ in Section 431.p, and

((b)) Regulating new development in areas subject to erosion under CER in Section 431CE.a in *CRS Credit for Management of Coastal Erosion Hazards* or demonstrating that it does not have a coastal erosion problem.

(b) Mitigation:

(1) Section 501 (Repetitive Loss List): The community must demonstrate that at least 25% of the properties on its current repetitive loss list have been protected from repetitive flooding through acquisition, retrofitting, or structural flood control projects.

A community that has more than 25% of its buildings at risk on the repetitive loss list cannot be a Class 1 community. Communities with higher percentages can reduce their repetitive loss exposure through acquisition, retrofitting, or structural flood control projects. The repetitive loss list is updated after such mitigation measures are in place.

(2) Activity 510 (Floodplain Management Planning): The FEMA Regional Office must have approved the community's plan as meeting all of FEMA's current multi-hazard mitigation planning requirements outlined under 44 *CFR* 201.6.

A floodplain management plan is required in order for a community to be a Class 4 or better. Activity 510 (Floodplain Management Planning) includes the criteria for both a CRS-credited floodplain management plan and a multi-hazard mitigation plan that meets the Disaster Mitigation

Act of 2002 planning requirements per 44 *CFR* 201.6. A community can either prepare a new plan that meets both programs' criteria or update its plan to include any missing items.

(c) Life safety and financial impact:

(1) The community must cover the topics of flood warning and flood safety in EITHER:

((a)) An outreach project that reaches all properties in the community that is credited under OPC in Section 331.a, *OR*

((b)) One or more outreach projects that reach appropriate audiences as determined by the strategy credited under OPS in Section 331.c.

(2) The community must have a flood warning program that receives the following credits or demonstrate that a flood warning program would not reduce the threat to life and safety.

((a)) Credit for flood response efforts credited under ORE in Section 611.c.2(a), and

((b)) Credit for coordinating with all critical facilities affected by flooding under CFP in Section 611.d.

(3) If the failure of a high hazard dam that is listed on the National Inventory of Dams would likely cause loss of life in the community, then it must have adopted a dam failure emergency response plan that is credited under DFP in Section 631.b.

(4) At least 50% of the buildings in the community's Special Flood Hazard Area must be covered by a flood insurance policy.

3. The community may propose alternative approaches to documenting that it has met the three requirements under 211.d.1(d), above.

212 Application Documents

Application for Community Rating System (CRS) classification is voluntary. A complete application must include the appropriate worksheet pages from the *CRS Application* and the documents that must be submitted with them as noted in the Application Documentation section for each activity in the *CRS Application*. No credit is given if the application is incomplete.

A community that applies is required to submit all the application documents needed, including application for credit under Activity 310 (Elevation Certificates). Repetitive loss communities must also meet the requirements of Sections 501 (Repetitive Loss List), 503 (Repetitive Loss Area Outreach Project), and Activity 510 (Floodplain Management Planning), if applicable.

Worksheet pages are included in the *CRS Application*. They are used by the applicant to ensure that the application is complete and to calculate credit points. See Appendix E for information on obtaining the *CRS Application*. Appendix I includes the pages from the *CRS Application* that explain the application documents.

213 Application Procedures

a. Application Submittal: A community should contact its FEMA Regional Office to find out who gets what parts of the application. A complete application (appropriate worksheet pages and all needed documentation) is always sent to the community's ISO/CRS Specialist.

All or parts of the application are sent to the FEMA Regional Office, Attn: Director, Mitigation Division, and to the State NFIP Coordinator.

The FEMA Regional offices are listed in Appendix A, the ISO/CRS Specialists are in Appendix G, and the State NFIP Coordinators are listed in Appendix H.

A community's application will not be processed under the following circumstances:

- If the community is not in full compliance with the NFIP,
- If the application is incomplete, or
- If the application does not have the 500 points needed to warrant a Class 9.

b. Application Review: CRS classifications take effect on May 1 and October 1 of each year. Although a community may apply for a CRS classification at any time, it should be aware of the time needed to process and review the application.

The ISO/CRS Specialist and FEMA Regional Office will need approximately one month to conduct the application review. Once the application review confirms that a community should have the 500 points needed for a Class 9, the ISO/CRS Specialist schedules a verification visit. This visit must be held within six months of receipt of a complete application.

During the verification visit, the ISO/CRS Specialist will review the community's activities according to the scoring criteria in the *CRS Coordinator's Manual*. For example, a random sample of elevation certificates will be checked to see if they are complete and correct. A community's credit

points could increase or decrease based on these reviews and the more accurate scoring formulae in the *Coordinator's Manual*. This verification process is explained in more detail in Section 230.

After the verification visit is complete and all needed documentation has been received, FEMA and ISO need several months to review, double check, and confirm the ISO/CRS Specialist's verification report. Once FEMA confirms the community's classification, it must give the insurance companies a four-month advance notice, so they can advise their agents of the rating change before policies are renewed. Therefore, a community's classification will take effect on the May 1 or October 1 approximately 8–12 months after the application is submitted.

214 Recertification

Each year, a community must recertify by October 1 that it is continuing to implement the activities for which it has earned credit. Recertification is done on the recertification worksheet, AW-214, which is prepared by ISO and sent to the community each August.

The recertification worksheet, AW-214, lists community data and the activities and elements the community is implementing for CRS credit. It may be several pages long, depending on the number of credited activities. The ISO/CRS Specialist will provide instructions on which pages and documents go to the FEMA Regional Office and the State NFIP Coordinator. A complete set is sent to the ISO/CRS Specialist.

As noted in their credit documentation sections, some activities have additional requirements that must be submitted with the annual recertification. These are noted on the AW-214 that is sent to the community. The recertification may also include documentation requested by the ISO/CRS Specialist to verify continued implementation.

Any community that has received a Class 9 or better classification will revert to Class 10 on the following May 1 unless it submits the signed recertification worksheet by October 1 of each year. If the recertification does not include all the needed documentation, the community may lose enough points to cause a retrograde in its CRS classification.

An example of the first page of the recertification worksheet, AW-214, for the City of Riverview is shown in Figure 210-1. In addition to the signed worksheet, the community will need to include one or more attachments as noted on its worksheet.

A COMMUNITY THAT FAILS TO RECERTIFY WILL REVERT TO A CLASS 10. Failure to submit the listed items will result in loss of credit for those activities. A REPETITIVE LOSS COMMUNITY THAT FAILS TO SUBMIT A COPY OF ITS ANNUAL OUTREACH PROJECT OR A CATEGORY C COMMUNITY THAT FAILS TO SUBMIT ITS ANNUAL PROGRESS REPORT AS REQUIRED BY ACTIVITY 510 (FLOODPLAIN MANAGEMENT PLANNING) WILL REVERT TO A CLASS 10.

OMB No. 3067-0195
Expires February 28, 2005

COMMUNITY RATING SYSTEM ANNUAL RECERTIFICATION

Section 1. Community Data

If there are any changes or corrections to the information in this section, please line out the old item and write in the correction.

Community: RIVERVIEW, CITY OF State: ST NFIP Number: 030123

Recertification Date: 10/01/2002

Chief Executive Officer:

Name: Mr. Patrick Kelly Title: Mayor

Address: 402 S. Main Riverview, ST 98754

CRS Coordinator:

Name: Mr. Herman Brewer Title: Director, Community Development

Address: 402 S. Main Riverview, ST 98754

Coordinator's Phone: (101) 555-~~2345~~ 2467 Fax: (101) 555-2370

Coordinator's e-mail: hbrewer@riverview.st.us

Section 2. Certifications

I hereby certify that this community is continuing to implement the activities noted below as credited under the Community Rating System and described in our original application and subsequent modifications.

We are maintaining, to the best of my knowledge and belief, 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.

Signed: Patrick Kelly Date: 9/24/02
Mr. Patrick Kelly, Mayor

Activity Worksheet AW-214-1 Edition: 2002

Figure 210-1a. Page one of Riverview's recertification worksheet (AW-214-1).

OMB No. 3067-0195
Expires February 28, 2005

COMMUNITY RATING SYSTEM ANNUAL RECERTIFICATION

Section 3. Community Activities

Your community has been verified as receiving CRS credit for the following activities. If your community is still implementing these activities the CRS Coordinator needs to put his or her initials in the blank and attach the appropriate items. The numbers refer to the activity number, which is found in the *CRS Coordinator's Manual.*

HB 310 We are maintaining Elevation Certificates on all new and substantially improved buildings in our Special Flood Hazard Area.

HB 320 We are providing Flood Insurance Rate Map information and information on the flood insurance purchase requirement to inquirers.

____ 320 Attached is a copy of the document that told lenders, insurance agents, and real estate offices about this service this year. [HB] Initial here if the information is included in your annual outreach project to the community. Mark the attachment to Activity 330 to show where this service is publicized.]

HB 320 Attached is a copy of one page of the log, a letter, or other record that we kept on this service this year.

HB 330 Attached is a description of this year's annual outreach project to floodplain residents.

HB 430 We continue to enforce the floodplain management provisions of our zoning, subdivision and building code ordinances. [_____] Initial here if you have amended your floodplain regulations. Attach a copy of the amendment.]

HB 450 We continue to enforce the stormwater management provisions of our zoning, subdivision and building code ordinances for new developments in the watershed. [_____] Initial here if you have amended your stormwater management regulations. Attach a copy of the amendment.]

HB 450 We continue to enforce the requirement that all new buildings must be elevated above the street or otherwise protected from drainage problems.

HB 540 We continue to implement our drainage system maintenance program.

HB 540 Attached is a copy of a typical inspection report and a copy of the record that shows that any needed maintenance was performed.

HB 540 We continue to enforce our stream dumping regulations.

Activity Worksheet AW-214-2 Edition: 2002

Figure 210-1b. Page two of Riverview's recertification worksheet (AW-214-2).

215 Modifications

a. A community may modify its application by applying for credit for new elements or activities, dropping one or more elements or activities, or submitting revised versions of materials the community stated it would update annually. Modifications are submitted on activity worksheets, which are found in a separate publication, "CRS Activity Worksheets," available from the CRS. The community must use the credit criteria of the *Coordinator's Manual* and the activity worksheets in effect at the time the application is submitted.

Modifications are submitted using either paper activity worksheets or a printout of activity worksheets using the CRS calculation software, "Computerized Calculations for the Community Rating System." Both can be ordered using the form in Appendix E. The *CRS Application* worksheet pages are used only for a community's first application, not for modifications.

b A community's CRS classification cannot change more than once a year. Therefore, modifications can only be processed after a class change has been made effective.

c. If a community is modifying an activity previously applied for, its submittal must include both the new elements of the activity and those that were previously credited, if still being implemented. Activities not included in the modification are unchanged.

d. If a community submits a modification, the ISO/CRS Specialist will automatically update the community's credit points for its state dam safety program (Activity 630) to reflect the value currently in effect.

e. A community may modify to change its growth rate adjustment by submitting appropriate documentation. If this is done, the total points for all affected 400-series activities will reflect the new growth adjustment. If the community does not request a revised growth rate, modifications submitted for 400-series activities will reflect the growth rate previously used.

f. Modifications are processed and verified in the same manner as CRS applications. The community must also have submitted a recertification by the previous October 1.

g. If a community submits a modification that will result in a two-class increase, the community's entire program will be reverified as explained in Section 234.

h. At any time of the year a community may submit materials to the ISO/CRS Specialist for review and comment on how they would affect its CRS classification. The ISO/CRS Specialist will provide feedback for information purposes only. Such materials will not be kept nor will they be credited to the community's application. The only way a community's credit points may be changed is by submitting a modification with enough points to result in a class change.

i. If the community submits a modification that does not have sufficient credit points to result in a class change, the ISO/CRS Specialist will treat it as material for review under Section 215.h. The materials will be returned to the community with comments. The community's total points will not change. The materials should be submitted later with a modification that will give the community sufficient points for a class change.

j. A community may revert to a Class 10 because it dropped or lost credit for one or more elements or activities. If such a community desires to regain a Class 9 or better classification, it must submit a complete new application according to the *Coordinator's Manual* currently in effect. It may not submit a modification just to correct the problem activities.

Communities are encouraged to submit materials at any time for the ISO/CRS Specialist to review. The courtesy review will help the community prepare its application or modification. However, such review will not affect the community's credit points nor will the ISO/CRS Specialist include the materials in the community's file. Modifications that do not apply for enough points for a class change will be treated as courtesy reviews.

Example 215-1. Someburg's CRS classification was verified as a Class 9 with 872 points. Someburg received credit under Activity 430 (Higher Regulatory Standards) for its freeboard requirement.

Later, Someburg sends its ISO/CRS Specialist a copy of a draft ordinance amendment that will add additional higher regulatory standards. The ISO/CRS Specialist provides comments as a courtesy review and sends the draft back to the community, advising that the amendments will be worth 90 more points under Activity 430. Someburg enacts the ordinance and submits it as a modification.

Someburg's activity worksheets and documentation must include both the new ordinance language and the freeboard language that was previously credited. The modification must also include additional credit points because 872 + 90 more points does not result in a class change. If the modification does not result in the community's total points exceeding 1,000, then FEMA and the ISO/CRS Specialist will treat the submittal as another courtesy review.

216 The Effect of *Coordinator's Manual* Revisions on Participating Communities

From time to time, the *Coordinator's Manual* will be revised. These revisions are necessary to revise CRS credit based upon the experience of earlier applications and to clarify the program for future applicants. Revisions will attempt to minimize any loss of credit for participating communities.

a. A community will keep its credit points according to the *Coordinator's Manual* in effect when it applies for a CRS classification. Except as provided in Section 216.c, below, changes in the *Coordinator's Manual* will not alter the community's CRS classification.

b. If a community submits a modification to its application, the modified activities must be applied for based on the *Coordinator's Manual* in effect at that time. The modification must be submitted on the current year's activity worksheets. The community's total points will be based on the credit points for the unmodified activities from the original application plus the credit points for the modified activities under the current *Coordinator's Manual*, and the current credit points for its state's dam safety program (Activity 630).

c. All of a community's activities will be reverified and the credit points will be recalculated based on the *Coordinator's Manual* currently in effect under the following two circumstances:

   1. When the community submits a modification that will improve its last complete verified CRS classification by two or more classes.

   2. When the community is due for a complete cycle verification of its activities (see Section 234).

Section 234 explains the cycle verification process. A cycle verification includes a complete review and recalculation of all of a community's activities and credit points. The CRS Coordinator should carefully examine any changes made in the *Coordinator's Manual* from year to year to see if they have a negative effect on the community's CRS credit that would cause a loss of one or more CRS classes during cycle verification. Modifications are counted cumulatively. The provisions of Section 216.c.1 apply if there is one modification for a two-class improvement or if there are two one-class modifications since the community's last verification or cycle verification.

A community's credit points may also be affected by annexations or flood control projects that change the floodplain boundaries. These changes can affect the areas or buildings credited under several activities and the impact adjustment calculations. If a project or annexation is contemplated, the CRS Coordinator should contact the ISO/CRS Specialist to review the impact on the community's credit points.

Example 216.c-1. A flood control project results in a map revision that removes 100 buildings from the regulatory floodplain. Twelve of the buildings had been retrofitted and were credited under Activity 530 (Flood Protection). Those buildings are no longer eligible for retrofitting credit because Activity 530 only credits retrofitted buildings that are in the regulatory floodplain.

Example 216.c-2. A community annexes an area that includes a large amount of undeveloped floodplain. The result doubles the size of the community's regulatory floodplain. The community will lose credit points in Activity 420 (Open Space Preservation) because the amount of open space is now a smaller portion of the total regulatory floodplain.

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220 CREDIT CALCULATION

Summary of Section 220

Calculating the Community Rating System (CRS) classification for a community is done in five steps as explained in Sections 221–225, below. Four terms are used throughout the *CRS Coordinator's Manual*:

- The CRS is divided into four SERIES of activities: "Public Information," "Mapping and Regulation," "Damage Reduction," and "Flood Preparedness."
- Within each series, there are three to six ACTIVITIES.
- Within each activity, there are one or more ELEMENTS.
- For each element, there are one or more VARIABLES. These variables often include the acronym for the element. The variables are needed for the formulas that are used to calculate the credit points for each element.

221 Step 1. Element Credit Points. Each activity has a section entitled "Credit Points." Each element has a maximum number of credit points, which can be earned if the element is being implemented to certain standards throughout the community or throughout the floodplain.

222 Step 2. Impact Adjustment. The credit points earned in Step 1 need to be adjusted to reflect the impact of the community's activity on floodplain development and on the community's flood insurance premium base. Step 2's impact adjustment serves to adjust credits so that the dollar impact of premium discounts is spread over the community's entire premium base.

223 Step 3. Credit Calculation. The last step listed for each activity is to compute its credit by multiplying the element's credit points by the impact adjustment. The scores for each element are totalled to compute the activity's credit points.

224 Step 4. Community Growth Adjustment. The points for the five mapping and regulatory activities in the 400 series are adjusted to reflect the community's growth rate.

225 Step 5. Community Classification. The points for all the activities are totalled to calculate the community's CRS classification.

220 CREDIT CALCULATION

Calculating the Community Rating System (CRS) classification for a community is done in five steps as explained in Sections 221–225 below. A community may calculate its own credit points when it fills in the blanks in the worksheets, or it will be done by the ISO/CRS Specialist. If the community uses the data entry software (see Appendix E), all calculations will be done by the computer.

Four terms are used throughout the *CRS Coordinator's Manual*: series, activity, element, and variable. The intent of these divisions is to direct applicants to the credits they qualify for, and to divide the program logically into easily understood pieces.

a. Series

The CRS activities are divided into four series: Public Information, Mapping and Regulation, Damage Reduction, and Flood Preparedness. Their titles are self-explanatory, and the credits within them follow the main objective of the titles. There is no difference in credits among the series, except that Mapping and Regulation credits are increased in growing communities, where mapping and regulations will be most effective in reducing future flood damage.

b. Activities

Each series has from three to six activities. Each activity has a title, such as "Additional Flood Data" or "Flood Warning Program." The titles are mostly self-explanatory, but they may include components that are not specifically named in the title. At the end of the credit calculation process, the credits for all activities are added together to get the community's total score.

c. Elements

Within the activities, there are one or more elements. These are discrete pieces of a community's floodplain management program, and each receives a certain number of credit points.

Example 220.c-1. The elements and their acronyms in Activity 310 (Elevation Certificates) are

- EC, credit for elevation certificates since CRS application;
- ECPO, credit for post-FIRM (Flood Insurance Rate Map) elevation certificates;
- ECPR, credit for pre-FIRM elevation certificates; and
- ECCF, credit for certificates in a computer format.

Some activities, such as 320 (Map Determinations), only have one element. A community need not apply for all elements in an activity in order to receive credit for the activity.

d. Variables

For each element, there are one or more variables. These variables often include the acronym for the element.

Example 220.d-1. The variables associated with post-FIRM elevation certificates are:

- ECPO, the 56 base points;
- bPO, the number of post-FIRM buildings in the community's Special Flood Hazard Area (SFHA);
- bECPO, the number of post-FIRM buildings with elevation certificates;
- rECPO, the impact adjustment ratio for the element; and
- cECPO, the credit for the element.

221 Step 1. Element Credit Points

The first step is to review each activity proposed by the community for adequacy and completeness. Under each activity in the *CRS Schedule* is a section entitled "Credit Points." Each element has a maximum number of credit points that can be earned if the element is being implemented to certain standards throughout the community or throughout the floodplain. A community will receive less than the maximum points if its program does not include all the elements listed in the Credit Points section.

Example 221-1. Under Activity 310 (Elevation Certificates), there are five elements listed in Section 311, Credit Points: 311.a, elevation certificates for building permits issued after the date of CRS application (EC); 311.b, post-FIRM elevation certificates (ECPO); 311.c, pre-FIRM elevation certificates (ECPR); and 311.d, maintaining elevation certificates in a computerized format (ECCF); and 311.e, maintaining elevation certificate data on a website (ECWS).

A community may submit alternative approaches to the listed elements, and they will be reviewed by the Federal Insurance and Mitigation Administration (FIMA) in order to set credit points. Where the approach is difficult to apply to the existing formulae, the applicant should demonstrate its impact on flood damage reduction. Where a state or regional approach is

different, it would be appropriate for the state or regional agency to conduct a study on behalf of its communities and have the approach scored in advance of local applications.

The CRS cannot prescribe credit criteria for every possible case in the country. In many instances, the *CRS Commentary* offers examples of how to apply the criteria to different situations. The community may also make reasonable interpretations that are in line with the intent of the *Schedule* as explained in this *Commentary*.

However, it is recommended that whenever a community has trouble fitting its program into the *Schedule*'s credit criteria, it contact the Regional Office of the Federal Emergency Management Agency (FEMA) or the ISO/CRS Specialist. It may be that the *Schedule* is being misunderstood or misinterpreted and that things are simpler than they first appear.

Each element has letter variables that are used in formulae to calculate the credit points. These variables are listed alphabetically in Appendix B. The variables for basic scoring elements are capitalized, as in "ECPO," the variable that represents elevation certificates for post-FIRM buildings. Variables may be modified with prefixes or suffixes in lower-case letters, as in "cECPO," which is the credit for elevation certificates for post-FIRM buildings.

Example 221-2. As shown in Section 311, the various elements of a community program to maintain elevation certificates are given separate credits. Section 312 uses variables like bPR (number of pre-FIRM buildings in the SFHA) to determine the impact of the community's program on the entire community. In this case, bPR and bECPR are used to determine the number of pre-FIRM floodplain buildings that have elevation certificates.

222 Step 2. Impact Adjustment

A community that has preserved large areas as open space should receive more credit than one that is allowing most of its floodplain to be developed. Therefore, the credit points earned in Step 1 need to be adjusted to reflect the impact of the community's activity on floodplain development.

The credit points also need to be adjusted to reflect the activity's impact on the community's flood insurance premium base, which can include more policies than are actually in the area affected by the activity. For example, 100% of the buildings in the SFHA will benefit from the CRS' insurance premium credit even if only 50% of the SFHA is subject to higher regulatory standards or other activities. Therefore, this Step 2 adjustment also serves to adjust credits so

that the dollar impact of any discounts expressed as a percentage of premium are spread over the community's entire premium base.

Most of the activities have a section entitled, "Impact Adjustment." These describe one or more "r" variables. In the mapping and regulatory activities, the "r" prefix represents the ratio of the area affected to the total area of the floodplain. In the flood damage reduction and flood preparedness activities, they represent the ratio of the buildings protected to the total number of buildings in the floodplain.

Sections 301 through 303 discuss the determination of impact adjustment ratios using building counts (Activities 310, 330, 520, 530, 610, and 620). Sections 401 through 403 discuss the determination of impact adjustment ratios using areas (Activities 410, 420, 430, 440, 450, and 630).

The impact adjustment ratios ("r" variables) usually have a range of 0 to 1. Depending upon the nature of the element, the impact adjustment ratios are based either upon buildings or areas affected. For an element that affects the entire floodplain or all appropriate buildings, the impact adjustment ratio is 1.0.

Example 222-1. The impact adjustment ratios for Activity 310 are established in Section 312. The variable "rECPO" represents the ratio of post-FIRM buildings with elevation certificates to all post-FIRM buildings in the SFHA. If the community has 100 post-FIRM buildings (bPO = 100), and it has elevation certificates for 37 of those buildings (bECPO = 37), rECPO = 0.37, the community receives 37% of the credit for ECPO.

Example 222-2. If the community has elevation certificates for ALL post-FIRM buildings in its SFHA, rECPO = 1.0. In this case, the community does not have to calculate the impact adjustment ratio.

Some activities have no impact adjustment section because the type of activity is assumed to cover the entire floodplain or the entire community. For example, most of the public information programs benefit all residents in the community.

223 Step 3. Credit Calculation

The last step listed for each activity in Sections 300–600 is the credit computation. This is done by means of a formula that uses the prefix "c" to represent the credit points earned at the end of each step. For example, c310 is the credit earned for Activity 310.

In some cases, a "c" variable is calculated for an element. For example, cECPO is the calculated credit for post-FIRM elevation certificates.

Where calculations involve more than one element, the element numbers are represented by the suffix "i+" or "n." Summing up the results of several elements or activities is shown in the credit calculation formulae with the mathematical symbol sigma, "Σ."

Example 223-1. "AFDi" represents elements AFD1, AFD2, and AFD3.

Σ(AFDi) = AFD1 + AFD2 + AFD3.

No calculations should result in more than 2 decimal places. Numbers of 0.005 or higher are rounded up to the next 100th and numbers below 0.005 are rounded down. Final credit points for each activity are rounded to the nearest whole number.

Example 223-2. If calculation of a variable results in a value of 0.134, 0.13 is entered for that variable and used in subsequent calculations. A value of 0.135 is entered as 0.14.

224 Step 4. Community Growth Adjustment

The credit points for the five mapping and regulatory activities in the 400 series are adjusted to reflect the community's growth rate. The faster a community grows, the more important regulating development is to preventing flood losses. The community growth adjustment multiplier is included in the final calculations of the community's score in Section 720. The value to enter is determined in Section 710 (Community Growth Adjustment).

225 Step 5. Community Classification

At Step 5 the points for all the activities are totaled to calculate the community CRS classification. There are 10 classes with Class 1 providing the greatest premium credit. Class 10 communities have no premium credit. All communities that do not apply for CRS classification are Class 10 communities.

The Federal Insurance Administrator determines the points for each CRS class and the insurance premium credits each year. The current premium credits are listed in Appendix C.

A community can be designated as Class 1–9 only after the verification visit.

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230 VERIFICATION

Summary of Section 230

231 Application Review.

a. A community's Community Rating System (CRS) application must include a letter from the Federal Emergency Management Agency (FEMA) Regional Office confirming whether the community is in full compliance with the requirements of the National Flood Insurance Program (NFIP).

b. The ISO/CRS Specialist reviews the application and comments received from FEMA and the State NFIP Coordinator. If the community has enough credit points to become a Class 9, then a verification visit is scheduled.

c. If the application is incomplete or does not have enough points to warrant a Class 9, the community has 30 days to submit additional materials.

232 Verification Visit.

a. Visit scheduling: The ISO/CRS Specialist schedules a verification visit with the community within six months of confirming that the community has enough points to become a Class 9.

b. Verification of documentation: All needed documentation will be reviewed during the verification visit.

c. Verification of credit: Credit is not provided for activities and elements that are not being implemented above a certain threshold. In most cases, at least 50% of an element must be verified.

d. Field verification of credit: Some elements are verified in the field.

e. AW-230: The community's CEO is asked to certify the community's verified program by signing Activity Worksheet AW-230.

233 Post-visit Actions.

a. The ISO/CRS Specialist sends the community a draft verification report. After an internal review, FEMA will send the community the official notice of its verified CRS classification.

b. If the community believes that something was missed or misinterpreted during the verification visit, it may request a reconsideration of its CRS classification.

234 Cycle Verification. Each community's program is reviewed on a periodic cycle to confirm that its credited activities are still being implemented.

a. Cycle verifications are conducted every five years after the original application date for Class 6–9 communities. Class 1–5 communities are done on a three-year cycle.

b. The cycle verification is based on the version of the *CRS Coordinator's Manual* currently in effect.

c. The cycle verification is conducted by the ISO/CRS Specialist during a visit to the community.

d. The community's Chief Executive Officer (CEO) will be asked to certify the community's program by signing the same cover page used to certify a community's application.

e. The ISO/CRS Specialists' cycle verification report is processed in the same manner as a verification report, described in Section 233.

230 VERIFICATION

A community's application undergoes two verification reviews after it is submitted:

1. Application review: The community's application papers are reviewed by the ISO/CRS Specialist, the Federal Emergency Management Agency (FEMA), and, often, the state.

2. Verification visit: If the application is shown to have enough credit points to qualify for a Class 9 classification, then the ISO/CRS Specialist schedules a verification visit. The documentation required during the visit is reviewed and field verification is conducted for some activities. If the community has enough verified points, it is recommended for a CRS classification of Class 9 or better.

231 Application Review

a. A community's application must include a letter from the FEMA Regional Office confirming that the community is in full compliance with the National Flood Insurance Program (NFIP). If the letter is not included or if the community is not in full compliance with the minimum requirements of the NFIP, the application is returned.

b. Once it is confirmed that the community is in full compliance with the NFIP and meets the other prerequisites, the ISO/CRS Specialist examines the documentation for each element and the comments of the state and regional agencies that received the notice of application. If the application shows the community should have enough credit points to become a Class 9, then a verification visit is scheduled.

c. If the community's application is incomplete or does not have enough credit points to warrant a Class 9, the ISO/CRS Specialist contacts the community CRS Coordinator by telephone and letter, describing the deficiencies and giving the community 30 days to provide what is needed. If the deficiencies are not corrected within 30 days, the community remains a Class 10 community until it submits an application with adequate documentation.

Most of the 18 CRS activities require some documentation with the application. If this documentation is missing or inadequate, the application credit is not given. The CRS Coordinator may be called upon to clarify certain aspects of the application or provide missing documentation.

For some activities, the application review is performed by a technical specialist other than the ISO/CRS Specialist. The CRS Coordinator may be contacted about missing or otherwise deficient documentation by one or more of these technical specialists.

If the community cannot meet the documentation requirements or if it cannot receive enough points to warrant a Class 9, further processing of the application by the ISO/CRS Specialist is suspended,

and the community remains a Class 10. The number of points needed for each class is listed in Appendix C.

If the community needs more than 30 days to provide the missing documentation, then a complete new application is needed, prepared in accordance with the *CRS Coordinator's Manual* then in effect.

Example 231.b-1. The City of North Shore's first application was for 700 points, 300 points coming from Activity 540 (Drainage System Maintenance). An application for Activity 540 must include a copy of the community's drainage system maintenance procedures. Without those procedures, North Shore will not have enough credit points to become a Class 9. The ISO/CRS Specialist tells North Shore's CRS Coordinator that she must provide the procedures within 30 days or submit a new application later when all the documentation is ready.

232 Verification Visit

a. Visit scheduling: After the application review concludes that the community could receive at least a Class 9 classification, the ISO/CRS Specialist schedules a verification visit with the community. Representatives from the FEMA Regional Office and/or the State NFIP Coordinator's office may also attend this meeting. If a community is unable to participate in the verification visit, it will remain a Class 10.

The ISO/CRS Specialist calls the CRS Coordinator to schedule the visit within six months of being assured that the community should be at least a Class 9. After they have agreed upon a date, the ISO/CRS Specialist writes a letter confirming the date and describing what will happen during the visit.

b. Verification of documentation: During the verification visit, the ISO/CRS Specialist reviews all documentation that is required during the verification visit. If any of the required documentation is missing or otherwise deficient, credit cannot be verified for that element.

Many CRS elements list documentation that the community must make available during the verification visit. If this documentation is not available, no credit is given for that element.

Example 232.c-1. After North Shore submits the needed documentation, the ISO/CRS Specialist schedules a verification visit. To verify Activity 540 (Drainage System Maintenance), the Specialist reviews the inspection reports and maintenance records that the

city's drainage maintenance procedures state will be kept. If the city cannot produce the reports and records, the ISO/CRS Specialist zeroes out the credit.

c. Verification of Credit: If the visit reveals that any credited activities are not being fully implemented, then the credit points are adjusted. If the ISO/CRS Specialist finds that an element is being implemented below a certain threshold, credit is not provided for that element.

d. Field Verification of Credit: For some elements, the ISO/CRS Specialist verifies credit in the field. If the ISO/CRS Specialist finds that an element is being implemented less than a certain threshold, credit is not provided for that element.

The CRS Coordinator and/or other community staff members are encouraged to accompany the ISO/CRS Specialist on the field visit. For most activities, the ISO/CRS Specialist must verify that at least 50% of each element is being implemented according to the procedures credited. Failure to reach that threshold will result in loss of all credit for that element.

Example 232.d-1. Credit for Channel and basin Debris Removal (CDR) in Activity 540 (Drainage System Maintenance) is verified in the field. The ISO/CRS Specialist selects sites in North Shore's drainage system and inspects them for maintenance as specified in the city's procedures. If the Specialist finds that more than 50% of the sites have debris, sizable trees, and other growth within the channel that demonstrate that the drainage system has not been maintained according to the community's procedures, then the credit for CDR is not verified.

During the verification visit, the community's CRS Coordinator is advised of mathematical errors in the application and other problems that may have been found during the application review and verification visit. There is also an "exit interview" at the end of the visit, when the ISO/CRS Specialist reviews the tentative findings. It is recommended that the exit interview be held with the community's Chief Executive Officer as well as the CRS Coordinator.

e. AW-230: The community's Chief Executive Officer (CEO) is asked to certify the community's verified program by signing Activity Worksheet AW-230.

The verification visit may result in new activities or elements being credited, so the Application Cover Page signed by the CEO may be outdated. If the CEO cannot sign the AW-230 during the visit, a signed copy must be submitted to the ISO/CRS Specialist within 30 days of the visit. A completed example of AW-230 is in Figure 230-1.

OMB No. 3067-0195
Expires February 28, 2005

230 MODIFICATION/CYCLE COVER PAGE

1. Community Name: Floodville State: ST BCEGS: 4 / 5
   NFIP Number: 123456 FIRM Effective Date: May 15, 1980
   Population: 11,000 Current FIRM Date: May 15, 1980
   Modification/Cycle Date: March 15, 2002 County: Isler

2.

	Chief Executive Officer:	CRS Coordinator:
Name:	John Jones	Jane Doe
Title:	Mayor	Ass't City Manager
Address:	3900 Hunter	3900 Hunter
	Floodville, ST 98765	Floodville, ST 98765

Coordinator's Telephone: 101/555-1234 Fax: 101/555-1201
Coordinator's email: jdoe@floodville.ci.us

3. I hereby certify that The City of Floodville [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 the Federal Emergency Management Agency 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		450 Stormwater Management
✓	330 Outreach Projects	✓	502 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.

5. Signed: _____ (Chief Executive Officer)

Activity Worksheet AW-230-1 Edition: 2002

Figure 230-1. Floodville's completed verification cover page (AW-230-1).

233 Post-visit Actions

a. The ISO/CRS Specialist sends a draft verification report to the community's CRS Coordinator, the FEMA Regional Office, and the State NFIP Coordinator. The report and the community's file are reviewed internally by ISO and a recommended classification is submitted to FEMA. FEMA reviews the recommendation and sends the community the official notice of its verified CRS classification and a copy of the final verification report.

A draft verification report is provided to the community's CRS Coordinator soon after the visit. It is then reviewed by ISO, technical advisors, and FEMA. Therefore, the community should be aware that the report may be revised later. The final verification report is sent to the community by FEMA. The verification report includes the verified scores for each activity and a short explanation of the scores.

Visits can also be conducted when FEMA learns of problems in a community that shed doubt on whether it is fully implementing its activities. For example, if there was a flood that damaged areas protected by a credited levee or it appeared that flood warnings were not disseminated, then FEMA may want to review the community's program. Visits may also be conducted to verify a modification that will change the community class (see Section 215) and during cycle verification (see Section 234).

b. If the community believes that something was missed or misinterpreted during the verification visit, it may request a reconsideration of its CRS classification. A request for reconsideration must be submitted to the FEMA Regional Office, Attn: Director, Mitigation Division, within 30 days of receipt of the final verification report from FEMA.

A request for reconsideration must be based upon the activities included in the community's application. The request must include a description of how the community would credit the activity and must reference the sections of the *CRS Coordinator's Manual* that support the community's position. A request to change a community's credit points that does not contain sufficient points to change its CRS classification will not be accepted.

See Appendix A for the addresses of FEMA Regional Offices. The 30-day deadline ensures that the classification is determined as quickly as possible. FEMA will review requests for reconsideration and discuss them with the ISO/CRS Specialist. A meeting may be held, depending upon the need for additional communication. FEMA will provide a written response to the community.

Reconsideration does not include activities implemented after the CRS application or otherwise not included in the application. Activities that were not applied for may be included as a modification in

a succeeding year. If the community feels that there is an error that does not result in a change in CRS classification, it should include its evidence with its next recertification. Corrections will be made during the next verification visit.

Example 233.b-1. The ISO/CRS Specialist verified North Shore's credit points as 711. The CRS Coordinator feels that the ISO/CRS Specialist misread a portion of North Shore's floodplain management ordinance, and that it should receive an additional 75 points. Because the credit in question would not change the city's CRS classification, the reconsideration is disallowed.

234 Cycle Verification

Each community's program is reviewed based on a periodic cycle to confirm that its credited activities are still being implemented.

a. Cycle verifications are conducted every five years after the original application date for Class 6–9 communities. Class 1–5 communities are done on a three-year cycle. The ISO/CRS Specialist may vary from this timetable when there is reason to believe that the community is no longer implementing all of its credited activities, or to combine the cycle verification with visits to nearby communities.

b. The cycle verification is based on the version of the *CRS Coordinator's Manual* currently in effect, not the one used for the original application.

c. The cycle verification is conducted by the ISO/CRS Specialist, who schedules a cycle verification visit. At that visit, the ISO/CRS Specialist reviews the community's program, verifies that the activities are being implemented, requests appropriate documentation, fills out the activity worksheets, and calculates the verified credit points in the same way as for a verification visit described in Section 232.

d. The community's CEO will be asked to certify the community's program by signing Activity Worksheet AW-230. If this cannot be done during the visit, it must be submitted to the ISO/CRS Specialist within 30 days of the visit.

e. The ISO/CRS Specialist's cycle verification report is processed in the same manner as a verification report in accordance with the procedures in Section 233.

Depending on its CRS Class, a community keeps its classification for three or five years after it took effect. One year before its classification lapses, the ISO/CRS Specialist will contact the community to schedule a cycle verification visit.

The cycle verification visit may be scheduled before or after the three- or five-year cycle. Some reasons for variation from this cycle include:

- if the community has a new CRS Coordinator,
- if the community requests an earlier visit to allow time to make corrections to its program before the verified class expires,
- if the community would improve by at least one class due to a *Schedule* change, and
- if time and costs can be substantially saved by combining the cycle verification visit with visits to neighboring communities. Such visits would be scheduled no more than one year earlier or later than the normal cycle visit and will be coordinated well in advance with all communities affected.

Cooperation by the community in scheduling and conducting the visit is vital in order to process the cycle verification in time. Delays and inadequate documentation may mean that the community's CRS classification will not be renewed in time.

During the visit, the ISO/CRS Specialist reviews changes in the *CRS Coordinator's Manual* since the last visit. The community's activities are reviewed, documented and scored. New activities and elements may be added. All activities are verified in accordance with the procedures in Section 232. The ISO/CRS Specialist reviews the findings at the exit interview.

The ISO/CRS Specialist collects all needed documentation that is available. Once the cycle verification papers are complete, the ISO/CRS Specialist forwards the cycle verification report for ISO review and submittal to 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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301 Definition of "Building"

For the purpose of determining CRS impact adjustment ratios, a "building" is a walled and roofed structure, principally above ground and affixed to a permanent site. The term includes a manufactured (mobile) home on a foundation. "Walled and roofed" means that a building has two or more rigid exterior walls in place and is adequately anchored. "Principally above ground" means that at least 51% of the actual cash value of the building is above ground. The term is the same as "structure" in the National Flood Insurance Program (NFIP) regulations (44 *CFR* 59.1).

The key determinant is whether the building is insurable. It must meet the following criteria, which are taken from the Glossary in the NFIP's *Flood Insurance Manual* for insurance agents:

> A building is a walled and roofed structure, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site; including a building in the course of construction, alteration or repair and a manufactured (mobile) home on a foundation.
>
> "Walled and roofed" means it has in place two or more exterior rigid walls and the roof fully secured so that the building will resist flotation, collapse, and lateral movement.
>
> "Principally above ground" means at least 51 percent of the actual cash value of the structure, including machinery and equipment, less land value, is above ground.
>
> "Manufactured (mobile) home" is a building transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term does not include a "recreational vehicle."

This definition is used to determine whether a structure is a building.

Examples of structures that are NOT counted as buildings include open pavilions for picnic tables; bleachers; carports with open sides; underground pumping stations; and sheds on skids that are moved to different construction sites.

Accessory structures are not included when counting buildings for calculating impact adjustments.

For example, a house with a detached garage and shed is counted as one building. The flood insurance policy is based on the elevation of the home. However, if a lot has several principal buildings, each is counted separately because each is normally insured under a separate policy. For example, a motel with three principal buildings is counted as three buildings. If one of the three buildings is an unheated bathhouse for the swimming pool and houses only showers, chemicals, and cleaning supplies, the motel would be counted as two buildings.

A “pre-FIRM building” is a building constructed or substantially improved on or before December 31, 1974, or before the effective date of the initial Flood Insurance Rate Map (FIRM) of the community, whichever is later.

The date of the initial FIRM can be found in the FIRM’s legend under “Flood Insurance Rate Map Effective.” It is usually not the same as the “initial identification” date, which is the date of the community’s first Flood Hazard Boundary Map. Post-FIRM buildings are required to meet the NFIP’s minimum Regular Program flood protection standards.

A “post-FIRM building” is a building constructed or substantially improved after December 31, 1974, or after the effective date of the initial FIRM of the community, whichever is later.

302 Impact Adjustment for Buildings

Most elements in Activities 310 (Elevation Certificates), 520 (Acquisition and Relocation), 530 (Flood Protection), 610 (Flood Warning Program), and 620 (Levee Safety) do not affect all of the buildings that could benefit from them. Credit for these elements is adjusted according to the number of buildings affected.

In order to measure the impact of elements in Activities 310, 520, 530, 610, and 620, the community must determine the portion of its floodprone buildings affected by each element.

Sections 302 and 303 discuss determination of the impact adjustment ratios for the following activities:

310 (Elevation Certificates)

520 (Acquisition and Relocation)

530 (Flood Protection)

610 (Flood Warning Program)

620 (Levee Safety)

Impact adjustment ratios are variables with a lower case “r” preceding the acronym for the element.

Example 302-1. The acronym for elevation certificates for post-FIRM buildings is “ECPO.” The impact adjustment ratio for ECPO is “rECPO.”

A few elements do not have impact adjustment ratios. These elements are assumed to be effective throughout the community. In some cases, credit is provided ONLY if they are implemented throughout the community.

In Activity 320 (Map Information), credit is provided for providing map data to any inquirer about a location anywhere in the community. Because map information must be provided throughout the community, there is no impact adjustment for Activity 320.

A community has three options for determining the value of most of the impact adjustment ratios that are based on numbers of buildings. A community may use one option for some elements and another option for other elements.

a. (Option 1) Where an element is effective throughout the area of the denominator, the impact adjustment ratio = 1.0 for that element.

If an element is effective for all buildings that could be affected by that element, it is unnecessary to count the number of buildings affected. Elements in Activity 610 (Flood Warning Program) are likely to have impact adjustment ratios of 1.0.

Example 302.a-1. Someburg has elevation certificates for all post-FIRM buildings in the Special Flood Hazard Area (SFHA): rECPO = 1.0.

b. (Option 2) If a community implements an element that affects some, but not all, of its floodprone buildings, then it may use a “default” option. The minimum number of buildings affected and the impact adjustment ratio varies from activity to activity.

In Activity 310 (Elevation Certificates), Option 2 can be used if the element affects at least 25% of the buildings in the SFHA. The default impact adjustment ratio for Option 2 for Activities 310 and 610 (Flood Warning Program) is 0.25. In Activities 520 (Acquisition and Relocation), 530 (Flood Protection), and 620 (Levee Safety), Option 2 can be used if the activity affects at least five buildings in the SFHA.

Example 302.b-1. Someburg has elevation certificates on at least 25% of its pre-FIRM buildings: rECPR = 0.25.

c. (Option 3) The value of an impact adjustment ratio is determined by dividing the number of buildings affected by an element (the numerator) by the appropriate denominator. The denominator for the elements in each activity is specified in the Impact Adjustment section for the activity.

For each element with an impact adjustment ratio based on buildings, the numerator is the number of buildings affected by the element, and is designated by a lower case “b” followed by the acronym for that element. The total number of buildings that could be affected by the element is the denominator.

In each activity listed above, there is an Impact Adjustment section. The denominator and formulae for impact adjustment ratios for each element in that activity are listed in that section.

Example 302.c-1. See Section 312.c. Credit for maintaining pre-FIRM elevation certificates (ECPR) is adjusted according to the number of buildings with elevation certificates (bECPR). The denominator for rECPR is bPR, the total number of pre-FIRM buildings in the SFHA.

$$rECPR = \frac{bECPR}{bPR}$$

Someburg counts 400 pre-FIRM buildings in the SFHA: bPR = 400. It has elevation certificates on 260 of them: bECPR = 260.

$$rECPR = \frac{260}{400} = 0.65$$

In this case, Someburg could use either Option 2 or Option 3. Option 2 is easier to calculate because there is no need to count buildings. However, Option 3’s ratio of 0.65 is greater than Option 2’s 0.25, so Someburg would receive more points by using Option 3. If Someburg had elevation certificates for less than 25% of its pre-FIRM buildings, it could only use Option 3.

In summary, the impact adjustment ratios based on the number of buildings affected may be determined in two ways. If all buildings in the denominator are affected by an element, the impact adjustment ratio for that element is 1.0. Otherwise, the number of buildings in both the numerator and denominator must be counted to determine the impact adjustment ratio.

303 Counting Buildings

a. "bSF" is the acronym for the number of buildings within the Special Flood Hazard Area (SFHA). For CRS purposes, AR and A99 Zones are not considered SFHA. The following methods are acceptable for determining bSF.

1. If the community has records of all pre-FIRM and all post-FIRM buildings in its floodplains, a count of the number of permits will suffice;

2. Community staff may count the number of buildings using recent aerial photographs of the floodplains; or

3. Community staff may travel through the floodplains and count the number of buildings.

Communities applying for CRS credit for elements that are adjusted according to the portion of buildings affected by that element must determine the number of buildings for both the numerator and the denominator. Although CRS applicants may consider this a heavy burden, they are reminded that determining the number of buildings in the SFHA is required in the biennial report to FEMA. Many communities ignore this requirement, leaving the previous building count unchanged for years or decades. A community that counts buildings to determine CRS credit is urged to correct the building counts on its next biennial report.

b. To determine building counts for elements and for denominators that do not include all of the SFHA, communities may use any method that yields reasonably good estimates of the number of buildings.

Building counts should be accurate so they will provide the most useful information for both CRS and community planning. Two acceptable methods are:

- Using U.S. Census tract data to estimate the number of buildings; and
- Using the number of utility connections in an area as an estimate of the number of buildings.

Communities are required to document how they obtained their estimates.

The number of post-FIRM buildings, bPO, should be the easiest number to obtain because the NFIP requires the community to keep permit records on all floodplain construction since the effective date of the FIRM.

c. For CRS purposes, a community may determine bSF in one of two ways:

1. bSF = the number of buildings in the community's Special Flood Hazard Area (SFHA) as of the date of application for a CRS classification; or

2. bSF = bPR + (0.6 x bPO), where

   bPR = the number of pre-FIRM buildings in the SFHA, and

   bPO = the number of post-FIRM buildings in the SFHA.

   This approach more accurately reflects the activity's influence on the pre-FIRM and post-FIRM flood insurance premium bases in the community.

bPR, bPO, and bSF do not include buildings located outside of the SFHA as shown on the FIRM in effect on the date of application. They do not include buildings located in the B, C, D, or X Zones, even though the community may be regulating flood problem areas in those zones.

Communities with a small number of post-FIRM buildings will probably find it easier to use the first formula for bSF, i.e., all buildings in the SFHA are counted the same.

Communities with a lot of recent development and a high percentage of post-FIRM buildings will find that the second formula results in a smaller bSF. This will yield more points for the activities that use bSF.

310 ELEVATION CERTIFICATES

Summary of Activity 310

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

a. Maintaining elevation certificates (EC): Up to 56 points are provided for maintaining Federal Emergency Management Agency (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

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 form 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.

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 Federal Emergency Management Agency's (FEMA's) 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 k.

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 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 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 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 is shown in Figure 310-5.

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 310-6 and 310-7.

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 constructed, 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 www.fema.gov/library/elvinst.htm. 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 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 OWNER INFORMATION
- COMPLETE STREET ADDRESS OR PROPERTY DESCRIPTION (2ND OR 4TH LINES)
- CITY, STATE, ZIP CODE (3RD LINE)

SECTION B–FLOOD INSURANCE RATE MAP (FIRM) INFORMATION
- B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER
- B4. MAP AND PANEL NUMBER
- B5. SUFFIX
- B6. FIRM INDEX DATE
- 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. Source of building elevations Note: "Finished construction" must be checked unless the building is still under construction.

C2. Building Diagram Number

C3. Elevations items a), e), f), and g) must be recorded on every certificate, The other items must be completed if the letter appears on the diagram on pages 6 and 7 of the instructions. If a line is not applicable, then insert "N/A." If the letters h) or I) do not appear for that diagram, then enter "0."

SECTION D–SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

CERTIFIER'S NAME and LICENSE NUMBER

CERTIFIER'S SIGNATURE

The box at the end of Section C must have the certifier's seal.

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. Building Diagram Number

E2. The top of the bottom floor

E3. For Building Diagrams 6—8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building

E4. Zone AO only where there is no flood depth on the FIRM, elevation of the bottom floor complies with the local ordinance

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

SECTION G–COMMUNITY INFORMATION

G1. This must be checked if the information in Section C was copied from another certified document. If so, then the local official's name and signature must be completed in G9.

G2. This must be checked if the local official completed Section E. If so, then the local official's name and signature must be completed in G9.

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.

> 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 not 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 Sections C3a)–d), f), or g), the local official should request a new certificate.

2. The local official can do the following if incomplete or inaccurate information is found in Sections A, B, or C1–3e), h) and i). 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 and B, and subsections C1–C3e), h), and i) can be made when the data on the certificate is entered into a database 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 database 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.

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 database, 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.

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.*

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

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

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

3. $rECCF = \frac{bECCF}{bEC + bECPO + bECPR}$, 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. $rECWS = \frac{bECWS}{bEC + bECPO + bECPR}$, 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.

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

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.

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

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. cEC = 56.

b. cECPO = ECPO x rECPO

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

cECPO = 56 x 0.45 = 25.2

c. cECPR = ECPR x rECPR

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

cECPR = 15 x 0.49 = 7.35

d. cECCF = ECCF x rECCF

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

cECCF = 15 x 1.0 = 15.0

e. cECWS = ECWS x rECWS

f. c310 = cEC + cECPO + cECPR + cECCF + ECWS

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, cECPO = 25.2, cECPR = 7.35, and cECCF = 15. The city has not put elevation certificates on a website, so cECWS = 0.

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

C310 = 56 + 25.2 + 7.35 + 15 + 0 = 103.55, 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 examined 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. The ISO/CRS Specialist marks these verified scores on the AW-310, as shown in Figure 310-1a. This reduced 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 reduced that credit from 15 to 13.95.

Floodville's final verified credit for Activity 310 is:

c310 = 50.4 + 25.2 + 7.35 + 13.95 + 0 = 96.90, which is rounded to 97.

The ISO/CRS Specialist marks these verified scores on AW-310-2 as shown in Figure 310-1b.

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.

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.

315 For More Information

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/. The FEMA Regional Office can provide help in completing and maintaining them (see Appendix A). Additional guidance is provided in Figures 310-3 and 310-4.

b. 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.

c. A program named "Computerized Format for FEMA Elevation Certificates" is available free (see Appendix E). It requires an IBM-compatible computer with a CD or 3.5" disk drive.

d. 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://nfip.kevric.com/ecsurveyor/. The insurance agent's tutorial covers how agents use the form. It can be found at http://training.nfipstat.com.

OMB No. 3067-0195
Expires February 28, 2005

310 ELEVATION CERTIFICATES Community : Floodville

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 = bECPO 10 / bPO 22 = 0.45 2. rECPR = bECPR 122 / bPR 250 = 0.49
3. rECCF = bECCF / (bEC ____ + bECPO ____ + bECPR ____) = ____
4. rECWS = bECWS / (bEC ____ + bECPO ____ + bECPR ____) = ____

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
e. cECWS = ECWS ____ x rECWS ____ — cECWS = ____
f. Add lines a through e above = 103.55
c310 = value above rounded to the nearest whole number: c310 = 104

314 Credit Documentation:

✓ EC - Copies of completed Elevation Certificates
(or)
N/A Certification letter if no new construction or substantial improvements
✓ ECPO - Copies of completed Elevation Certificates
✓ ECPR - Copies of completed Elevation Certificates
✓ ECCF - Sample copy of computer format and ECCF letter, if applicable.
N/A ECWS - Printout of sample page. Website address ____
✓ Documentation / explanation of impact adjustment ratios.

Start month/year for which certificates are consistently available: January 1, 1987
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 be submitted (mail, phone, fax, etc.)? mail, phone or fax

Activity Worksheet AW-310-1 Edition: 2002

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

OMB No. 3067-0195
Expires February 28, 2005

Community: Floodville

Verification:

311 Credit Points:

a. Elevation Certificates (EC) :

vEC = ECdoc 9 / ssEC 10 vEC = 0.9

b. Post-FIRM Elevation Certificates (ECPO) :

vECPO = ECPOdoc 5 / ssECPO 5 vEPCO = 1.0

c. Pre-FIRM Elevation Certificates (ECPR) :

vECPR = ECPRdoc 5 / ssECPR 5 vECPR = 1.0

d. Elevation Certificates in Computer Format (ECCF) :

vECCF = ECCFdoc 14 / ssECCF 15 vECCF = 0.93

e. Elevation Certificates on the Web (ECWS) :

vECWS = ECWSdoc ____ / ssECWS ____ vECWS = ____

313 Credit Calculation: If vEC is less than 0.8, c310 = 0.

a. cEC = EC 56 x vEC 0.9 cEC = 50.4

b. cECPO = ECPO 56 x vECPO 1.0 x rECPO 0.45 cECPO = 25.2

c. cECPR = ECPR 15 x vECPR 1.0 x rECPR 0.49 cECPR = 7.35

d. cECCF = ECCF 15 x vECCF 0.93 x rECCF 1.0 cECCF = 13.95

e. cECWS = ECWS ____ x vECWS ____ x rECWS ____ cECWS = ____

f. Add lines a through e above = 96.90

c310 = value above rounded to the nearest whole number. C310 = 97

Comments: ____

Activity Worksheet AW-310-2 Edition: 2002

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

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 2.25 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 each form. You may send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (3067-0077). Do not send completed form(s) to the above 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 or Revision (LOMA or 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), for 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 that the community 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 comply with this requirement.

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.

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.

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

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires July 31, 2002

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME: William Smith

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.: 3802 Woodbridge Road

CITY: Floodville STATE: ST ZIP CODE: 98765

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.): Lot 3, Block 4, Foster Creek Addition

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.): Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°) HORIZONTAL DATUM: [ ] NAD 1927 [ ] NAD 1983 SOURCE: [ ] GPS (Type): [ ] USGS Quad Map [ ] Other:

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Floodville 123456	Isler	ST

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
123456 0001	B	5/15/80	5/15/80	A15	1142.8

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
[X] FIS Profile [ ] FIRM [ ] Community Determined [ ] Other (Describe):

B11. Indicate the elevation datum used for the BFE in B9: [X] NGVD 1929 [ ] NAVD 1988 [ ] Other (Describe):

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? [ ] Yes [X] No
Designation Date:

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: [ ] Construction Drawings* [ ] Building Under Construction* [X] Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 1 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. 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 C3.a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.
Datum NGVD 29 Conversion/Comments N/A
Elevation reference mark used NGS 14-21 Does the elevation reference mark used appear on the FIRM? [ ] Yes [X] No

- a) Top of bottom floor (including basement or enclosure) 1145.0 ft.(m)
- b) Top of next higher floor N/A ft.(m)
- c) Bottom of lowest horizontal structural member (V zones only) N/A ft.(m)
- d) Attached garage (top of slab) 1144.6 ft.(m)
- e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area.) 1144.6 ft.(m)
- f) Lowest adjacent (finished) grade (LAG) 1144.3 ft.(m)
- g) Highest adjacent (finished) grade (HAG) 1144.5 ft.(m)
- h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade 0
- i) Total area of all permanent openings (flood vents) in C3.h 0 sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date: Natalie Jones Lic. #2001 10/10/2000

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

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 in Sections A, B, and C 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: N. G. Nears LICENSE NUMBER: 70501
TITLE: Registered Land Surveyor COMPANY NAME: Nears + Co.
ADDRESS: 4305 W. St. Paul CITY: Floodville STATE: ST ZIP CODE: 98765
SIGNATURE: N. G. Nears DATE: 10/10/2000 TELEPHONE: 101/555-0704

FEMA Form 81-31, JUL 00 SEE REVERSE SIDE FOR CONTINUATION REPLACES ALL PREVIOUS EDITIONS

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

IMPORTANT: In these spaces, copy the corresponding information from Section A.	For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO. 3802 Woodbridge Road	Policy Number
CITY Floodville STATE ST ZIP CODE 98765	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

|__| Check here if attachments

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

For Zone AO and Zone A (without BFE), complete Items E1. through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _____ (Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is |__|__| ft.(m) |__|__|in.(cm) |__| above or |__| below (check one) the highest adjacent grade. (Use natural grade, if available.)

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is |__|__| ft.(m) |__|__|in.(cm) above the highest adjacent grade. Complete Items C3.h and C3.i on front of form.

E4. For 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, C (Items C3.h and C3.i only), 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, C, 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.

G1. |__| The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local 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 is: _____ . ___ ft.(m) Datum: _____

G9. BFE or (in Zone AO) depth of flooding at the building site is: _____ . ___ ft.(m) Datum: _____

LOCAL OFFICIAL'S NAME TITLE

COMMUNITY NAME TELEPHONE

SIGNATURE DATE

COMMENTS

|__| Check here if attachments

FEMA Form 81-31, JUL 00 REPLACES ALL PREVIOUS EDITIONS

Figure 310-2d. Page two 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 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.

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

SECTION A - PROPERTY OWNER INFORMATION

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 number. 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 Section F if needed.

If latitude and longitude data are available, enter them in degrees, minutes, and seconds, or in decimal degrees, taken at the center of the front of the building. Enter arc seconds to two decimal places. Indicate the horizontal datum and the source of the measurement data (for example, taken with GPS, scaled from a USGS Quad Map, etc.).

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

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 and a pamphlet titled "Guide to Flood Maps" are available from the Federal Emergency Management Agency (FEMA) website at http://www.fema.gov or by calling 1-800-427-4661. 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.

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 building that is 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. 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 website at http://www.fema.gov or by calling 1-800-427-4661.

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).

Instructions – Page 1

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

Item B4. Map and Panel Number. Enter the 10-digit number shown on the FIRM panel where the building or manufactured (mobile) home is located. The first six digits will not match the NFIP community number: 1) when the sixth digit is a "C," in which case the FIRM panel is in a countywide format; or 2) when one community has annexed land from another community but the FIRM panel has not been updated to reflect this annexation. If the sixth digit is a "C," it is followed by a four-digit map number. For maps not in countywide format, enter the "community panel number" shown on the FIRM.

Item B5. Suffix. Enter the suffix letter shown on the FIRM panel that includes the building's location.

Item B6. FIRM Index Date. Enter the effective date or 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 1-800-427-4661.

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.

Item B9. Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Flood Elevation 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, the community may have established BFEs or obtained BFE data from other sources. 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 the BFE is obtained from another source, enter the BFE in Item B9.

Item B10. Indicate the source of the BFE that you entered in Item B9.

Item B11. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced.

Item B12. Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). Federal flood insurance is prohibited in designated CBRS areas for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS designation. An information sheet explaining CBRS areas may be obtained on FEMA's website at http://www.fema.gov or by calling 1-800-427-4661.

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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 LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead.

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. 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. Select the diagram on pages 6 and 7 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C3.a-g. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified, or provide a sketch or photograph of the building and enter all elevations in Items C3.a-g.

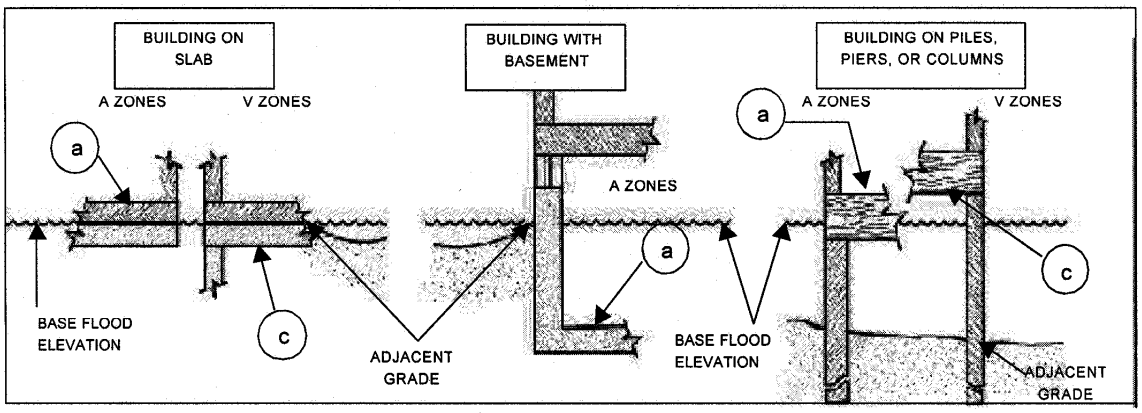
Item C3. Indicate whether the elevation reference mark (benchmark) used during the field survey is an elevation mark on the FIRM. If it is not, indicate the source and datum for the elevation. Vertical control benchmarks other than those shown on the

Instructions – Page 2

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

FIRM are acceptable for elevation determinations. Show the conversion from the field survey datum used to the datum used for the BFE(s) entered in Item B9. All elevations for the certificate 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 recently adjusted 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 C3.a-g to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items C3.a-d. Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item C2.) in Items C3.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C3.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 C3.c. If the flood zone cannot be determined, enter elevations for all of Items C3.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). *If any item does not apply to the building, enter "N/A" for not applicable.*



Item C3.e. Enter the lowest elevation of machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment in an attached garage or enclosure or on an open utility platform that provides utility services for the building. 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 G or Section D, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

Items C3.f-g. Adjacent grade is defined as the elevation of the ground, sidewalk, patio slab, or deck support immediately next to the building. 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.

Items C3.h-i. Enter the number of permanent openings (flood vents) in the walls supporting the building that are no higher than 1.0 foot above the adjacent grade. Determine the total area of all such openings in square inches (square cm, in Puerto Rico), and enter the total in Item C3.i. If the building has no permanent openings (flood vents) within 1.0 foot above adjacent grade, enter "0" (zero) for each of Items C3.h and C3.i.

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 embossed seal and signature in the box next to elevations in Section C. A flat stamp is acceptable only in states that do not authorize use of an embossed seal over the signature of a professional. You are certifying that the information in Sections A, B, and C on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable 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.

Instructions – Page 3

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

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

Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead.

Item E1. Select the diagram on pages 6 and 7 that best represents the building; then enter the diagram number. If you are unsure of the correct diagram, select the diagram that most closely resembles the building, or provide a sketch or photograph.

Item E2. Enter the height in feet and inches (meters and centimeters, in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). For post-FIRM buildings in Zone AO, the community's floodplain management ordinance requires that this value equal or exceed the base flood depth 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 E3. For Building Diagrams 6-8 with "proper openings" (see page 7), enter the height in feet and inches (meters and centimeters, in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above the highest adjacent grade (HAG). Be sure that you have completed Items C3.h and C3.i on the front of the form to show the number of permanent, proper openings (flood vents) within 1 foot above adjacent grade and the total area of the openings.

Item E4. 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.

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

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, C (Items C3.h and C3.i only), 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.

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

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. 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 embossed 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.

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.

Instructions – Page 4

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

Item G6. Date Certificate of Compliance 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, 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.

Instructions – Page 5

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

BUILDING DIAGRAMS

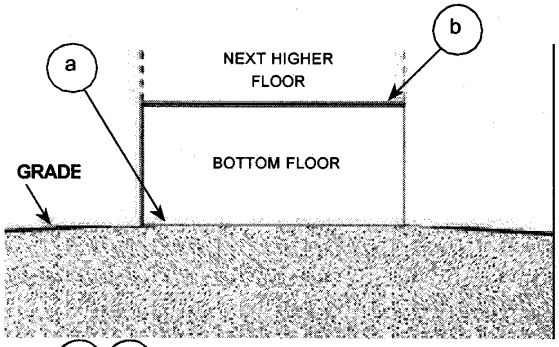
The following eight diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item C2. and the elevations in Items C3.a-C3.g.

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).

DIAGRAM 1

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

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

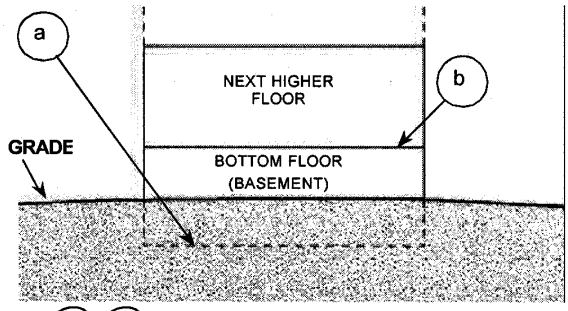


f g (determined by existing grade)

DIAGRAM 2

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

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides. Buildings constructed above crawl spaces that are below grade on all sides should also use this diagram.*

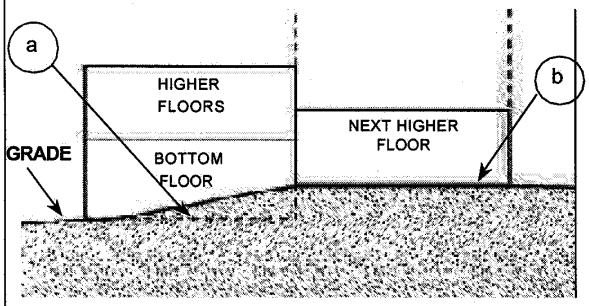


f g (determined by existing grade)

DIAGRAM 3

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

Distinguishing Feature – The bottom floor (excluding garage) is at or above ground level (grade) on at least one side.*

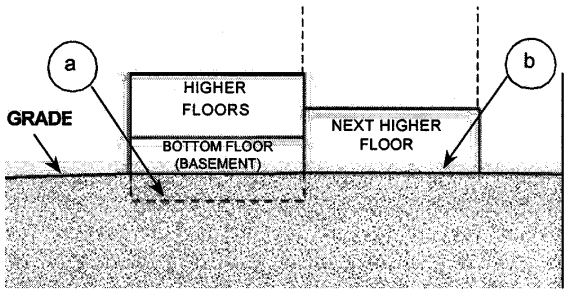


f g (determined by existing grade)

DIAGRAM 4

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

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides. Buildings constructed above crawl spaces that are below grade on all sides should also use this diagram. *



f g (determined by existing grade)

* 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.

Instructions – Page 6

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

DIAGRAM 5

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is open, with no obstruction to flow of flood waters (open lattice work and/or readily removable insect screening is permissible).

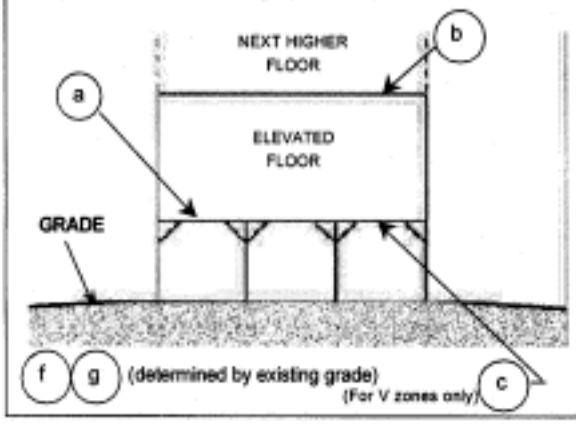


DIAGRAM 6

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

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about openings in Section C, Building Elevation Information (Survey Required).

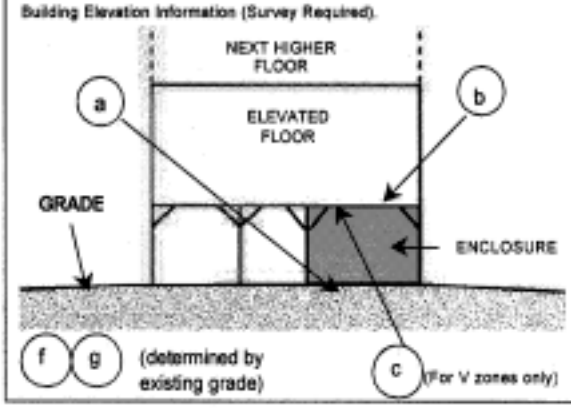


DIAGRAM 7

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

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about openings in Section C, Building Elevation Information (Survey Required).

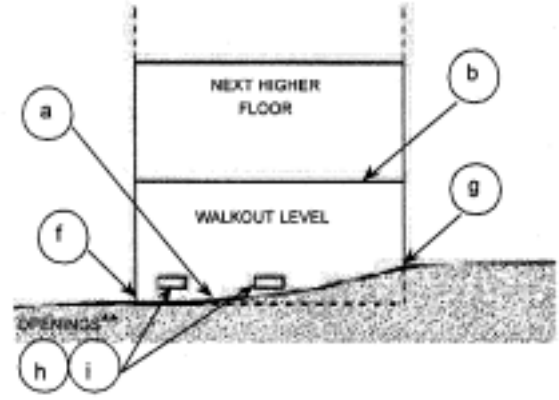
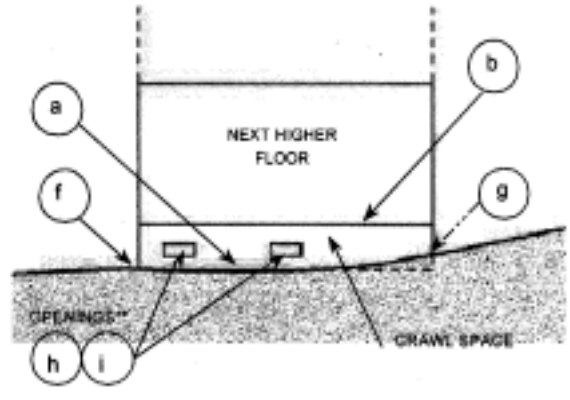


DIAGRAM 8

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

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawl space is with or without openings** present in the walls of the crawl space. Indicate information about the openings in Section C, Building Elevation Information (Survey Required).



** An "opening" (flood vent) is defined as a permanent opening in a wall that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawl spaces with a total net area of not less than one square inch for every square foot of area enclosed. Each opening must be on different sides of the enclosed area. If a building has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to directly enter. The bottom of the openings must be no higher than one foot above the grade underneath the flood vents. Alternatively, you may submit a certification by a registered professional engineer or architect that the design will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening.

Instructions – Page 7

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

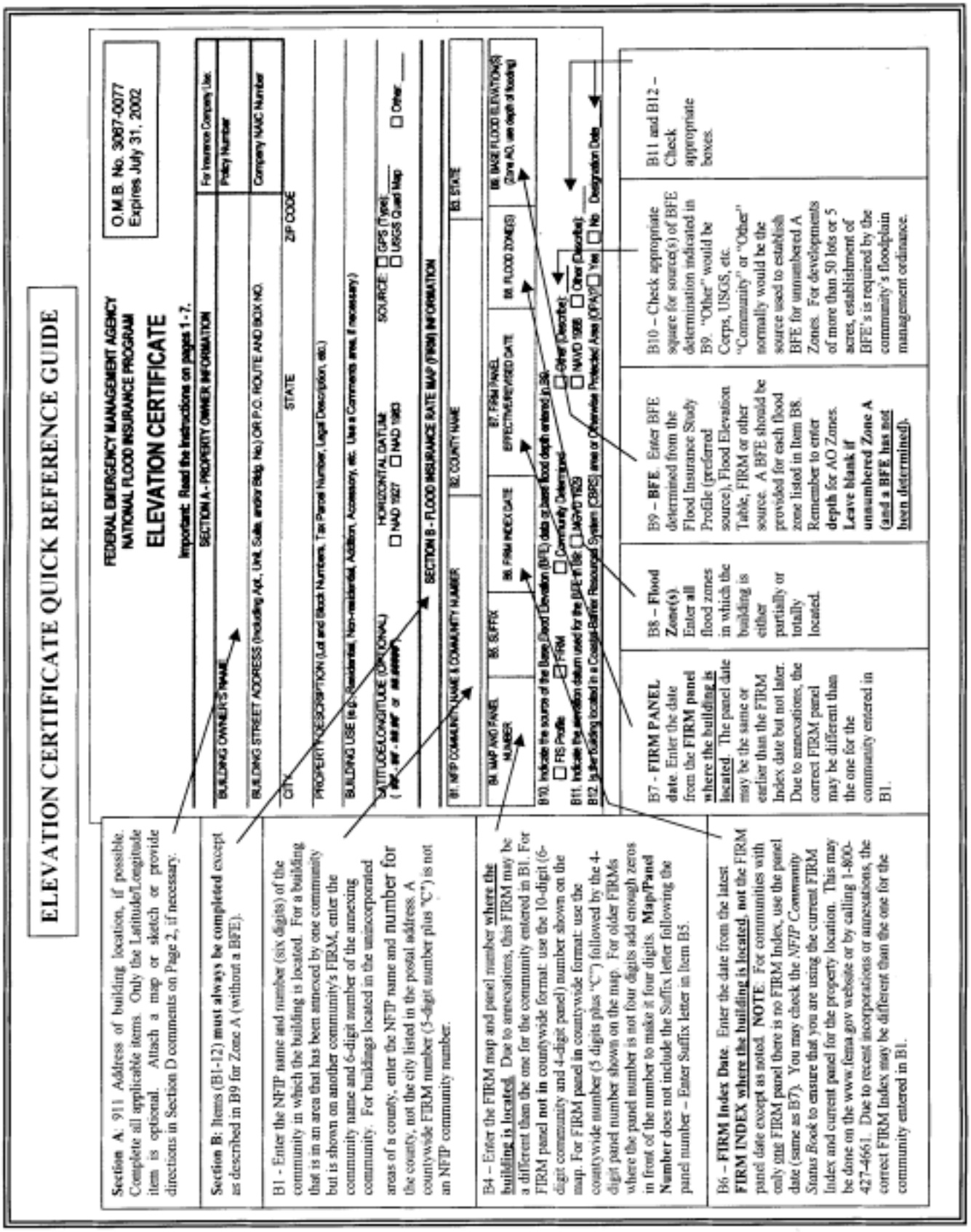


Figure 310-3a. Elevation Certificate Quick Reference Guide for CRS Communities, page one.

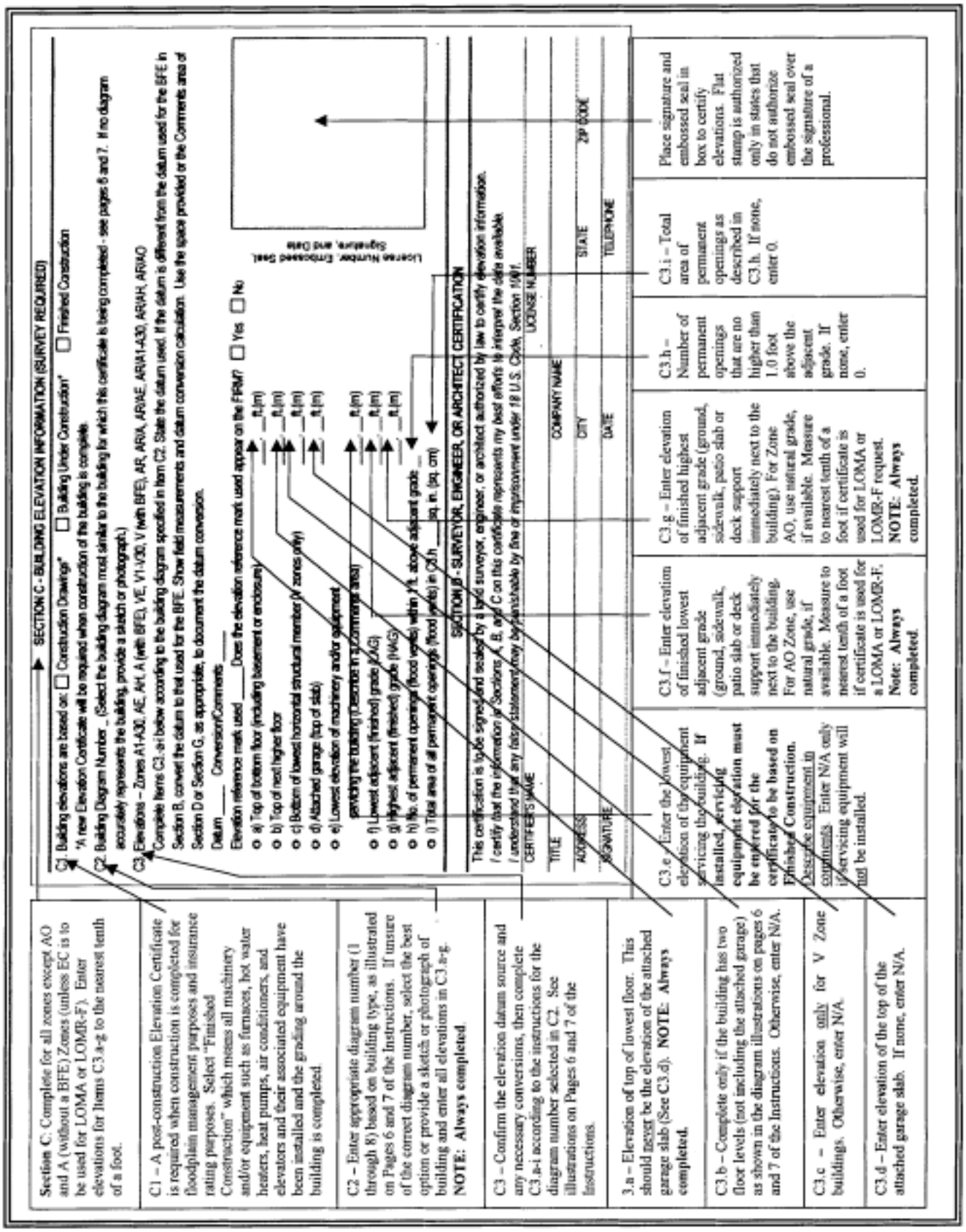


Figure 310-3b. Elevation Certificate Quick Reference Guide for CRS Communities, page two.

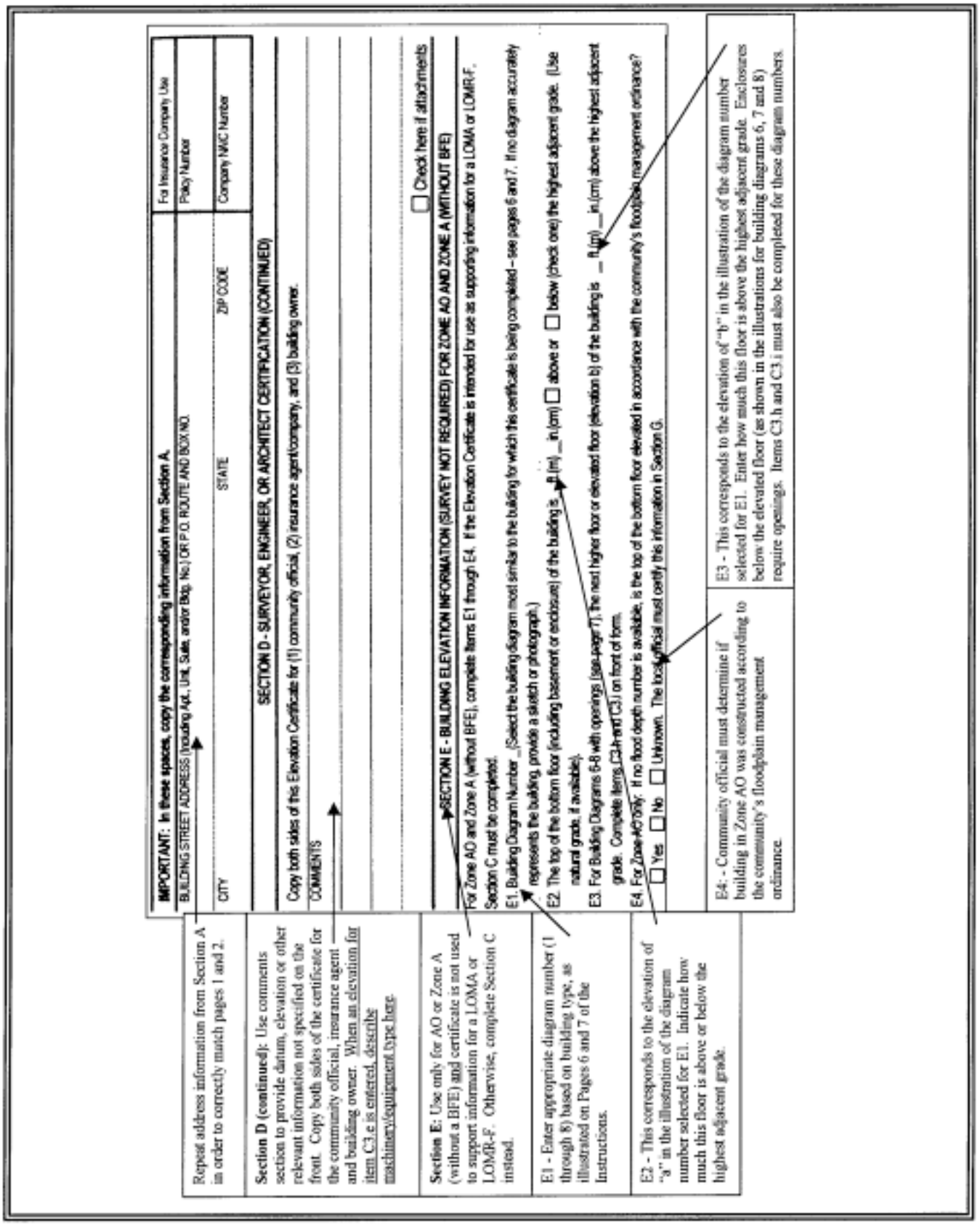


Figure 310-3c. Elevation Certificate Quick Reference Guide for CRS Communities, page three.

Section F: Certification of property owner or owner's representative who completes Sections A, B, C (Items c3.h and c3.i only) and E for Zone A (without a BFE). The address indicated must be the actual mailing address of the property owner or representative who provided the information on the certificate. If a community official completes Section E, certification is done 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, C (Items C3.h and C3.i only), 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, C, 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: 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. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

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.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local 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 is: ___.__ ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ___.__ ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME TITLE

COMMUNITY NAME TELEPHONE

SIGNATURE DATE

COMMENTS

☐ Check here if attachments

Check Item **C2**. 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.

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 - 9 – Complete as indicated to determine if a structure has been built in accordance with your community's floodplain management ordinance.

Enter all the listed information for the community official. Official must sign and date the certificate.

Enter comments as necessary. When items G4-G9 are completed, the local official can use the comment section to document building compliance for building features such as machinery/equipment and openings

Check here if attachments

Figure 310-3d. Elevation Certificate Quick Reference Guide for CRS Communities, page four.

Guidance for Verifying Building Compliance Using the FEMA Elevation Certificate (July 2000)

Section C of the Elevation Certificate records the elevation of various building components, but does not determine the "as built" lowest floor of the building or indicate whether the building, as constructed, complies with the community's floodplain management ordinance. The determination of the "as built" lowest floor for compliance with the community's floodplain management ordinance is the responsibility of the local floodplain management official. The local official can document the "as built" lowest floor in item G8. Use the following guidance for each diagram to determine which level is the lowest floor the community should be documenting in item G8.

Diagram Description	"As Built" Lowest Floor Determination
Diagram 1: Slab-on-grade buildings.	A Zones: C3.a, top of bottom floor. V Zones: See Note 1.
Diagram 2: Buildings with basement.	A Zones: C3.a, top of bottom floor (including basement). V Zones: See Note 1.
Diagram 3: Split-level slab-on-grade buildings.	A Zones: C3.a, top of bottom floor. V Zones: See Note 1.
Diagram 4: Split-level buildings other than slab-on-grade.	A Zones: C3.a, top of bottom floor (including basement) V Zones: See Note 1.
Diagram 5: Buildings elevated on piers, posts, piles, columns, or parallel shear walls (no obstructions, but open lattice and/or screening is permissible).	A Zones: C3.a, top of elevated floor. V Zones: C3.c, bottom of lowest horizontal structural member of the elevated floor (see Note 1)
Diagram 6: Buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure.	A Zones: If the enclosure has proper openings AND is used as parking, building access, or storage (see Note 2): C3.b, top of elevated floor If the enclosure does NOT have proper openings OR is used for something other than parking, access, or storage: C3.a, floor of enclosure V Zones: If the enclosure's walls are breakaway AND the enclosure is used for parking, building access, or storage (see Note 3): C3.c, bottom of lowest horizontal structural member of the elevated floor If the enclosure's walls are NOT breakaway OR the enclosure is used for something other than parking, access or storage: C3.a, floor of enclosure
Diagram 7: Buildings elevated on full-story foundation walls with partial or full enclosure.	A Zones: If the walkout level (enclosure) has the proper openings AND is used as parking, building access, or storage (see Note 2): C3.b, next higher floor If the walkout level (enclosure) does NOT have the proper openings OR is used as a finished living space: C3.a, floor of walkout level V Zones: See Note 1.

Figure 310-4a. Guidance for verifying building compliance using the FEMA elevation certificate, page one.

Diagram 8: Buildings elevated on crawl space. (See Note 4 on differentiating between a crawlspace and a basement.)	A Zones: If the crawl space enclosure has the proper openings (see Note 2) 3.b, next higher floor. If the crawl space enclosure does NOT have the proper openings: C3.a, floor of crawl space. V Zones: See Note 1.
Attached Garage (when garage floor is below the Base Flood Elevation):	If the garage has the proper openings (see Note 2), then use the guidance above. If the building has an attached garage that does NOT have the proper openings, then the garage floor (C3.g) is the "lowest floor" that should be identified in G8.
Equipment: Under the NFIP, buildings must be constructed with electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. Generally, this is done by elevating equipment above the Base Flood Elevation, but there are ways to floodproof equipment to keep water out.	Even though the building may be properly elevated based on the "as built" lowest floor, it is not a compliant building unless the equipment is properly elevated or floodproofed. See also *Protecting Building Utilities From Flood Damage*, FEMA-348, 2000. It can also be viewed and downloaded from www.fema.gov/library/lib06b.htm

Note 1. V Zone buildings that are constructed similar to Diagrams 1-4, 7 and 8, are violations under the NFIP. For these buildings the lowest floor is measured at the bottom of the lowest horizontal structural member which will be the bottom of the slab or a footing.

Note 2. Enclosures and Openings in A Zones (Diagrams 6, 7, and 8). The NFIP Floodplain Management Regulations permit limited uses of enclosures below the lowest floor. The enclosed area below an elevated building cannot be used for something other than parking of vehicles, building access, or storage. The enclosure must be built with flood resistant materials. The enclosed areas below an elevated building must contain openings. An opening is defined as: *A permanent opening in a wall that allows for the free passage of water automatically in both directions without human intervention.* Openings are explained at the bottom of page 7 of the Elevation Certificate. The number and total area of openings are provided in C3.h and i. The floor area should be on the permit plans.

Note 3. In V Zones, an enclosure (as shown in Diagram 6) must be constructed with non-supporting, non-load bearing breakaway walls which meet applicable NFIP criteria. The enclosure can only be used for parking of vehicles, building access and storage and cannot be used for something other than parking, building access or storage. The enclosure must be built with flood resistant materials.

Note 4. Crawl Space Construction (Diagram 8): If the floor of the crawl space is below the Base Flood Elevation, NFIP requirements can be met by ensuring that the interior floor of the crawl space is at or above the lowest adjacent grade to the building. If the floor of the crawl space is below the Base Flood Elevation and the interior floor of the crawl space is below the adjacent grade on the exterior of the building, it is considered a "basement" and diagram 2 or 4 must be used for determining the lowest floor.

Figure 310-4b. Guidance for verifying building compliance using the FEMA elevation certificate, page two.

O.M.B. NO. 3067-0077
Expires July 31, 2002

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

FLOODPROOFING CERTIFICATE

FOR NON-RESIDENTIAL STRUCTURES

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.

FOR INSURANCE COMPANY USE
POLICY NUMBER
COMPANY NAIC NUMBER

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

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)

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.)

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

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

FEMA Form 81-65, AUG 99 Replaces all previous editions F-056 (8/99)

Figure 310-5. FEMA's floodproofing certificate.

FEDERAL EMERGENCY MANAGEMENT AGENCY
RESIDENTIAL BASEMENT FLOODPROOFING CERTIFICATE

See Reverse Side for Paperwork Burden Disclosure

O.M.B. No. 3067-0235
Expires June 30, 1998

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
POLICY NUMBER

BUILDING STREET ADDRESS (Including Apt., Unit, 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)

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.)

Elevation of the top of the basement floor is ___ ___ ___ ___ ___ . ___ feet NGVD.

(NOTE: The floodproofing design elevation must be at least one foot above the Base Flood Elevation (BFE).)

SECTION III-CERTIFICATION (By a Registered Professional Engineer or Architect)

Residential Floodproofed Basement Construction Certification:

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, that 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:

- Basement area, 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
- 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
- Building design, including the floodproofing design elevation, complies with community requirements.

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

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, Feb 97

NATIONAL FLOOD INSURANCE PROGRAM
000200 (7/97)

Figure 310-6. FEMA's residential basement floodproofing certificate.

Communities Approved for Residential Basement Floodproofing Rating Credit

STATE/COMMUNITY NAME	EFFECTIVE DATE[1]	STATE/COMMUNITY NAME	EFFECTIVE DATE[1]
Alaska		**New York**	
Fairbanks	2/28/73	Amherst	11/20/78
Idaho		Clarence, Town of	8/1/00
Ammon	6/8/90	**North Dakota**	
Iowa		Barnes Township	1/22/82
Clive	4/24/81	Casselton	6/18/81
Independence	9/7/89	Fargo	3/26/75[2]
LaPorte City	6/12/89	Grafton	5/21/81
Kansas		Harwood	12/19/85
Colwich	1/17/86	Harwood Township	1/22/82
Derby	2/15/83[2]	Horace	1/22/82
Great Bend	8/10/83	Mapleton	1/22/82[2]
Halstead	7/8/83	Oxbow	6/1/92[2]
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[2]	West Fargo	6/5/78
Minnesota		**South Dakota**	
Alvarado	2/28/85	Madison	8/30/83
Caly County	3/28/75	**Wisconsin**	
Dilworth	8/29/83	Ashwaubenon	10/27/78
East Grand Forks	5/15/85[2]	Brown County	2/21/79[2]
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
Nebraska		Village of Allouez	1/11/93[2]
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		

[1] Effective date corresponds to the date of FIMA's letter to the community granting the exception request.
[2] The date the community adopted floodproofing ordinances.

Source: "Flood Insurance Manual" (for insurance agents), October 1, 1998.

Figure 310-7. Communities approved for residential basement floodproofing rating credit.

320 MAP INFORMATION

Summary of Activity 320

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

Map information (MI): 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,
4. keeps old FIRMs and updates the maps used for the service, and
5. publicizes the service at least once a year . The publicity must be sent either to all local lenders, real estate offices, and insurance agents or to all properties in the community.
6. advises inquirers whether the property is subject to a special flood-related hazard.

There is no impact adjustment for this activity.

322 Credit Calculation. 140 credit points are provided for this activity.

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 address or location of the property in question, and whether the inquirer was advised of the insurance purchase requirement and/or coastal barrier designation.

e. Documentation showing how the FIRM is kept updated. The community must maintain copies of the FIRMs.

324 For More Information.

320 MAP INFORMATION

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 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.

Activity Description: There are six prerequisites for credit under this activity:

1. If requested, the community must provide all of the following Flood Insurance Rate Map (FIRM) information:

   a. Whether the property is in a Special Flood Hazard Area,

   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, and

   g. The elevation datum used on the FIRM, if other than NGVD.

   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 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.

3. If the FIRM shows the property to be in an “undeveloped coastal barrier” or “otherwise protected area” of the Coastal Barrier Resources System, 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.

4. The map used for this service must be kept updated to reflect new subdivisions, 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 to the CRS, whichever is later.

5. The service must be publicized at least once a year.

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.

There are many benefits to providing FIRM information. Residents and businesses who 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, flood insurance, and property protection measures.

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; or
- Completing a form based on a marked-up street map sent in by an inquirer (see example, Figure 320-1).

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

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 (see Sections 323.a, c, and d).

The following comments correspond to the six prerequisites described in the *Schedule*, above.

1. The list in Section 1 of the Activity Description comprises the FIRM information needed to complete most of Section B of the Federal Emergency Management Agency’s (FEMA’s) 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 a floodplain or FIRM zone decision cannot be made based on the map information available. ***NOTE:*** *A community may use a Q3 version of its FIRM. However, if it is a close call, it must refer to the paper FIRM to decide the FIRM zone before advising inquirers to make their own decisions.*

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 an insurance agent. Agents can get information from the U.S. Fish and Wildlife Service through flood insurance channels.

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 a request for information 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 flood insurance purchase requirement. The flood insurance purchase requirement is explained in more detail in Figure 320-2.

   An example of a note informing the inquirer about the flood insurance purchase requirement is in Figure 320-1. An alternative is to provide a summary similar to that in the booklets FEMA-186 and FIA-2, listed in Section 324, For More Information. This may be easier for the community to do, but it does not necessarily help people who have trouble reading technical material or who want simple answers to simple questions. A third alternative is to hand out a one-page summary such as the example in Figure 320-2.

   Communities should be aware that lenders are legally responsible for determining if a flood insurance policy is required for a loan. Under the recently enacted National Flood Insurance Reform Act, if 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. This activity credits providing map information to inquirers. It is not intended to encourage communities to assume the lender's responsibility.

3. "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. 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 and the limits on federal assistance.

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. The base flood elevation at the property is: _____, NGVD. Federal law requires that a flood insurance policy be obtained as a condition of a federally-backed mortgage or loan that is secured by the building. It is up to the lender to determine whether flood insurance is required for a property. Flood insurance is available in Floodville. More information on flood insurance is attached.

___ 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 is available and may be obtained at non-floodplain rates. A flood insurance policy may 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.

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. This letter does not create liability on the part of the City, or any officer or employee thereof, for any damage that results from reliance on this information.

_____
Building Official

Figure 320-1. 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.*

Flood Insurance

NFIP: This community participates in the National Flood Insurance Program (NFIP). The NFIP makes federally backed flood insurance available for all 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: structural and contents. Structural coverage is for the walls, floors, insulation, furnace, and other items permanently attached to the structure. Contents coverage may be purchased separately provided the contents are in an insurable building.

Mandatory Purchase Requirement: The mandatory purchase requirement applies to all forms of federal or federally related financial assistance for buildings located in a Special Flood Hazard Area (SFHA). This requirement affects loans and grants for the purchase, construction, repair, or improvement of any publicly or privately owned building in the SFHA, including machinery, equipment, fixtures, and furnishings contained in such buildings.

Financial assistance programs affected include loans and grants from agencies such as the Department of Veterans Affairs, Farmers Home Administration, Federal Housing Administration, Small Business Administration, and Federal Emergency Management Agency. The requirement also applies to secured mortgage loans from financial institutions, such 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.

How it Works: Before a person can receive a loan or other financial assistance from one of the affected agencies or lenders, there must be a check to see if the building is in a Special Flood Hazard Area (SFHA). 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.”

Copies of the FIRM are available for review in most local government building or planning departments. Many lenders and insurance agents also have copies. It is the agency’s or the lender’s responsibility to check the FIRM to determine if the building is in an SFHA, although many communities provide assistance.

If the building is in a SFHA, the agency or lender is required by law to require the recipient to purchase a flood insurance policy on the building. The requirement is for structural coverage equal to the amount of the loan (or other financial assistance) or the maximum amount available, whichever is less. The maximum amount available for a single-family house is $250,000.

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 the SFHA, even though a portion of the lot may be floodprone. 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 Flood Insurance Rate Map.

Figure 320-2. Handout on mandatory purchase of flood insurance.

Communities with designated undeveloped coastal barriers should determine the date(s) at 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 or by contacting the U.S. Fish and Wildlife Service. The CBRA provisions are summarized in Figure 320-3.

4. The community must use the latest Flood Insurance Rate Map. The community is responsible for ensuring that the map 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 Map Revision (LOMR) or noting on the paper FIRM that LOMAs and LOMRs have been issued.

   The community must also maintain copies of old FIRMs that have been in effect since 1999 or the date the community applied to the CRS, 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 old FIRMs may be available from the Map Coordination Contractors (see Section 324.e).

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

5. The map information service must be publicized at least once a year. Publicity of the service need only be directed at the 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) An annual mailing (or e-mail) to all local lenders and insurance and real estate agencies. If the community or the Chamber of Commerce has a newsletter that reaches all the appropriate offices, a notice in the newsletter will suffice

   b) An annual mailing (or e-mail) to appropriate organizations, such as the local Board of Realtors®, the local chapter of the American Bankers Association, or the state's insurance department if these organizations agree to publicize the service to their members or constituency via a newsletter or other media.

   c) A third method is to advise everyone about the map information service. This may be done 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).

The Coastal Barrier Resources System

The Coastal Barrier Resources Act of 1982 (CBRA), and later amendments, 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 units or "otherwise protected areas." They are colloquially called "CBRA zones." (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 CBRA. 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 zones—there are no loans or grants to repair or rebuild buildings in those areas.

CBRA also banned the sale of National Flood Insurance Program 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 zone was identified. CBRA zones and their identification dates are shown in the legend of Flood Insurance Rate Maps (FIRMs).

If an owner of a building in a CBRA zone wanted 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 would provide more information on the format for this documentation.

The boundaries of the CBRA zones 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, Fish and Wildlife Service, or
- Cartographic modifications by the Federal Emergency Management Agency 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 zone, 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 with flood insurance is substantially improved or substantially damaged, the policy will be cancelled.

Banks can only make conventional loans. While they cannot require flood insurance on newer buildings in CBRA zones, lenders are required to notify borrowers of the flood hazard and the lack of disaster assistance. Many lenders are reluctant to lend without protecting their investment with flood insurance and private flood insurance is not readily available.

Figure 320-3. Provisions of the Coastal Barrier Resources Act.

These publicity methods are described in more detail in Section 323, Credit Documentation. The second method would be more efficient and economical 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. The publicity that advises insurance agents of the map information service must also tell them about the availability of elevation certificates.

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 on each hazard. 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.

321 Credit Points

Maximum credit for Activity 320: 140 points

Map Information: MI = 140 points if the community or other qualified agency provides FIRM information to inquirers, provides information on the flood insurance purchase requirement, and publicizes the service.

Credit is dependent upon both providing and publicizing the service. If the documentation of publicity does not meet the requirements of Section 323, c320 = zero. 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 320-1 is completed and signed by the building official. The form is provided after the inquirer pays a fee of $15. 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 (NFIP). Floodville also prepared a flyer based on the information in Figure 320-2. 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 x 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.

1. If the community sends a letter or e-mail to lending institutions and real estate and insurance agencies, a copy of the letter or e-mail message. The publicity that advises insurance agents of the map information service must also tell them about the availability of elevation certificates.

2. If the community notifies organizations of lending institutions and real estate and insurance agencies, copies of the notifications in their publications. If any organization(s) has not yet published the notifications, documentation must include written assurance from the organization(s) that it (they) intends to publish the notification within six months of the Community Rating System (CRS) application date. The publicity that advises insurance agents of the map information service must also tell them about the availability of elevation certificates.

3. If the community publicizes this service through an annual outreach project credited under Activity 330 (OPC or OPS), the activity worksheet, AW-320, must note that the publicity materials are 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.

4. 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 target audience.

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. If the map information service were publicized in that brochure, it would meet the publicity requirement for this activity.

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.

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 the date, the address or location of the property in question, the FIRM zone, and whether the inquirer was advised of the rules on mandatory flood insurance purchase and designated coastal barriers.

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 320-1. A log is required if information is given orally or on the telephone. A sample log is shown in Figure 320-4. Copies of the log or letters are also required if another agency provides the map information.

LOG OF WALK-IN AND TELEPHONE MAP INFORMATION INQUIRIES

DATE	TYPE	ADDRESS	PANEL	ZONE	ELEV	INSURANCE PURCHASE REQUIREMENT	DESIGNATED COASTAL BARRIER
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

Figure 320-4. Sample log for a map information service.

NOTE: *Communities that do not have undeveloped coastal barriers designated on their FIRMs do not need the last column on the log.*

e. Documentation showing how the community keeps the FIRM updated to reflect new subdivisions, 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 to the CRS, whichever is later.

324 For More Information

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

Answers to 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, May 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.htm.)

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 System can be found on the U.S. Fish and Wildlife Service's website at http://www.fws.gov/cep/cbrtable.html.

e. Communities may check on past FIRMs with the FEMA Map Coordination Contractors.

Check the following website: http://www.floodmaps.net/mit/tsd/ST_order.htm or

Regions I–IV
Flood Insurance Study Information Specialist
2977 Prosperity Avenue
Fairfax, VA 22031
Fax: (703) 876-0073
Map.Specialist@dewberry.com

Regions V–VII
Flood Insurance Study Information Specialist
12101 Indian Creek Court
Beltsville, MD 20705
Fax: (301) 210-5435
mapspecialist@pbsj.com

Regions VIII–X
Flood Insurance Study Information Specialist
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304
Fax: (703) 329-3023
bakermail@mbakercorp.com

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*. http://www.fema.gov/mit/tsd/dl_comp.htm.

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330 OUTREACH PROJECTS

Summary of Activity 330

331 Credit Points. There are four elements in this activity for a maximum of 315 points. Their credit points are partially based on the number of topics covered by each outreach project.

a. Outreach projects to the entire community (OPC): Up to 60 points are provided for sending written information to all properties in the community through a mailing or newsletter.

b. Outreach projects to the floodplain properties (OPF): Up to 130 points are provided for sending a notice directed to properties in floodprone areas. The notice must clearly explain that the recipient's property is subject to flooding.

c. 1. Additional outreach projects (OPA): Up to 60 points are provided for conducting up to three additional outreach projects, such as a "flood awareness week" or flyers inserted in local newspapers, that will reach some of the population. OR

2. Outreach projects pursuant to a public information program strategy (OPS): Up to 125 points are provided for implementation of additional projects that are identified in a public information program strategy. There is no OPA credit if the community receives credit for OPS.

332 Credit Calculation. The credit points for each element are totalled.

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

a. Copies of the notices, flyers, and other materials used in the outreach projects.

b. [If the community applies for credit under Section 331.c.2] A copy of the public information program strategy document and documentation that it is being implemented by the community.

c. Documentation that shows when the outreach projects are undertaken.

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

d. Copies of the community's outreach projects that were conducted that year.

e. [If the community applies for credit under 331.c.2] A copy of the annual evaluation of the community's public information program strategy.

334 For More Information.

330 OUTREACH PROJECTS

NOTE: *A separate publication,* ***CRS Credit for Outreach Projects****, 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 advising people of the flood hazard, the availability of flood insurance, and/or flood protection methods.

Background: Just notifying people that they are exposed to a flood hazard can help motivate them to purchase flood insurance or protect their properties.

Research has proven that awareness of the hazard is not enough; people need to be told what they can do about it. Research has also shown that a properly run local information program is more effective than national advertising or publicity campaigns.

Activity Description: This activity credits public information projects that reach out to people, rather than a service to respond to inquiries. To receive credit under this activity, a community may do one or more of four types of projects:

a. Send written information to all properties in the community through a newsletter, utility bill, telephone book, or other document that is sent to all properties.

b. Send a notice directed to properties in floodprone areas. The notice must be distributed to all properties in the Special Flood Hazard Area (SFHA) and those additional areas known to have flooding problems. The notice must clearly explain that the recipient's property is in or near an area subject to flooding.

c. EITHER:

   1. Conduct other outreach projects, such as a "flood awareness week" or flyers inserted in local newspapers, that will reach some of the population; OR

   2. Conduct other outreach projects pursuant to a locally prepared public information program strategy.

Several other activities have publicity requirements that may be met with an outreach project that is credited under this activity. These include Activities 320 (Map Information), 360 (Flood Protection Assistance), 510 (Floodplain Management Planning), 540 (Drainage 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: 315 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. The first five are considered more important to the goals of the CRS and they are given more points in this activity.

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/damage requirements.
10. Drainage system maintenance (required for full credit 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 for 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 this 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 names of the rivers, information about past floods, and additional data on local flooding, such as velocities or the possibility of mudflows. If the community provides map or additional flood hazard information as credited under Activities 320 (Map Information) or 360 (Flood Protection Assistance), the service could be publicized under this topic.

2. **Flood safety:** Emergency precautions, such as turning off the electricity and gas and avoiding running washes or unstable banks, should be discussed. This topic must be covered if the community is applying for credit for emergency warning dissemination under Activity 610 (Flood Warning Program).

3. **Flood insurance:** The project should note that flooding is not covered by standard property insurance but that flood insurance is available in the community. It should include some basic facts, such as types of coverage and the 30-day waiting period before coverage goes into effect. If the community has any undeveloped coastal barriers where insurance may not be available, it should be discussed. 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.c).

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 Figure 530-2. 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.c).

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.

   b. The floodprone area must be clearly shown through shading or another method.

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 also 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 requirement (which is in the community's floodplain management regulations) and the local procedures for enforcing it. More information on the substantial improvement and substantial damage rules can be found in "Answers to Questions about Substantially Damaged Buildings," FEMA-213/May 1991 (see Section 334.d).

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 example in Figure 330-1).

The 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 direct mailing to floodplain residents was as effective as more expensive combinations of mailing, 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 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 the hazard 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.

9. A comprehensive program that reinforces the message from several sources at the local level is more productive.

The extra effort to prepare a locally appropriate series of outreach projects will pay off as property owners purchase insurance and protect their buildings. Success in this effort can also be credited by the CRS under Activity 530 (Flood Protection). More credit is provided for direct mailing to floodplain properties because research has shown it to be the most effective in motivating people to insure or floodproof their properties.

a. Outreach projects to the entire community (OPC) (Maximum credit: 60 points)

OPC = the sum of the points for each topic covered in written information sent to all properties in the community through a newsletter, utility bill, telephone book, or other document sent to everyone. A newspaper may be used if the information is not in a legal notice, small classified ad, or similar obscure location.

The project must cover one or more topics at least once a year to at least 90% of the properties in the community. Some topics are worth eight points and some are worth four points:

Eight points	Four points
The local flood hazard	Map of the local flood hazard
Flood safety	Flood warning system
Flood insurance	Floodplain development permit requirements
Property protection measures	Substantial improvement/damage requirements
Natural and beneficial functions	Drainage system maintenance

The topics do not all have to be covered in the same distribution, but the distribution must ensure that the topics credited are covered at least once each year. For example, a community with a quarterly newsletter may cover two topics in each edition and be credited for covering eight each year.

There is no impact adjustment for this activity. For this credit, the outreach project must be sent to at least 90% of the properties in the community. “Properties” can be counted as utility customers, tax parcels, or other measure that approximates all of the addresses in the community. Vacant lots need not be counted.

Generally a distribution to all taxpayers, water customers, or property owners is considered 100% distribution. A commercial newspaper can only be counted if the community can document that it reaches 90% of the properties in the community.

Example 331.a-1. Floodville mails a flood protection information flyer to all community properties every year. A copy is shown in Figure 330-1. It is marked to show where each topic is covered. The flyer covers six topics: the local flood hazard (8 points), flood safety (8 points), flood insurance (8 points), property protection (8 points), floodplain development permit requirements (4 points), and drainage system maintenance (4 points). This flyer also meets the publicity requirements for Activity 360 (Flood Protection Assistance) and Activity 540 (Drainage System Maintenance). OPC = 8 +8 + 8 + 8 + 4 + 4 = 40

City of Floodville
Flood Protection Information

OPC

Flooding in our city is caused by three sources: Foster Creek leaves its banks during heavy storms, snowmelt or ice jams. Floodwaters can cover many blocks up to four or five feet deep. The Southeast Ditch and Deadman's Run are smaller streams which flood during or soon after heavy storms. Floodwaters are not as deep, but they still cover streets and yards and can flood cars, garages, basements and lower floors.

Flooding in all three areas can come with little warning. An ice jam on Foster Creek in 1982 covered streets within 15 minutes of forming. In July 1986, Southeast Ditch and Deadman's Run flooded within an hour after a thunderstorm started. Floods are also dangerous. Even though they appear to move slowly (three feet per second), a flood two feet deep can knock a man off his feet and float a car.

Your property may be high enough that it was not flooded recently. However, it can still be flooded in the future because the next flood could be worse. If you are in the floodplain, the odds are that someday your property will be damaged. This flyer gives you some ideas of what you can do to protect yourself.

Local Flood

City Flood Services: The first thing you should do is check your flood hazard. Flood maps and flood protection references are available at the Floodville Public Library. You can also visit the Building Department on the first floor of City Hall to see if you are in a mapped floodplain. If so, they can give you more information, such as depth of flooding over a building's first floor and past flood problems in the area. They also have a handout on selecting an architect, engineer, or contractor.

If requested, the Public Works Department will visit a property to review its flood problem and explain ways to stop flooding or prevent flood damage. Call the Department at 555-1234. These services are free. If you are in a floodplain or have had a flood, drainage or sewer backup problem, check out these sources of assistance.

FPA-360

What You Can Do: Several of the City's efforts depend on your cooperation and assistance. Here is how you can help:

- Do not dump or throw anything into the ditches or streams. Dumping in our ditches and streams is a violation of Floodville City Ordinance 21.35. Even grass clippings and branches can accumulate and plug channels. A plugged channel cannot carry water and when it rains the water has to go somewhere. Every piece of trash contributes to flooding.
- If your property is next to a ditch or stream, please do your part and keep the banks clear of brush and debris. The City has a stream maintenance program which can help remove major blockages such as downed trees.
- If you see dumping or debris in the ditches or streams, contact the Public Works Department at 555-1234.
- Always check with the Building Department before you build on, alter, regrade, or fill on your property. A permit may be needed to ensure that projects do not cause problems on other properties.
- If you see building or filling without a City permit sign posted, contact the Building Dept. at 555-1234.
- Check out the following information on floodproofing, flood insurance and flood safety.

Property Protection

Floodproofing: There are several different ways to protect a building from flood damage. One way is to keep the water away by regrading your lot or building a small floodwall or earthen berm. These methods work if your lot is large enough, if flooding is not too deep, and if your property is not in the floodway. The Building Department can provide this information.

Another approach is to make your walls waterproof and place watertight closures over the doorways. This method is not recommended for houses with basements or if water will get over two feet deep.

Figure 330-1a. Floodville's outreach project to the community.

A third approach is to raise the house above flood levels. A small wood frame house can be elevated for less than $10,000. Sound crazy? Check out some of the houses on St. Mary's Road near 40th Street. The owners had a contractor raise their homes three feet for under $6,000 each. The owners did the stairs, the deck, and the landscaping themselves. In 1988, the Foster Creek flood went under these houses without damaging them.

Many houses, even those not in the floodplain, have sewers that back up into the basement during heavy rains. A plug or standpipe can stop this if the water doesn't get more than one or two feet deep. They can be purchased at a hardware store for under $25. For deeper sewer backup flooding, talk to a plumber about overhead sewers or a backup valve. Last year five Floodville homes got overhead sewers or backup valves.

These measures are called floodproofing or retrofitting. More information is available at the Floodville Public Library. *Important note:* Any alteration to your building or land requires a permit from the Building Department. Even regrading or filling in the floodplain requires a permit.

If you know a flood is coming, you should shut off the gas and electricity and move valuable contents upstairs. It is unlikely that you will get much warning, so a detailed checklist prepared in advance would help ensure that you don't forget anything.

Flood Insurance: If you don't have flood insurance, talk to your insurance agent. Homeowner's insurance policies do not cover damage from floods. However, because Floodville participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal government and is available to everyone, even for properties that have been flooded.

Some people have purchased flood insurance because it was required by the bank when they got a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. During the kind of flooding that happens in Floodville, there is usually more damage to the furniture and contents than there is to the structure.

At last count, there were 55 flood insurance policies in Floodville. If you are covered, check out the amount and make sure you have contents coverage. Remember: Even if the last flood missed you or you have done some floodproofing, the next flood could be worse. Flood insurance covers all surface floods.

> Don't wait for the next flood to buy insurance protection. There is a 30-day waiting period before National Flood Insurance Program coverage takes effect. Contact your insurance agent for more information on rates and coverage.

Flood Safety

Do not walk through flowing water. Drowning is the number one cause of flood deaths, mostly during flash floods. Currents can be deceptive; six inches of moving water can knock you off your feet. If you walk in standing water, use a pole or stick to ensure that the ground is still there.

Do not drive through a flooded area. More people drown in their cars than anywhere else. Don't drive around road barriers; the road or bridge may be washed out.

Stay away from power lines and electrical wires. The number two flood killer after drowning is electrocution. Electrical current can travel through water. Report downed power lines to the Power Company or City emergency management office.

Have your electricity turned off by the Power Company. Some appliances, such as television sets, keep electrical charges even after they have been unplugged. Don't use appliances or motors that have gotten wet unless they have been taken apart, cleaned, and dried.

Look out for animals, especially snakes. Small animals that have been flooded out of their homes may seek shelter in yours. Use a pole or stick to poke and turn things over and scare away small animals.

Look before you step. After a flood, the ground and floors are covered with debris including broken bottles and nails. Floors and stairs that have been covered with mud can be very slippery.

Be alert for gas leaks. Use a flashlight to inspect for damage. Don't smoke or use candles, lanterns, or open flames unless you know the gas has been turned off and the area has been ventilated.

Figure 330-1b. Page two of Floodville's outreach project to the community.

b. Outreach projects to floodplain properties (OPF) (Maximum credit: 130 points)

OPF = the sum of the points for each topic covered in written information sent to all properties in the community's floodprone areas. The notice must be distributed to all properties in the SFHA and other areas known to have flood problems. The notice must clearly explain that the recipient's property is subject to flooding.

The project must cover one or more topics at least once a year to at least 90% of the properties in the floodplain. Some topics are worth 17 points and some are worth 9 points:

17 points	9 points
The local flood hazard	Map of the local flood hazard
Flood safety	Flood warning system
Flood insurance	Floodplain development permit requirements
Property protection measures	Substantial improvement/damage requirements
Natural and beneficial functions	Drainage system maintenance

The project must clearly tell the readers that their properties are subject to flooding (e.g., a letter that begins: "Your property is in or near the flood hazard area as mapped by the Federal Emergency Management Agency"). There is no impact adjustment for this activity. For this credit, the outreach project must be sent to at least 90% of the properties in the floodplain. "Properties" are counted the same way as in 331.a, Outreach Projects to the entire Community.

Repeated messages have been shown to be more effective so multiple projects are encouraged. A 100% floodprone community can receive credit for OPF, but cannot receive OPC credit for the same mailing even though it goes to the entire community. If the community does two mailings in the same year, it can receive OPC credit for the second mailing.

Example 331.b-1. A brochure was prepared by a regional drainage and flood control district. Floodville mails it to each floodplain resident. The brochure identifies the flood hazard by naming the streams, showing their floodplains on a map, and noting they are subject to flash flooding, a hazard that provides little warning. At the beginning, the reader is told, "You are located in or very near the flood hazard area."

Because the objective of this outreach project is to advise people of the safety threat, it does not discuss property protection or permit requirements. This brochure is credited for covering five topics: the local flood hazard (17 points), local flood hazard map (9 points), flood warning (9 points), flood safety (17 points), and flood insurance (17 points):

OPF = 17 + 9 + 9 + 17 + 17 = 69

c. EITHER:

1. Additional outreach projects (OPA) (Maximum credit: 60 points)

OPA = 2 for each topic covered in additional outreach projects, such as a "flood awareness week" or flyers inserted in local newspapers. Credit for a community website may be received under either this element or under Activity 350 (Flood Protection Information), but not both.

A community can earn a maximum of 20 points each for up to three projects, so the total number of points available for OPA is 60. OR

To be considered separate projects, each outreach project must either use different media or must involve two-way communication with a different audience. For example, presentations to the Chamber of Commerce, a neighborhood association, and a meeting of insurance agents are considered three separate projects (e.g., OPA1, OPA2, and OPA3). However, handing out the same brochure to the three groups and displaying the brochure in city hall and the library are all considered one project. If the information in the brochure was also the subject of a cable TV notice, it would be considered a second project.

Example 331.c-1. A flyer advertising a "floodproofing open house" is posted in various public places in Watertown and publicized through news releases. The open house includes presentations on flood protection and flood insurance along with exhibits set up by local flood-proofing contractors.

Staff members from government agencies, including Watertown's building department, the State NFIP Coordinator, FEMA, the National Flood Insurance Program, and the U.S. Army Corps of Engineers participate and answer technical questions. Also present were volunteers from local conservation organizations who passed out materials and answered questions about Watertown's parks and bottomland hardwoods.

The floodproofing open house was designed to encourage people to undertake flood protection measures. People from many communities are invited, so the program does not discuss any particular river's flood problem or have local flood maps. Instead, attendees are advised to check with their city engineers' offices for flood data. The program does not cover flood warning, flood safety, or drainage system maintenance.

Watertown has a complete description of the project and can document that five of the 10 topics are covered: flood insurance, property protection, development permit requirements, substantial improvement requirements, and the natural and beneficial functions of the local floodplain.

OPA1 = 2 x 5 = 10

Watertown's City Hall lobby has a rack of handouts, brochures, and other informative materials of interest to citizens. The rack includes a supply of the CRS brochures (which

cover flood insurance) and a handout from the Building Department on why and when floodplain permits are needed (permit requirements).

OPA2 = 2 x 2 = 4

If Watertown had another outreach project, it would be designated OPA3.

2. Outreach projects pursuant to a public information program strategy (OPS) (Maximum credit: 125 points). This is an alternative to Section 331.c.1. (OPA).

OPS = the total of the following points:

(a) 100 for implementing additional outreach projects that are identified in a public information program strategy, regardless of the number of projects or topics covered. The strategy must reflect a logical thought process that reviews the problem, lists what public information activities are currently being implemented, sets goals, and recommends any new projects that may be needed to reach those goals. This credit is dependent on a public information program strategy prepared according to the following criteria:

(1) The community must establish a public information outreach strategy team that includes representatives of agencies and organizations active in floodplain management and public information. The strategy team need not be a formal organization. At a minimum it must consist of three people, including:

((a)) Someone familiar with the community's floodplain management program, and

((b)) At least one representative from outside the community's government.

(2) The outreach strategy team must prepare a written document that describes:

((a)) The local flood hazard,

((b)) The flood safety and property protection measures appropriate for that hazard,

((c)) The flood-related public information activities currently being implemented within the community (including those by non-government agencies),

((d)) Goals for the community's public information program,

((e)) The outreach projects that will be done each year to reach the goals, and

((f)) The process that will be followed to monitor and evaluate the projects.

(3) The projects must be in addition to any projects credited under Section 331.a or 331.b. They do not have to cover the same 10 topics, but discussion of each topic must describe where to get more information.

(4) The community must submit documentation that the strategy is being implemented by the community.

(5) The community's annual recertification must include a copy of an annual report evaluating the projects implemented.

(b) 25, if the strategy meets the above credit criteria and the following additional criteria are met:

(1) The community's public information program strategy was prepared or updated by a strategy team that includes several community stakeholders, such as representatives from the public, private businesses and major employers.

(2) The strategy is a multi-hazard one. The document must include a description of all the natural hazards that pose a major threat to the community and the safety and property protection measures appropriate to those hazards. As with the regular credit for this element, if these descriptions are in other documents, they may be attached to the strategy.

(3) The planned outreach projects address the other hazards, in addition to the flood hazard.

A community that prepares, implements, and monitors its public information strategy would receive up to 125 points, regardless of the number of projects or topics covered. It is assumed that a properly prepared strategy that reviews the problem, determines how to best reach the target audiences, and coordinates with other information programs will produce the best outreach projects for that community.

Therefore, the organization of the outreach strategy team and the preparation of the strategy document are most important. Some guidelines on the five parts of the criteria are presented below. Additional information, guidance, and examples are found in *CRS Credit for Outreach Projects* (see Appendix E).

(a) The public information outreach strategy team does not have to be a formal organization. It can be as small as three people or it can be a larger group that wants to coordinate the public information activities in a metropolitan area. Several communities can cooperate or the strategy may be prepared at the county level. In such cases, the community would have to have at least one representative on the strategy team.

The outreach strategy team must have at least three members, including:

(1) Someone familiar with the community's floodplain management program, such as the CRS Coordinator, and

(2) At least one representative from outside the community's government. This could be someone from the public schools, a neighborhood association, the Red Cross, insurance agencies, utilities, or other offices involved in education or floodplain management.

Additional members could include someone familiar with the local emergency management program, floodplain residents, or someone from the public information office.

It should be noted that the CRS does not intend that this create an unwarranted burden on communities. This team can be very informal and need only meet once or twice a year. Existing committees or advisory boards may fulfill the role if they include at least the representation noted above to ensure coordination with groups outside the city or county government.

The membership of the team will vary by community. A coastal town dependent on tourism should have a motel or restaurant owner involved because explaining flood warning and evacuation procedures to tourists would be important. A community with one or two major employers may want to include the people responsible for employee newsletters.

The emergency management representative could be from the county office. Communities, especially smaller ones, are encouraged to work together or with their counties to develop area wide programs.

The strategy may be prepared concurrently with the floodplain management plan credited under Activity 510 and the planning committee for each may be the same. The strategy document may be part of a floodplain management plan or it may be a separate paper.

(b) The strategy document need not be long. Some of the information, such as the local flood hazard and the flood safety and property protection measures appropriate for that hazard, may already be written in an existing outreach project or floodplain management or emergency management plan.

The section on the flood-related public information activities currently being implemented within the community should include an inventory of what is done by the local government, the county emergency management agency, the schools, the state, and others concerned about

flooding, such as a sanitary district or insurance agents. The objective of this requirement is to identify who is already informing the public. The strategy should capitalize on what is being done, coordinate messages, and develop new projects that fill gaps left by the existing programs.

Example goals for a public information program strategy include, but are not limited to:

- publicize flood safety measures,
- get people to evacuate when a warning is issued,
- advise people on how to protect their property from flood damage, and/or
- encourage the purchase of flood insurance.

Each community should set its own, locally appropriate goals. If people have been killed in past floods, safety measures may be paramount. On a hurricane-prone coast, evacuation may be the most important goal. In areas of local drainage and sewer backup problems, publicizing self-help protection measures may be the top goal.

The strategy must establish a monitoring and evaluation process that reviews each year's projects and makes appropriate changes for the next year. Where possible, each project should have measurable outcomes, such as number of inquiries for more information, number of retrofitting building permits, or number of flood insurance policies in force.

It is likely that more expensive projects in metropolitan areas would have more specific objectives and more sophisticated evaluation procedures. A progress report must be submitted with each year's CRS recertification.

(c) The number and type of projects to be undertaken each year would be up to the community based on its goals and the principles of good public information programs. If the community receives credit under 331.a and b (OPC and OPF) of this activity, it must do additional projects to receive this OPS credit.

The projects do not have to be implemented by the community government. They can be targeted to the general public or to selected audiences, such as insurance agents and contractors, to help them implement their own outreach projects that work toward the program's goals.

The projects do not have to be the same every year. For example, the strategy may work with the schools to develop a flood safety curriculum the first year and then focus on workshops for insurance agents in later years.

The discussion of each topic must describe where to get more information. Examples of sources of more information could be local staff, the library, another agency, or a CRS credited activity, such as Activity 360 (Flood Protection Assistance).

Example 331.c-2. Floodville's mayor appointed a public information strategy team with participation by the CRS Coordinator, the public relations director, and the emergency manager. The school district, the park district, the power company and the associations for insurance agents, lenders and real estate offices were invited to send someone.

The strategy set three goals:

- Make residents aware of the flood warnings and safety precautions,
- Make residents more aware of flood insurance, and
- Familiarize residents with appropriate property protection measures

The strategy team selected the following projects:

- Notices sent out with utility company bills about turning off the electricity and gas if the house is threatened with flooding,
- An NFIP-sponsored workshop for insurance agents,
- A spring flood awareness week with a radio talk show on flood warnings and safety and displays on flood protection measures set up in home improvement stores,
- A meeting to be held with the school district curriculum committee to develop flood awareness and safety classes for elementary school students,
- A meeting between the building department and the local homebuilders association on floodplain permit requirements and property protection methods,
- The flood protection flyer credited as an OPC, to be sent out just before the flood awareness week, and
- Recommended revisions to the flood control district brochure credited as an OPF to include property protection.

OPS = 100

(d) The community must submit documentation that the strategy is being implemented by the community. This can be something as simple as a letter from the CEO that it will be followed. It does not require formal adoption by a city council, although it is recommended that elected officials be involved in the preparation or approval of the strategy.

If a joint strategy is prepared by several communities or at the county level, the community must also adopt it locally in order to receive this credit.

(e) The strategy team must meet at least once a year to evaluate what was done and what, if anything, should be changed. The strategy document must specify when and how this is done. A written report must be included in the CRS recertification that is due October 1 of each year. The evaluation report must cover the following points:

- The goals of the community's Public Information Program Strategy
- A list of the projects implemented to meet those goals and their objectives
- A list of those projects that were not implemented or that did not reach their objectives
- Revisions to the current projects and new projects to be implemented during the coming year, if different from the original strategy.

Communities may use AW-330-3 in lieu of a formal written report (see Figure 330-2).

332 Credit Calculation

a. c330 = OPC + OPF + OPA, OR

b. c330 = OPC + OPF + OPS

Example 332-1. Floodville's scores are based on the three examples discussed above.

c330 = OPC + OPF + OPS = 40+ 69 + 100 += 209

Floodville's credit is shown in Figures 330-2a and 330-2b.

333 Credit Documentation

The community must submit the following:

a. Copies of the notices, articles, flyers, and other materials used in the outreach projects. Each item must be marked with its appropriate acronym (OPC, OPF, OPA, or OPS) and the topics covered must be designated in the margins.

See Figure 330-1 for an example of how to mark the projects. The flood awareness week could be documented with a newspaper article, photographs, or similar record that shows when it was held. Meetings can be documented with a copy of the minutes or a memo to the file.

b. [If the community applies for credit under Section 331.c.2] A copy of the public information program strategy document and documentation that it is being implemented by the community.

c. Documentation that shows when the outreach projects are undertaken.

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

d. Copies of the community's outreach projects that were conducted that year.

e. [If the community applies for credit under 331.c.2] A copy of the annual evaluation of the community's public information program strategy, either as a separate report or on AW-330-3. If a separate report is submitted, it must cover the same topics as AW-330-3.

334 For More Information

a. See Appendix E to order a free copy of *CRS Credit for Outreach Projects*.

b. Some state and local emergency management offices have training courses for public information officers. FEMA's Emergency Management Institute (EMI) offers basic and advanced public information courses. EMI courses are tuition free and travel stipends can often be obtained. For more information, contact your state emergency management agency's training officer.

c. Flyers and stuffers on flood insurance are available through the National Flood Insurance Program. Contact a local insurance agent who sells flood insurance for examples and order forms, or obtain them from

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

d. There are several brochures that explain the CRS. Bulk supplies are available by calling (317) 848-2898 or by sending an e-mail request to nfipcrs@iso.com.

e. The following are available free from FEMA Publications by calling 1-800-480-3520.

Hurricane Awareness Workbook, FEMA-86, includes references to organizations with experience in conducting hurricane awareness campaigns and examples of local projects.

Marketing Earthquake Preparedness, FEMA-112, provides guidance on developing a local hazards preparedness campaign.

Homeowner Floodproofing Behavior is a summary of research findings on post-flood public information activities that encouraged people to protect themselves from the next flood.

Answers to Questions about Substantially Damaged Buildings, FEMA-213, explains the requirements of and offers guidelines on the NFIP's substantial damage rules.

e. For more references on the 10 topics, see Section 354. Also see Figure 530-3 for a discussion of property protection.

f. Open houses are public meetings that combine presentations, publications, and discussions with government officials, experienced flood protection contractors, flood insurance agents, etc.. *How to Conduct a Floodproofing Open House* provides step-by-step instructions on this form of outreach project. It is available for $7.00 from the Illinois Association for Floodplain and Stormwater Management, 153 Nanti, Park Forest, IL 60466.

OMB No. 3067-0195
Expires February 28, 2005

Community: Floodville

333.e Public Information Program Strategy Evaluation

1. Goals of the community's Public Information Program Strategy:

   1) Make residents aware of the flood warnings and safety precautions
   2) Make residents aware of flood insurance, and
   3) Familiarize residents with appropriate property protection measures

2. Projects implemented to meet those goals and their objectives:

   a. Utility bill notices on flood safety
   c. Spring flood awareness week radio talk show on flood warning and safety and displays on protection measures in home improvement stores
   d. Revised flood control district OPF brochure
   e. Working with the school district curriculum committee to develop flood awareness and safety classes
   f. Working with the Homebuilders Association on permit requirements and property protection measures
   g. OPC flood protection flyer

3. Were any projects not implemented or objectives not reached? If not, why?

   b. We intended to have an NFIP workshop for insurance agents. It was scheduled for April 25, but we couldn't get enough insurance agents to sign up for the workshop, so it was cancelled.
   d. The flood control district had already printed two years' worth of brochures and would not revise it until they are out of stock. The old ones were distributed instead.

4. What new projects should be implemented and what projects or objectives should be revised?

   b. Meet with several insurance companies to determine the best way to get them more informed about and interested in flood insurance.
   d. Help school district develop materials for new 3rd grade curriculum on fire and weather safety.
   e. Hold workshop for the Homebuilders with state and FEMA help

For more information, contact: Jane Doe Phone: 101/555-1234

Activity Worksheet AW-330-3 Edition: 2002

Figure 330-2. Floodville's evaluation report for its outreach project (AW-330-3).

340 HAZARD DISCLOSURE

Summary of Activity 340

341 Credit Points. There are four elements in this activity for a maximum of 81 points.

a. Disclosure of the flood hazard (DFH):

- 46 points are provided if real estate agents notify those interested in purchasing properties located in the Special Flood Hazard Area (SFHA) about the flood hazard and the flood insurance purchase requirement.
- 20 points are provided if there is a state law requiring real estate agents to ensure that potential purchasers of properties in the SFHA are notified of the flood hazard.

b. Other disclosure requirements (ODR): 5 points are provided for each other disclosure method required by law.

c. Real estate agents' brochure (REB): 10 points are provided if real estate agents are providing brochures or handouts that advise potential buyers to investigate the flood hazard for a property.

d. Disclosure of other hazards (DOH): 10 points are provided if the notification to prospective buyers includes disclosure of other flood-related hazards, such as erosion, subsidence, or wetlands.

There is no impact adjustment for this activity.

342 Credit Calculation. The credit points for each element are totalled.

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

a. [If applying for DFH credit under Section 341.a.1] Copies of completed disclosure notices from at least five local real estate agencies showing that they are advising potential property purchasers of the flood hazard and the flood insurance purchase requirement.

b. [If applying for DFH credit under Section 341.a.2] A copy of the state law that requires real estate agents to ensure that those interested in purchasing properties located in floodplains are notified of the hazards.

c. [If applying for ODR credit under Section 341.b] A copy of the portion of the ordinance or law that requires one or more additional disclosure methods at the time of sale or rental of a property.

d. [If applying for REB credit under Section 341.c] The brochure or other document made available by real estate agents.

e. [If applying for DOH credit under Section 341.d] Documentation that the notice for DFH includes disclosure of other flood-related hazards.

344 For More Information.

340 HAZARD DISCLOSURE

Credit is provided if real estate agents advise prospective property purchasers of the flood hazard. Other disclosure methods may also be credited.

Background: Most prospective buyers do not take the time (or know how) to investigate whether a property is subject to a hazard. In many cases a property may not be near a stream or shoreline, past flooding may have been minor, or there may be no history of flooding since the area was developed. As a result, many people are caught by surprise when their properties are flooded. One of the best times to advise someone of a flood hazard is at the time they are considering the purchase of property.

Current federal law requires only that a lender advise a person of the flood hazard 10 days before closing on the loan. This could be well after the buyer has put down earnest money, has lost interest in other properties, and has become committed to purchasing a property without knowing all the facts. In many states a buyer has recourse under consumer protection laws.

Activity Description: Credit is provided if a community's real estate agents advise prospective floodplain occupants about the flood hazard and the flood insurance purchase requirement. This activity should encourage the purchase of flood insurance and implementation of flood protection measures, prevent victimization of unwary buyers, and encourage appropriate use of vacant land.

The objective of this activity is to prevent all the troubles that can arise from failing to advise potential purchasers of a flood hazard. Such a program can protect the real estate agents and sellers from lawsuits. In many cases, it will prevent unwise development of vacant land.

341 Credit Points

Maximum credit for Activity 340: 81 points.

a. Disclosure of the flood hazard (DFH) (Maximum credit: 46 points)

DFH = EITHER

1. 46, if real estate agents notify those interested in purchasing properties located in the Special Flood Hazard Area (SFHA) about the flood hazard and the flood insurance purchase requirement. The notice must clearly state whether the property is in the floodplain and, if so, that flood insurance is required. The community must submit examples of the disclosure notices used by local real estate agencies. OR

2. 20, if a state law requires real estate agents to advise people whether a property is located in a Special Flood Hazard Area.

Credit for disclosure of the flood hazard (DFH) relies on real estate agents to inform a potential purchaser whether a property is in an SFHA. Under the first option (46 points), there is no requirement for a statutory or other legal mandate that real estate agents disclose the hazard in order to obtain credit for DFH. This credit is based on the documentation that real estate agents are disclosing the hazard, not on why they are doing it.

This activity can be implemented in conjunction with Activity 320 (Map Information). Real estate agents may request that the community make determinations of properties being advertised for sale. However, no credit is provided if prospective buyers are sent to the community to find out about a property's potential flood risk. Credit for DFH is entirely based on the real estate agents' informing people whether a property is in an SFHA, regardless of whether they were asked. A law or policy to disclose hazard information only after an inquiry is made does not earn credit.

Credit for DFH cannot be based on real estate agents' using a seller's statement or certificate. Even though the sellers have not experienced a flood while they owned the property, the information that is required is notification of whether the property is in an SFHA.

The best way to implement this activity is with a written notification to potential purchasers. This provides the purchaser with the correct information and provides documentation for the real estate agent and the ISO/CRS Specialist.

The community's application must include at least one copy of a disclosure notice from at least five real estate agencies that serve the community. If there are fewer than five agencies, then at least one notice from each agency must be submitted. The community should check with its ISO/CRS Specialist to see if neighboring communities are receiving this credit and have already submitted the needed documentation for real estate agencies that serve the area.

If the notice says a property is in the SFHA, it must also tell the inquirer that federal law requires the purchase of flood insurance as a condition of a federally backed mortgage. The notice may simply say, "Flood Insurance Required," in which case the notation that the property is in the SFHA is not needed. A property notice that is difficult for the prospective buyer to interpret, such as "FP: Y/N," or a general statement on all properties, such as "Flood insurance may be required," or "Flood Zone," is not acceptable. The form must clearly state, "Flood insurance is required."

The credit criteria for the second option for DFH credit (20 points) are not as extensive as for the first option, provided there is a state law requiring the disclosure. Credit can be provided if there is a Multiple Listing Service notice, a seller's disclosure form, or other written notification. However, the disclosure must state whether the property is in a floodplain, not whether the seller has experienced a flood. For this 20-point credit, there is no requirement to explain the flood insurance purchase requirement.

Example 341.a-1. The real estate agents of Floodville include a notice of flood hazard and whether flood insurance is required on their property summaries. When a seller contracts with a real estate agent, the latter requests map information from the City. The cost is paid by the real estate agent. The Board of Realtors® has provided the City with a description of this procedure and a copy of a property summary that includes the notice. [DFH = 46]

NOTE: *Credit points are provided under ODR, method 2, for a legal requirement to advise potential purchasers about the property's known flood history. Credit is also available under Section 341.c if real estate agents provide a brochure that advises potential property purchasers to investigate the flood hazard.*

b. Other disclosure requirements (ODR) (Maximum credit: 15 points)

ODR = 5, for each other disclosure method required by law. If two other methods are required, ODR = 10. Credit can only be applied for up to three other disclosure methods, including but not limited to:

1. Requiring all sellers to disclose in order to cover those cases where a real estate agent is not involved.
2. Requiring real estate agents and sellers to advise potential purchasers whether "to the best of their knowledge and belief" the property has ever been flooded.
3. Requiring landlords to advise potential renters about the flood hazard.
4. Requiring final recorded subdivision plats to display the flood hazard area.
5. Requiring individual lot surveys to show the flood hazard area.
6. Requiring titles or deed records to show zoning or building permit conditions related to floodplain or drainage regulations, such as a notice about the substantial improvement or substantial damage requirement for floodplain properties.
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 erosion, subsidence, or wetlands. This credit is only available if the community also receives credit for DFH

342 Credit Calculation

c340 = DFH + ODR + REB + DOH

Example 342-1. Floodville does not have maps or disclosure practices on other flood-related hazards (DOH = 0).

c340 = 46 + 10 + 10 + 0 = 66

Floodville's activity worksheet is completed using these values for the variables.

Flood Hazard: Check Before You Buy

Flooding and other surface drainage problems can occur well away from a river, lake, or ocean. If you're looking at a property, it's a good idea to check out the possible flood hazard before you buy. Here's why:

- The force of moving water or waves can destroy a building.
- Slow-moving floodwaters can knock people off their feet or float a car.
- Even standing water can float a building, collapse basement walls, or buckle a concrete floor.
- Water-soaked contents, such as carpeting, clothing, upholstered furniture, and mattresses, may have to be thrown away after a flood.
- Some items, such as photographs and heirlooms, may never be restored to their original condition.
- Floodwaters are not clean: floods carry mud, farm chemicals, road oil, and other noxious substances that cause health hazards.
- The impact of a flood—cleaning up, making repairs, and the personal losses—can cause great stress to you, your family, and your finances.

Floodplain Regulations: Your community regulates construction and development in the floodplain to ensure that buildings will be protected from flood damage. Filling and similar projects are prohibited in certain areas. Houses substantially damaged by fire, flood, or any other cause must be elevated to or above the flood level when they are repaired.

Check for the Flood Hazard: Before you commit yourself to buying property, do the following:

- Ask the local building, zoning, or engineering department if the property is in a floodplain; if it has ever been flooded; what the flood depth, velocity, and warning time are; if it is subject to any other hazards; and what building or zoning regulations are in effect.
- Ask the real estate agent if the property is in a floodplain, if it has ever been flooded, and if it is subject to any other hazards, such as sewer backup or subsidence.
- Ask the seller and the neighbors if the property is in a floodplain, how long they have lived there, if the property has ever been flooded, and if it is subject to any other hazards.

Flood Protection: A building can be protected from most flood hazards, sometimes at a relatively low cost. New buildings and additions can be elevated above flood levels. Existing buildings can be protected from shallow floodwaters by regrading, berms, or floodwalls. There are other retrofitting techniques that can protect a building from surface or subsurface water.

Flood Insurance: Homeowners insurance usually does not include coverage for a flood. One of the best protection measures for a building with a flood problem is National Flood Insurance, which is purchased through any property insurance agent. If the building is located in a floodplain, flood insurance will be required by most mortgage lenders (see other side). Ask an insurance agent how much a flood insurance policy would cost.

*[**NOTE:** The other side of this flyer is the same as Figure 320-2.]*

Figure 340-1. Sample real estate agents' brochure.

343 Credit Documentation

The community must submit the following:

a. [If the community is applying for DFH credit] Documentation that demonstrates that real estate agents are advising potential property purchasers of the flood hazard and the flood insurance purchase requirement.

If the community is applying for DFH credit for the first option (46 points), the application must include copies of disclosure notices from at least five real estate agencies. If there are fewer than five agencies that serve the community, then at least one notice from each agency is submitted.

This documentation could be copies of the notations on property summary sheets, offer-to-purchase forms, Multiple Listing Service (MLS) forms or other media. Seller's disclosure forms may be sufficient if they clearly state that the property is or is not in the SFHA. Statements that "to the best of the seller's knowledge" and statements as to whether the property has flooded are not creditable. However, such forms may be eligible for credit under 341.b, ODR. Statements that advise the seller to determine if the property is floodprone are not creditable, although such forms may be eligible for credit under Section 341.c, REB.

Blank forms are not acceptable documentation. Copies of actual information shown to prospective buyers are required. Names and addresses may be blacked out to preserve confidentiality.

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 341.a includes disclosure of other flood-related hazards, such as 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. 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

a. Copies of the following booklet are available free from

Tennessee Valley Authority
Floodplain Management Operations
415 Walnut Street
Liberty Building, Room 2N 200A
Knoxville, TN 37902

Flood-Prone Property: A Guide for the Real Estate Professional, TVA/ONRED/AWR-87/35, Tennessee Valley Authority, September 1987.

b. 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.

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350 FLOOD PROTECTION INFORMATION

Summary of Activity 350

351 Credit Points. There are three elements in this activity for a maximum of 66 points.

a. Flood protection library (LIB): 25 points are provided if the local public library contains at least one document from these topics and the documents are entered into the library's card catalog or similar system that allows patrons to find publications related to flooding and flood protection.

b. Locally pertinent documents (LPD): Up to 5 points are provided for having documents keyed to local or state conditions.

c. Flood protection website (WEB): Up to 36 points are provided for including flood protection information or links to such information on the community's website.

There is no impact adjustment for this activity.

352 Credit Calculation. The credit points for each element are totaled.

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

a. [Required only if the community is applying for LIB or LPD credit] A statement from the head of the library that includes:

1. A list, with publication dates, of the flood-related documents in the library;
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. Certification that the library will maintain adequate numbers of the listed documents to meet the demand and that the FIRMs and other materials will be kept up to date.

b. [Required only if the community is applying for WEB credit] The address of the community's website.

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

c. [Required only if the community is applying for WEB credit] Certification that it has conducted its annual review and update of the information and links on its flood protection website.

354 For More Information.

350 FLOOD PROTECTION INFORMATION

Credit is provided if the local library maintains documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains. Additional credit is provided if similar information is available on the community's website.

Background: The community library is an obvious place for residents to seek information on flooding and flood protection. A website is another place that people often look. Both locations can contain a great deal of information and both offer alternatives for people who are hesitant to go to City Hall or talk to a local official.

Activity Description: To receive credit under the first element, the publications must be kept and distributed by the public library. The publications do not need to be kept in each library building if there are several branches to a local library system. No credit is provided for documents kept in an office that is not a local public library.

To receive credit for the website, the information must be clearly identified on the site's home page. It must be in or accessible from the community's website.

In both cases, the material must be kept up to date.

The objective of this activity is to ensure that there is a sufficient number of references on floodplain management and flood insurance available for interested parties. Rather than stipulate what a "sufficient number" is, this activity specifies that the documents be kept by a public library or on a local website. It is up to the library to maintain an adequate number to meet the demand.

Libraries can also provide immediate access to additional references through interlibrary loan systems. Websites can provide direct links to additional information.

A secondary objective of this activity is to involve the public library in the community's flood concerns. Libraries are usually the first place people turn to when they want to research a topic. Lately, more and more people are turning to the Internet. Libraries also have their own public information campaigns with displays, lectures, and other projects, which can augment the activities of the municipal or county government.

351 Credit Points

Maximum credit for Activity 350: 66 points.

a. Flood protection library (LIB) (Maximum credit: 25 points)

LIB = the total of the following points based on whether the library contains documents from these topics and the documents are entered into the library's card catalog or similar system that allows patrons to find publications related to flooding and flood protection:

1. 4, for a copy of the community's current Flood Insurance Rate Map (FIRM) and the Flood Boundary and Floodway Map and an explanation of their use;
2. 2, for documents on flood insurance;
3. 8, for documents on protecting a building;
4. 3, for documents on community floodplain management or flood hazard mitigation;
5. 3, for documents on the natural and beneficial functions of floodplains;
6. 3, for an up-to-date directory of addresses and telephone numbers of local offices that can provide more information on the above topics; and
7. 2, for documents on the special hazards that affect the community.

For the purposes of Community Rating System (CRS) credit, "the library" means the public library most accessible and most widely used by residents of the community. In a community with branch libraries, the publications and other documents must be available to all branches, although it is not necessary for each branch to maintain a full set. If a small community does not have a library, but an adjacent large community does, the small community may receive credit for this activity, because its residents will presumably use the library in the adjacent community.

Although only one document for each topic is required, it is expected that the library will have more than one title on each topic, especially on protecting a building. It is assumed that the library will order additional copies and additional titles in accordance with the demand.

The documents must be entered into the library's card catalog or similar system that allows patrons to find publications related to flooding and flood protection. Some libraries place these documents in a reference library that contains uncataloged items. In such cases, the card catalog still needs an entry under "flood," which could read, "See Reference Librarian for materials on flooding and flood protection."

The directory of addresses and telephone numbers must be of local or nearby offices that are willing to provide more information. These could include the local building department or engineer, the State National Flood Insurance Program (NFIP) Coordinator, the U.S. Army Corps of Engineers' District Flood Plain Management Services Office, or private conservation and environmental groups. Credit is not provided if only state and national offices are listed.

Two points are provided for documents on the special hazards that affect the community. Special hazards are discussed in Section 401. They include flood-related hazards, such as closed basin lakes, mudflows, and coastal erosion. There are separate publications on CRS credit for these hazards (see Appendix E) that would suffice for this credit. Those publications list additional references that would also be useful for the libraries of communities subject to the hazards.

Example 351.a-1. The head of Floodville's library has obtained and cataloged one copy of the FIRM, Flood Boundary and Floodway Map, the Federal Emergency Management Agency's (FEMA's) booklet on FIRMs (FEMA-258), and several documents on flood insurance, protecting a building from flooding, and community flood hazard mitigation. A local organization, The Friends of Foster Creek, provided a study on the bottomland hardwoods of the Foster Creek floodplain. A directory of sources of additional information was not prepared, nor is there a mention of the ice jams that affect Floodville. The activity worksheet reflects this:

LIB = 4 + 2 + 8 + 3 + 3 + 0 + 0 = 20.

The librarian has listed all the documents obtained along with some already in the library. The list is attached to a letter certifying that the library "has entered all of the documents into the library's card catalog" and it "will maintain adequate numbers of the listed documents to meet the demand."

b. Locally pertinent documents (LPD) (Maximum credit: 5 points)

LPD = 1, for each document that is keyed to local conditions or conditions in the state. The maximum value for LPD is 5.

Section 331 discusses the benefits of locally pertinent documents. Many communities have published their own guidebooks for their residents, particularly on how to protect a building from flood damage. Many State NFIP Coordinators have prepared manuals or booklets on flood insurance and how to read flood insurance maps. Other locally pertinent documents include the community's flood insurance study text, flood control or hazard mitigation plans, after-action reports evaluating responses to past floods, and regional flood control or floodplain management plans.

Example 351.b-1. One of the Floodville Library's books is the regional planning commission's report on flooding and floodplain management recommendations. The library also includes the state's book on protecting a home from flooding and the report on the Foster Creek bottomland hardwoods:

LPD = 3.

c. Flood protection website (WEB) (Maximum credit: 36 points)

1. Prerequisites. The website must meet the following criteria:

(a) The site must be easy to locate by its internet address, universal resource locator (URL), or a search feature. If searching for the community's name will not get the user to the community's website, then the address must be publicized through an outreach project that reaches at least 90% of the community.

(b) The link to the flood protection information must be clearly noted on the home page of the community's website.

(c) Information may be provided via links to other websites, provided they are pertinent to the community's flood conditions.

(d) The site must include a link to the Federal Emergency Management Agency's website (www.FEMA.gov).

(e) The site must be reviewed and updated at least once each year.

These prerequisites assure that people have ready access to the latest information. The first prerequisite ensures that an internet user can find the community's website. Normally this is done by entering the community's name in the address line or in a search engine. If that will not work (e.g., when the site is administered by a university, county, or flood control district), then the community must publicize the site's address.

That publicity must be carried out through an outreach project that reaches at least 90% of the community. The publicity may be a part of an Outreach Project to the Community (OPC), credited under Activity 330. It does not have to be submitted for OPC credit. For example the site's address could be publicized in utility bills that reach all utility customers ("For flood protection information, see the Metropolitan Sewer District's website at www.FloodHelp.org"). In this case, there is not enough information to qualify for OPC credit, but the publicity prerequisite would be met.

The site's home page must include a connection to the flood protection information. Examples of home page listings are "flood protection," "hurricane protection," "flood information," "stormwater," "floods and other hazards," etc. A list of department names will not qualify, but a search feature on the home page that links "flood" or a similar term to the information would qualify.

The flood protection website may include links to other sites operated by the state; the regional flood, water resources, or sewer district; universities; and others with information related to the credited topics. However, the other sites must have information pertinent to the community's flood conditions (e.g., a riverine community should not refer users to a coastal website). The mandatory connection to FEMA's website ensures that the latest information on the National Flood Insurance Program and other FEMA programs will be provided.

NOTE: *If the community's website does not meet these prerequisites, it may still qualify for credit as an additional outreach project under Section 331.c in Activity 330 (Outreach Projects). Credit is not provided under both of these activities, however.*

2. Credit points. WEB = the total of the following points.

   (a) The following Items must be covered to at least the same level of detail as described in Section 331 (Outreach Projects Credit Points). Some topics are worth four points and some are worth two points:

Four points	Two points
The local flood hazard	Flood safety
Map of the local flood hazard	Flood warning system
Floodplain development permit requirements	Flood insurance
Property protection measures	Drainage system maintenance
Substantial improvement/damage requirements	Natural/beneficial functions

   (b) 2, for publicizing the fact that copies of elevation certificates can be obtained from the appropriate community office.

   (c) 4, for providing real time river gage data for sites that affect the community. If a local gage stage datum is used, the gage data must relate to mean sea level, NGVD, or a local landmark. (e.g., "two feet over the Route 30 bridge"). This credit is dependent on the website's covering the flood safety topic.

The first 10 items are the same topics that are credited under Activity 330 (Outreach Projects). At the beginning of that activity is a discussion of what should be included to receive full credit for covering each topic. The weights given to each topic here differ from those in Activity 330. Those

topics that can be covered in more detail or with more illustrations on a website are provided more credit here.

The website must fully cover a topic at the same level of detail as required for Activity 330 (Outreach Projects). Examples are included in Figure 330-1. More information can be provided by having a link to another site (e.g., "For more information on flood insurance, see www.fema.gov/nfip/infocon"). If the topic must be "local" or "relevant," the linked website must address local conditions.

Example 351.c-1. On the home page of Floodville's website is an entry called "Flood Protection." This links to a page that notes that the City has a flood problem but that many things are being done about it. It stresses that residents can do things to protect themselves. The following links are provided:

- "Our flood hazard," a description of the flood hazard (4 points) taken from the outreach projects the City prepared for Activity 330. This page includes some color photos of recent floods in the City.
- "Flood safety tips" (2 points), also taken from the outreach projects.
- "Permit requirements," a summary of the City's floodplain development permit requirements (4 points) with links to the Building Department's page, which has permit application forms and other information on getting permits.
- "Drainage maintenance" covers the benefits of drainage system maintenance and City regulations related to drainage (2 points).
- "Protecting your home," a summary of relevant property protection measures with links to FEMA's *Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding*, *Above the Flood: Elevating Your Floodprone House,* and *Repairing Your Flooded Home* (4 points).
- "Flood insurance" is a link to FEMA's web page that explains the basics of flood insurance (2 points).
- A note that copies of elevation certificates can be obtained from the Building Department (2 points).

WEB = 4 + 2 + 4 + 2 + 4 + 2 + 2 = 20

352 Credit Calculation

c350 = LIB + LPD + WEB

Example 352-1. As noted above, LIB = 20, LPD = 3, and WEB = 20.

c350 = 20 + 3 + 20 = 43

353 Credit Documentation

The community must submit the following:

a. [Required only if the community is applying for LIB or LPD credit] A statement from the head of the library that includes the following items:

1. A list of the documents available in the library, with their publication dates.

2. Either:

(a). A certification that the documents listed have been entered into the library's card catalog or similar system that allows patrons to find publications related to flooding and flood protection, or

(b). A copy of the card catalog cards or printout of the automated system's inventory of documents listed under "flood" or related topics.

3. A certification that the library will maintain adequate numbers of the listed documents to meet the demand and that the FIRM and other materials will be kept up to date.

A letter signed by the appropriate official responsible for administration of the library or library system is sufficient. If the community's library is a system with multiple libraries, the CRS Coordinator should include a brief description of the system. If the community has no library and is applying for credit for a library in an adjacent town or a county library system, this documentation must be obtained from the librarian responsible for the system.

A list of documents meeting the intent of this activity is found in Section 354.

b. [Required only if the community is applying for WEB credit] The address of the community's website.

The community's website credit (WEB) is verified by a review of the website itself. Credit will be denied if the prerequisites are not met or if the topics are not adequately covered.

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

c. [Required only if the community is applying for WEB credit] Certification that it has conducted its annual review and update of the information and links in its flood protection website.

354 For More Information

a. Unless otherwise noted, the following documents are available free. See the FEMA Order Form at the end of Appendix E.

1. A copy of the FIRM and Flood Boundary and Floodway Map and an explanation of their use:

   The community's CRS Coordinator should provide the library with a copy of the FIRM and Flood Boundary and Floodway Map. Additional copies can be ordered by calling 1-800-358-9616 or faxing a request to 1-800-358-9620. The toll-free map distribution center is staffed from 8:00 a.m. to 8:00 p.m., EST, Monday through Friday. Maps are provided to local government officials at no charge.

   An explanation of the use of flood insurance maps can be found in *How to Use a Flood Map to Protect Your Property*, FEMA-258, May 1995.

2. Documents and websites on flood insurance:

   Although flyers, stuffers, and similar brief reviews of flood insurance are appropriate for an outreach project, they are not adequate for credit under Activity 350 (Flood Protection Information).

   Answers to Questions about the National Flood Insurance Program, FEMA 387, Federal Emergency Management Agency, August 2001. http://www.fema.gov/nfip/qanda.htm

   Flood Insurance Frequently Asked Questions and the NFIP Answer Desk are at http://www.fema.gov/nfip/answer.htm.

   Mandatory Purchase of Flood Insurance Guidelines, FEMA-186, Federal Emergency Management Agency, 1999. http://www.fema.gov/nfip/mpurfi.htm.

Repairing Your Flooded Home, FEMA-234, 1992. This handbook is like several other books that cover flood insurance as part of giving a property owner information on all methods of flood protection. These types of documents can be credited provided that there is sufficient coverage of insurance and that they are appropriately cataloged so they can be found by someone interested in flood insurance.
http://www.fema.gov/library/repfhm.pdf

There are several brochures that explain the CRS. Bulk supplies are available by calling (317) 848-2898 or emailing nfipcrs@iso.com.

3. Documents on protecting a building:

Above the Flood: Elevating Your Floodprone House, FEMA-347, 2000.
http://www.fema.gov/libarar/fema347.htm

Avoiding Flood Damage: A Checklist for Homeowners
http://www.fema.gov/libarary/flddam.pdf.

Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding. FEMA-312, 1998.
http://www.fema.gov/mit/rfit/

Repairing Your Flooded Home, FEMA-234, 1992.

Elevated Residential Structures, FEMA-54, March 1984.

Coastal Construction Manual, FEMA-55, Third Edition, 2000.

Manufactured Home Installation in Flood Hazard Areas, FEMA-85, September 1985.

Floodproofing Nonresidential Structures, FEMA-102, May 1986.

Design Manual for Retrofitting Flood-prone Residential Structures, FEMA-114, September 1986.

Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings, FEMA-259, 1995.

Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas, FEMA-257, October 1994.

Protecting Building Utilities From Flood Damage, FEMA-348, 2000
http://www.fema.gov/library/lib06b.htm

Reducing Flood Losses through the International Code Series, FEMA, 2000
http://www.fema.gov/library/fldlossesb.htm

There are three video tapes in FEMA's "Best Build" series:

Best Build: Constructing a Sound Coastal Home
Best Build 2: Construction in a Riverine Floodplain
Best Build 3: Protecting a Flood-prone Home

These Corps floodproofing publications can be found on the following website:
http://www.usace.army.mil/inet/functions/cw/cecwp/NFPC/nfpc.htm

Hard copies can be ordered from:

U.S. Army Corps of Engineers, Tulsa District
Flood Plain Management Services
1645 South 101st East Avenue
Tulsa, OK 74128
(918) 669-7197 fax: (918) 669-7546
carolyn.schultz@usace.army.mil

Flood Proofing Systems & Techniques, December 1984. (Out of print and available only via the website)

Flood-Proofing Regulations, EP 1165 3 314, 31 March 1992.

Flood Proofing Performance—Successes & Failures, 1998.

Flood Proofing Techniques, Programs and References, January 1996.

Raising and Moving The Slab-On-Grade House, 1990.

A Flood Proofing Success Story, September 1993.

Flood Proofing: How to Evaluate Your Options, July 1993.

Flood Proofing Technology in the Tug Fork Valley, April 1994.

Local Flood Proofing Programs, June 1994

4. Documents on community floodplain management or flood hazard mitigation:

Design Guidelines for Flood Damage Reduction, FEMA-15, December 1981.

A Unified National Program for Floodplain Management, FEMA-248, May 1994.

Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials, FEMA-116, February 1987.

Floodplain Management in the United States: An Assessment Report, Summary Report, FIA-17, June 1992.

5. Documents on the natural and beneficial functions of floodplains:

Protecting Floodplain Resources, FEMA-268, September 1995.

A variety of posters and citizen information materials on watershed protection are being prepared by the Terrene Institute for the U.S. Environmental Protection Agency's Office of Wetlands, Oceans and Watersheds. Get the latest list from the Terrene Institute at (703) 548-5473.

USEPA *Wetlands Fact Sheets* and other types of assistance can be obtained by calling the USEPA Wetlands Information Hotline at 1-800-832-7828.

6. The directory of addresses of local offices that can provide more information should include names, addresses, and telephone numbers. All agencies listed should be contacted to ensure that they have the ability and are willing to provide more information. The agencies listed below should be checked.

   (a) More information about the FIRM and Flood Boundary and Floodway Map: The community's engineer, planner or building official, the State NFIP Coordinator, and the FEMA Regional Office (see Appendix A).

   (b) More information about flood insurance: Local insurance agencies and the state insurance department or NFIP Coordinator.

   (c) More information on protecting a building: Whatever agencies are providing information under Activity 360 (Flood Protection Assistance). If the community is not applying for credit under Activity 360, it should check on the services provided by the city engineer, building inspector, State NFIP Coordinator, Corps of Engineers District Floodplain Management Services Office, and Natural Resources Conservation Service District Conservationist.

   (d) More information on community floodplain management: Local or regional planning offices, State NFIP Coordinator, FEMA Regional Office, and Corps of Engineers District Floodplain Management Services Office.

   (e) More information and publications on natural and beneficial functions: State and federal agencies for environmental protection, conservation, fish and wildlife management, parks, and recreation. Regional planning agencies and local chapters of environmental and conservation organizations like American Rivers, the Izaak Walton League, and the Sierra Club, may also be able to provide information and materials for the library. To obtain CRS credit, references on natural and beneficial functions must be cataloged so that someone looking for information on floodplains will find them.

   (f) Additional information about the National Flood Insurance Program and other FEMA programs can be accessed on the website at http://www.fema.gov or by calling "FEMA FAX" at (202) 646-FEMA. FEMA FAX is a 24-hour service with a voice mail menu that leads the caller through a series of choices and sends a facsimile response to the inquiry.

b. Additional documents should be available from state, regional, local, and private sources.

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. A tutorial on designing and operating a municipal floodplain management website is available at no charge from the CRS. It is on a CD for IBM-compatible personal computers. Copies are available by calling (317) 848-2898 or e-mailing nfipcrs@iso.com.

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360 FLOOD PROTECTION ASSISTANCE

Summary of Activity 360

361 Credit Points. There is one element in this activity for a maximum of 71 points.

Flood protection assistance (FPA): Up to 71 points are provided based on the type of technical assistance that is provided.

a. 10 points for providing site-specific flood and flood-related data, such as floor elevations, data on historical flooding in the neighborhood, or similar information so inquirers can relate the flood threat to their properties.

b. 4 points for providing names of contractors and consultants knowledgeable or experienced in retrofitting techniques and construction.

c. 3 points for providing material on how to select a qualified contractor and on what recourse people have if they are dissatisfied with a contractor's performance.

d. 35 points for making site visits to review flooding, drainage, and sewer problems and providing one-on-one advice to the property owner.

e. 14 points for providing advice and assistance on the retrofitting techniques discussed in Activity 530 (Flood Protection).

f. 5 points if the person providing the advice and assistance on retrofitting techniques has graduated from the Emergency Management Institute course on retrofitting.

There is no impact adjustment for this activity.

362 Credit Calculation. The credit points for FPA are totalled.

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

a. A copy of the document the community used to publicize the service.

b. A description of the technical qualifications of the persons providing the assistance.

c. If the person is not a community employee, a copy of a letter stating that the person and/or agency has agreed to do the work..

d. [Required only 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. Records noting the date and person assisted and the type of assistance provided.

364 For More Information.

360 FLOOD PROTECTION ASSISTANCE

Credit is provided if a community provides technical advice to interested property owners and publicizes the services available.

Background: Floodplain residents are more likely to undertake activities to reduce the flood hazard to their property if reliable information is available locally. These activities include correcting local drainage problems, retrofitting existing structures, and siting and building new structures.

Activity Description: Under this activity, a qualified person must be willing and able to provide information on the flood hazard, on contractors, and on flood protection measures to inquirers. The availability of this service must be publicized at least annually.

The other activities in this series advise people to learn more about flood insurance and flood protection. The most effective public information program is direct, face-to-face communication with an expert. The best source of information on flood insurance is a flood insurance agent. This activity is designed to credit the best source of information about protecting a building from flood damage.

The objective of this activity is to provide interested property owners with general information that responds to their needs. Providing construction plans or specifications that should be prepared by an architect or engineer is not necessary. It is expected that the person providing the assistance will discuss the inquirers' situation and help them come to the appropriate solution.

The best assistance office is one that is staffed with knowledgeable and interested people. Quoting directly from books or repeating formulae are not generally effective forms of assistance. The advisors must be confident and willing to help floodplain residents. Therefore, a community should limit the assistance it provides to those topics that it is ready and willing to cover.

The assistance office could be the city engineer, building inspector, State National Flood Insurance Program (NFIP) Coordinator, U.S. Army Corps of Engineers District Floodplain Management Services office, Natural Resources Conservation Service District Conservationist, etc. It need not be local staff if other agencies have agreed to answer inquiries. Assistance can be provided by a combination of offices to secure a range of expertise.

NOTE: *This activity does not give credit for floodplain ordinance enforcement activities normally conducted by a building department, such as making site visits and/or reviewing plans to ensure that they comply with the building code.*

361 Credit Points

Maximum credit for Activity 360: 71 points.

Flood protection assistance (FPA) = The total of the following points based on which of the topics listed below are covered.

a. 10, for providing site-specific flood and flood-related data, such as floor elevations, data on historical flooding in the neighborhood, or similar information so inquirers can relate the flood threat to their properties.

This information can be obtained from flood control studies or records the community collected during past floods. Photographs and stories about floods need to include the following types of data that help describe the flood hazard to the inquirer:

- flood warning times;
- flood velocities and duration;
- depths of flooding at the inquirer's property or nearby; and
- property damage, injuries, deaths, and other information that conveys the impact of flooding on the area and its residents.

Flood elevations and building (floor) elevations both must be provided so that the flood hazard can be related to the building's needs for protection. In areas of shallow flooding, or where there is a definite reference point, such as the curb in front of the building, a flood depth will be sufficient. Simply providing base flood elevations or information taken from elevation certificates is not credited under this activity because providing this information is credited under Activities 310 (Elevation Certificates) and 320 (Map Information).

b. 4, for providing names of contractors and consultants knowledgeable or experienced in retrofitting techniques and construction.

Most property owners do not want to retrofit their properties by themselves. People want and need to know the names of companies who can do the work. Many communities have lists of such companies from their building, housing, or community development department records. Some communities and states regulate and license contractors for certain types of work.

It is important to note that this activity does not call on communities to recommend or endorse contractors or consultants. The community need only provide names and addresses or telephone numbers of licensed contractors or companies that have done the type of work the inquirer needs

done or have been licensed by the community or state to do the type of work needed. The list must be organized by specialty (e.g. house movers, plumbers, waterproofers, etc.).

c. 3, for providing material on how to select a qualified contractor and what recourse people have if they are dissatisfied with a contractor's performance.

There are many references for this type of information, including *Repairing Your Flooded Home* and *Design Manual for Retrofitting Flood-Prone Residential Structures*, (see Section 354.a.3). Other sources are local building trades councils, state licensing or registration agencies, the Better Business Bureau, city or county attorney, or a state or local consumer protection agency.

d. 35, for making site visits to review flooding, drainage, and sewer problems and providing one-on-one advice to the property owner. The visit can be to review an existing problem or to provide advice to someone contemplating developing or improving a property. A record must be kept of each visit.

e. 14, for providing advice and assistance on the retrofitting techniques discussed in Activity 530 (Flood Protection).

NOTE: *This activity does not give credit for normal building department activities such as making site visits and/or reviewing plans to ensure that they comply with the building code.*

f. Either:

5, if the person providing the advice and assistance on retrofitting techniques has graduated from the *Retrofitting Floodprone Residential Buildings* course at the Emergency Management Institute, OR

2, If the person providing the advice and assistance on retrofitting techniques has successfully completed FEMA's retrofitting home study course (IS-279) or an equivalent field-deployed course that includes a final exam that is a prerequisite to graduation

The objective is to have a knowledgeable person (other than a building contractor) directly advise a property owner on appropriate flood protection measures. This activity is not designed to provide a public service that competes with local engineers or architects. The objective is to help a property owner select the most appropriate protection measure or measures, not to prepare detailed construction specifications. Where appropriate, the technical advisor would still recommend soils analyses or structural studies.

Activity 530 (Flood Protection) provides credit for modifications that have been made to existing buildings to protect them from flooding. These techniques include elevating a building above flood

levels, floodwalls, dry floodproofing, wet floodproofing, and sewer backup protection. This element credits helping property owners to understand these retrofitting techniques and to choose the most appropriate measure.

The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. It offers a five-day course on retrofitting techniques oriented to engineers and experienced building professionals. Stipends to cover travel, registration, and rooms are usually available from FEMA. EMI also offers several independent study course, which are also free. For more information, call EMI at 1-800-238-3358 or see the EMI website at http://www.fema.gov/emi/.

Example 361.e-1. Floodville provides inquirers with flood and floor elevation data from available records. If an owner of a building without an elevation record so requests, the City Engineer will visit the site and survey the first and lowest floor elevations. The City Building Department also has an after-action report that describes the last flood, including the damage data, which it discusses with interested parties [10 points].

The City Consumer Protection Office has prepared a handout on selecting an architect, engineer, or contractor. Copies are prominently displayed in the Building Department. The handout notes that the personnel in the consumer protection office are available to talk with people and help them with problems [3 points].

The Public Works Department responds to requests and complaints from property owners who have a flood, sewer, or drainage problem. After each visit, the staff member writes a memo for the record that lists the cause of the problem, whether the City has an obligation to correct it, and recommended solutions. A copy of the letter is given to the owner [35 points].

The City does not provide advice or assistance on what retrofitting techniques are appropriate for a particular building.

FPA = 10 + 3 + 35 = 48

362 Credit Calculation

c360 = FPA

Example 362-1. Floodville's flood protection assistance procedures are discussed in the previous section: FPA = 48.

c360 = 48

363 Credit Documentation

The community must submit the following:

a. A copy of the document the community used to publicize the service. This may be through one of three kinds of outreach projects:

   1. An outreach project to the community or floodplain properties credited under OPC or OPF in Activity 330 (Outreach Projects),

   2. 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

   3. 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.

No credit is awarded if these services are not publicized each year. The applicant must note "360" in the margin of the section of the outreach project where it describes the flood protection assistance provided.

Example 363.a-1. Floodville publicizes its flood protection assistance service in the flyer it sends to all residents (see Figure 330-1). It is marked to show where the FPA publicity appears.

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 must be included.

A resume or job description is usually readily available. The description should include training or other qualifications that directly relate to the person's knowledge of the topic.

If the community is seeking credit for having the person who provides retrofitting advice and assistance graduated from the Emergency Management Institute's (EMI) retrofitting course, a copy of the certificate of graduation must be submitted. 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.

c. If the person is not a community employee, a letter stating that the person and/or agency have agreed to do the work.

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 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. Records noting the date and type of assistance given for each element under this activity.

A log similar to the one shown in Figure 320-3 will meet this requirement. Copies of written reports of site visits would also be sufficient.

364 For More Information

a. 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.

b. The U.S. Army Corps of Engineers can provide technical information and advice on flood protection measures to interested communities and individuals. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps.

c. See also Figure 530-2 in Activity 530 (Flood Protection) for a discussion of retrofitting techniques and Section 354.a.3 for references on protecting buildings from flood damage.

d. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. It offers a five-day course on retrofitting techniques oriented to engineers and experienced building professionals. Stipends to cover travel, registration, and rooms are usually available from FEMA. EMI also offers several independent study course, which are also free. For more information, call EMI at 1-800-238-3358 or your state emergency management agency's training office, or see the EMI website at http://www.fema.gov/emi/.

e. The following publication is available free. See the FEMA Order Form at the end of Appendix E.

Homeowner's Guide to Retrofitting: Six Ways to Protect your House from Flooding, FEMA-312.

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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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401 Special Hazard Areas

The Federal Emergency Management Agency (FEMA) and many communities in the United States have long recognized that the mapping and regulatory standards of the NFIP do not adequately address all of the flood problems in the country. There are many special local situations in which flooding or flood-related problems do not fit the national norm. Therefore, there are situations where the NFIP's floodplain management criteria do not adequately protect property from flood damage.

To encourage communities to address these hazards, the CRS provides credit for mapping, preserving open space, and regulating new development in areas subject to the following eight special hazards:

1. Uncertain flow paths: alluvial fans, moveable bed streams and other floodplains where the channel moves during a flood.
2. Closed basin lakes: lakes that have a small or no outlet that may stay above flood stage for weeks, months, or years.
3. Ice jams: flooding caused when warm weather and rain break up a frozen river. The broken ice floats down river until it is blocked by an obstruction, such as a bridge or shallow area, creating a dam.
4. Land subsidence: lowering of the land surface caused by withdrawal of subsurface water or minerals or by compaction of organic soils.
5. Coastal dunes and beaches.
6. Mudflow hazards: a river, flow, or inundation of liquid mud down a hillside, usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain.
7. Coastal erosion: areas subject to the wearing away of land masses caused primarily by waves on the oceans, Gulf of Mexico, and the Great Lakes.
8. Tsunamis: large ocean waves caused by an underwater earthquake or volcano.

These special hazards are addressed in separate publications. Each has a brief summary of the research findings on the nature of the hazards, mapping and regulatory techniques being used across the country, and the goals of the mapping and regulatory standards for which CRS credit is offered. They also discuss credit points and impact adjustment and credit calculation formulae for each hazard and include the worksheets needed for special hazards credit. To order copies, see Appendix E.

The credit points for mapping, preserving open space, and regulating new development in the areas affected by these hazards are calculated on the special hazards worksheets. The credits (c410SH, c420SH, c430SH, etc.) are added to the other elements in each regular activity.

402 Impact Adjustment for Areas

The activities in the 400 series provide credit for programs that improve regulatory maps or regulate areas to higher standards than the minimum NFIP program requirements. This is also true of the regulatory elements of Activity 630 (Dam Safety). The effectiveness, or impact, of a mapping or regulatory program depends upon the area affected by that program.

In many cases, some elements of a community's program will not cover all of its floodplain or all of its watersheds. In these cases, an impact adjustment ratio must be determined based upon the ratio of the affected area to the total area.

> In order to measure the impact of Activities 410, 420, 430, 440 and 630, the community must determine how much of its floodplain area is affected by each element of its mapping or regulatory program. In order to measure the impact of Activity 450, the community must determine how much of its watershed area is affected by each element of its stormwater management program.

Sections 402 through 404 discuss determining the impact adjustment ratios for these activities:

410 (Additional Flood Data)

420 (Open Space Preservation)

430 (Higher Regulatory Standards)

440 (Flood Data Maintenance)

450 (Stormwater Management)

> Impact adjustment ratios are variables with a lower case "r" preceding the acronym for the element.

Example 402-1. The acronym for freeboard credit is FRB. The acronym for the impact adjustment ratio for freeboard credit is rFRB.

> A few elements do not have impact adjustment ratios. If these elements are not effective throughout the community, no credit is provided.

In Activity 440 (Flood Data Maintenance), a minimum requirement is established for ERM (Elevation Reference Marks). There is no credit for ERM if this requirement is not met.

In Activity 450, there is no credit for ESC (Erosion and Sediment Control Regulations) unless it is effective throughout the community. There is no credit for FRX unless it is effective throughout the B, C, and D or X Zones.

A community has three options for determining the values of most of the impact adjustment ratios that are based on area. A community may use one option for some elements and another option for other elements. Options may not be mixed within an element.

a. (Option 1) Where an element is effective throughout the area of the denominator, the impact adjustment ratio = 1.0 for that element.

If an element is effective throughout the area of the denominator for that activity, it is not necessary to determine the area. The impact adjustment ratio for that element is 1.0, which gives the highest possible credit for that element.

Elements in Activities 430 (Higher Regulatory Standards), 440 (Flood Data Maintenance), 450 (Stormwater Management), and 630 (Dam Safety) are most likely to have impact adjustment ratios of 1.0. Although most regulatory programs cover the entire floodplain, sometimes a standard applies only to part of the floodplain. For example, different freeboard requirements may be applied to coastal and riverine floodplains.

Example 402.a-1. A community's only request for credit in the 400 series is for regulation of a freeboard requirement in Activity 430. The freeboard requirement is applied to all of the Special Flood Hazard Area (SFHA) shown on its Flood Insurance Rate Map (FIRM). Using Option 1, rFRB = 1.0.

Example 402.a-2. Another community requires freeboard in all riverine floodplains, but not in coastal floodplains. This community cannot use Option 1 for FRB because the element is not effective throughout the entire regulated floodplain.

NOTE: *If a community applies for credit for Activity 420 (Open Space Preservation), it is saying that certain areas are preserved from development. Higher regulatory standards have no impact in those open space areas. Therefore, the impact adjustment ratios for the elements in Activity 430 (Higher Regulatory Standards) cannot be 1.0 if the community receives credit for open space preservation in Activity 420.*

In other words, a community that applies for credit in both Activities 420 and 430 cannot have an impact adjustment ratio of 1.0 for either of them. The Option 1 impact adjustment ratio formula for Activity 430 accounts for this by subtracting the impact adjustment ratio used in Activity 420.

Example 402.a-3. A community applies for credit for open space (OS). It has a freeboard requirement (FRB) for development throughout its floodplains. It determines that 25% of its floodplain is open space. Therefore, it can only receive FRB credit for 75% of its floodplain. The Option 1 formula for freeboard in Activity 430 is 1.0 - 0.25 = 0.75.

b. (Option 2) A community may use a "default value" for one or more of its impact adjustment ratios. The Impact Adjustment section for each activity lists the default value for each element in that activity.

Each of these activities has default values for its elements. A community may use one or more of these default values if:

1. It cannot or chooses not to measure the areas necessary to calculate the impact adjustment ratio(s) as discussed in 401.c., below; or

2. It concludes that the default value for the impact adjustment ratio(s) is greater than the calculated value(s).

Example 402.b-1. Someburg has a city park in its floodplain that qualifies for OS (open space preservation) credit in Activity 420. However, Someburg does not have time to measure the areas affected before applying for the CRS. Someburg uses the default value, rOS = 0.05, in its application for CRS credit.

Example 402.b-2. Gulf Beach County has many square miles of floodplain, including two county parks within the SFHA. The parks qualify for OS (open space preservation) in Activity 420. The default value for rOS (the impact adjustment ratio for open space preservation) is given as 0.05 in Section 423. The County estimates that the area of the parks (aOS) is about 3% of the area of its regulated floodplains (aRF). Gulf Beach County uses the default value rOS = 0.05 because it provides more credit for Activity 420.

c. (Option 3) The value of an impact adjustment ratio is determined by dividing the area affected by an element by the appropriate denominator. The denominator for the elements in each activity is specified in the Impact Adjustment section for the activity.

For each element with an impact adjustment ratio, the area affected by the element is designated by a lower case "a" followed by the acronym for that element. The area of the denominator is designated as aSFHA (for the area of the SFHA), aRF (for the area of the regulated floodplain, or aW (for the area of the watershed).

In each of these activities there is an Impact Adjustment section. The denominator and formulae for impact adjustment ratios for each element in that activity are listed in that section. A brief description of the denominators follows.

410 (Additional Flood Data): aSFHA, the area of the Special Flood Hazard Area (on the community's FIRM);

420 (Open Space Preservation): aRF, the total area of regulated floodplain within the community;

430 (Higher Regulatory Standards): aRF, the total area of regulated floodplain within the community;

440 (Flood Data Maintenance): aRF, the total area of regulated floodplain within the community;

450 (Stormwater Management): aW, the total area of watershed affecting the community; and

630 (Dam Safety): aRF, the total area of regulated floodplain within the community.

Example 402.c-1. In its floodplain, a city has a park that covers 47 acres. This park qualifies for OS (open space preservation) credit in Activity 420 (aOS = 47). Using Option 3, the city determines that the area of its regulated floodplain (aRF) is 175 acres (aRF = 175). For this city,

$$rOS = \frac{aOS}{aRF} = \frac{47}{175} = 0.27$$

In summary, there are three ways to determine impact adjustment ratios based upon the area affected for Activities 410, 420, 430, 440, 450, and 630.

Example 402.c-2. North Shore requests credit for OS (open space preservation) in Activity 420. The city cannot use Option 1 because its open space areas do not cover the entire floodplain. It could use Option 2 for an impact adjustment ratio of 0.05. As explained in Example 404-2, North Shore uses Option 3 to obtain a higher impact adjustment ratio of 0.42.

In Activities 430 (Higher Regulatory Standards) and 440 (Flood Data Maintenance), North Shore uses Option 1 because the higher standards apply throughout its floodplain and it has Digitized Parcel Data for all of the lots in its floodplain.

In Activity 450 (Stormwater Management), the city uses Option 2 to determine the values of the impact adjustment ratios. Even though much of the watershed area affecting North Shore is regulated by neighboring communities, the city cannot obtain documentation from these communities in order to calculate a higher impact adjustment ratio.

403 Impact Adjustment Map (Option 3)

a. If a community uses Option 3 as discussed in 402.c for Activities 410, 420, 430, 440 and/or 630, it must prepare an Impact Adjustment Map showing the area affected by each element of those activities and the area of the denominator (aSFHA for Activity 410, aRF for the other activities).

The Impact Adjustment Map needed for Activities 410, 420, 430, 440, and 630 shows the community's floodplains and the areas where each element in these activities is effective. This map may also be helpful if the community applies for credit for Activity 620 (Levee Safety).

An Impact Adjustment Map may be prepared on any convenient base map, as long as the scale is suitable for the determination of the areas. If the FIRM or other floodplain map is not used as the base map, the floodplain boundaries and the areas of each element must be drawn on the map with sufficient accuracy that the areas may be verified.

No new studies are required to produce an Impact Adjustment Map. The areas are identified and marked on the map based upon the areas under the jurisdiction of the community's regulatory programs. Many communities have developed a map that meets the requirements of Option 3 for their own management purposes. Previous CRS applicants have found the Impact Adjustment Map they developed for CRS credit helpful as a visual presentation of their floodplain management programs. It identifies where the problems are and where the community is dealing with those problems.

Selection of an appropriate base map for the Impact Adjustment Map depends on the size of the community and the elements for which it is requesting credit.

- If a community is relatively small, a copy of the FIRM may be the best base map. This approach is used by Floodville (see Figure 410-1).
- If a community is large in geographic area and its FIRM includes many panels, it may use a base map with a smaller scale so that the Impact Adjustment Map fits on a few sheets. The floodplains may already be drawn on the base map (e.g., a zoning map with the regulated

areas shown), or they may have to be drawn on the base map. This approach is used by North Shore (see Figure 400-3).

- If the community is requesting credit for mapping and regulation of areas outside the SFHA shown on its FIRM, these areas must be drawn on the Impact Adjustment Map.
- If a community has a geographic information system that includes its flood data, it may produce maps from that system.
- If a community is large and has different standards for urban and rural areas, maps of differing scales may be needed.
- A community applying for credit under a number of different elements may choose to use overlays to display the elements separately. The Watertown example shows a base map (see Figure 400-1) and one overlay (see Figure 400-2).

Deciding what base maps to use depends upon the detail required and the overall bulk of the maps. If maps other than the FIRM are used as base maps, all appropriate NFIP zones should be transferred from the FIRM to the base maps (see Figure 400-2).

The Impact Adjustment Map for Activities 410, 420, 430, 440 and/or 630 must show areas that are excluded from the impact adjustment calculations. Four types of areas are excluded from the mapped and regulated areas, even if they are within the SFHA shown on the FIRM:

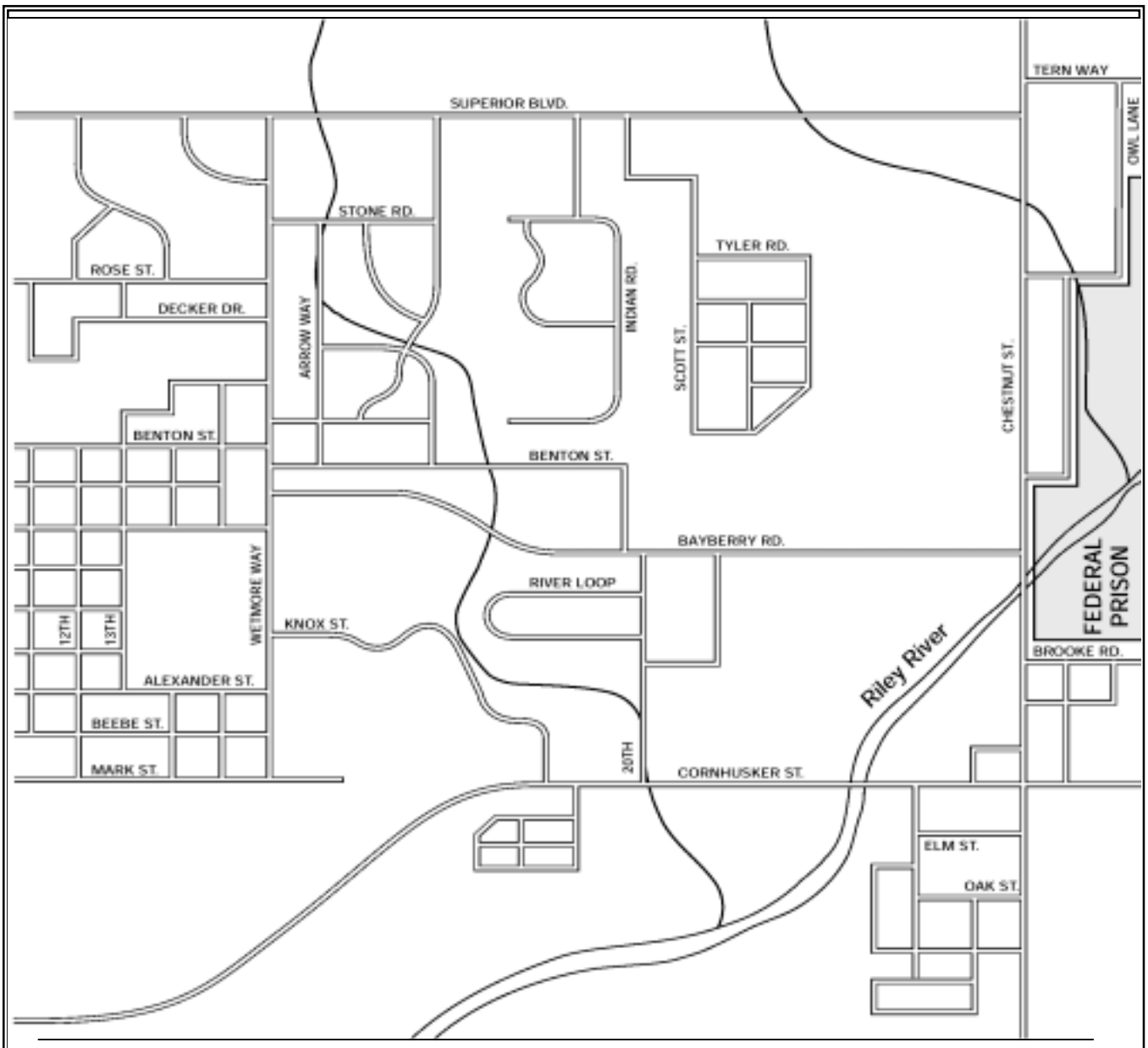
1. Open waters larger than 10 acres, such as lakes, bays, and large rivers;

2. Lands larger than 10 acres that are either owned by the federal government, such as military installations and national parks, or where development is prohibited by the federal government; and

3. At the community's option, areas beyond the community's regulatory jurisdiction. The community may include or exclude non-federal areas it does not have the authority to regulate, including land owned by the state or another community, and Indian reservations, provided such areas are treated consistently for all of these activities.

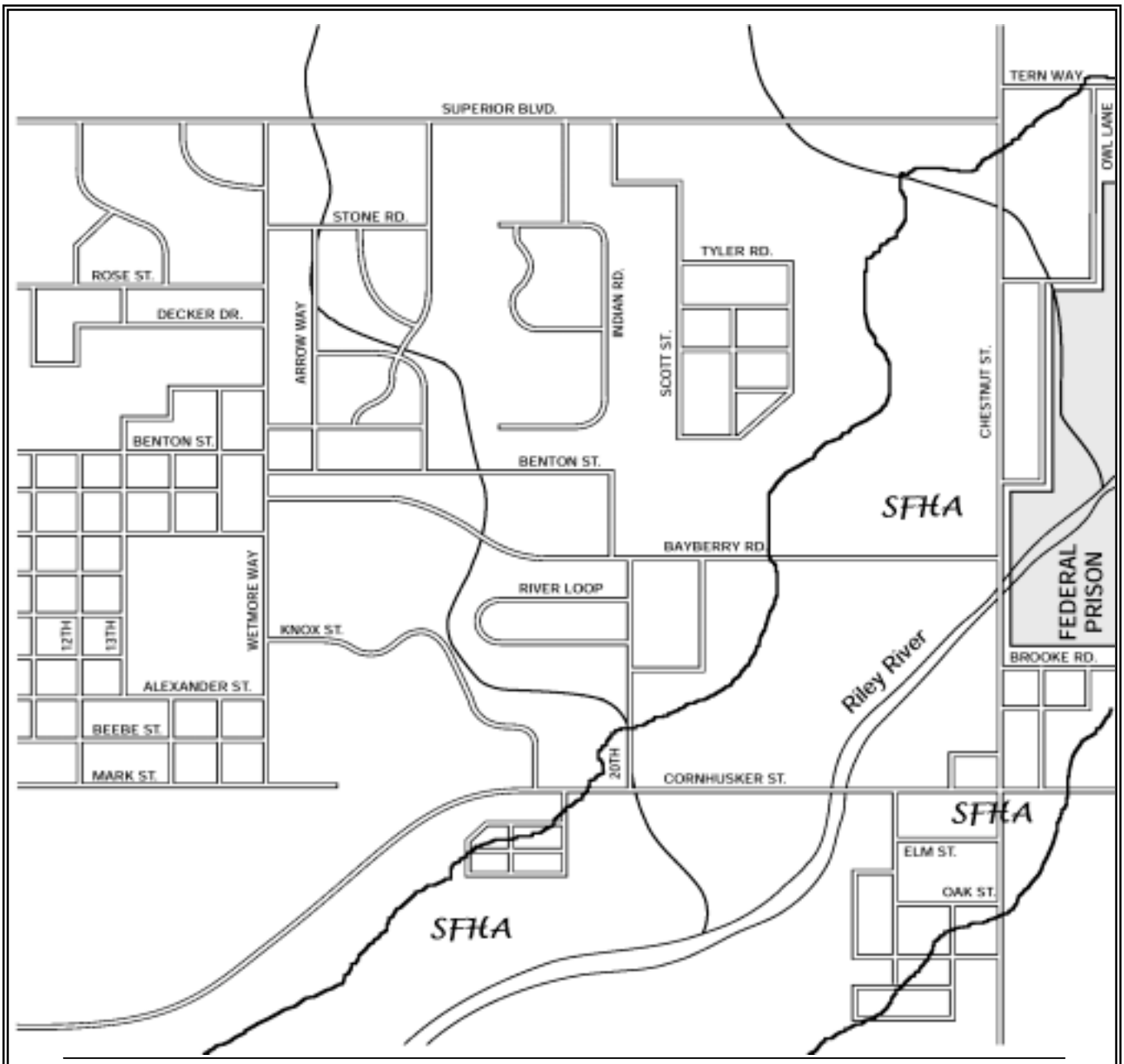
4. A99 and AR Zones. These zones are not considered part of the regulatory floodplain for CRS purposes. Floodplain management requirements in these zones are less than those required in other zones and these areas already receive substantially reduced flood insurance premiums, which would duplicate CRS discounts.

The intent of these exclusions is to remove areas from CRS credit calculations that are not actually affected by the community's floodplain management program. The test for exclusion for the first three areas is whether the community has authority to regulate these areas, and whether they are actually subject to development.



City of Watertown Street Map

Figure 400-1. Watertown's base map.



Impact Adjustment Map

Area	Size (sq. miles)	Notes
SFHA	0.43	Does not include federal prison

Figure 400-2. Watertown's base map with an overlay.

Excluding water bodies and land over which the community has no regulatory control will generally increase the community's CRS credit because the denominator will be reduced. However, if a community can provide documentation that non-federal land over which it has no regulatory jurisdiction is eligible for CRS credit, it may include such areas.

Example 403.a-1. North Shore's corporate limits extend one-half mile into Lake Michigan. Although a portion of this area is included in the SFHA shown on the FIRM, it is excluded from aRF on North Shore's Impact Adjustment Map (see Figure 400-3).

If these excluded areas are within the floodplains shown on the base maps, they should be identified with a distinctive shading or color. Otherwise, they should be excluded from the base map (see Figure 400-3). The following guidelines may help.

- To determine the extent of large water bodies, use the shoreline shown on the FIRM.
- For large rivers, designate reaches where the average width (bank to bank) shown on the FIRM exceeds 500 feet.
- Large areas of federal lands and Indian reservations are probably already shown on the FIRM as "Areas Not Included." If these areas have mapped SFHAs, and if they are larger than 10 acres, they must be excluded. Smaller parcels, such as post offices and federal office buildings, need not be excluded.
- In a few areas, federal regulations prohibit development. These may include coastal wetlands and lands leased from a federal agency. Because federal regulations allow development that meets certain criteria in upland wetlands and designated coastal barriers, these areas should not automatically be excluded from the regulatory floodplain.
- Land owned by the state, county, or other jurisdiction is probably exempt from the community's regulatory authority. These lands must be treated consistently. If they are included in the floodplain for open space credit, they must be included in the floodplain for all activities. If they are open space, the community will generally receive more credit if they are included. These areas are included in the area of regulation and the denominator only if the community can document that a regulatory standard is in force under the appropriate jurisdictional authority.

Example 403.a-2. The corporate limits for the town of Riverpark include a state park with 120 acres in the SFHA shown on its FIRM. The town obtains a letter from the State Park Commission stating that the park will be maintained as open space. Riverpark includes the state park in its aRF.

Without the park, aOS = 0, so rOS = 0 and c420 = 0.

With the park included in its aRF, aRF = 150, aOS = 120, rOS = 0.80, and c420 = 580 credit points. If Riverpark applies for credit in Activities 430 (Higher Regulatory Standards) or 630 (Dam Safety), that credit will be reduced, because the impact adjustment ratios for elements in those activities will be smaller (see Sections 432 and 632).

The Impact Adjustment Map for Activities 410, 420, 430, 440 and/or 630 must show the areas affected by each element for which CRS credit is applied. Each area must be marked with the acronym for that element.

Example 403.a-3. OS is the acronym for open space preservation in Activity 420. Each area for which OS credit is requested must be designated on the Impact Adjustment Map (see Figure 400-3).

In some cases, a note on the map or in the legend may be simpler and clearer than shading. For example, if a community regulates all of its area of regulatory floodplain for freeboard (FRB), it could use the note "aFRB = aRF - aOS," since regulatory credit is not given for areas of open space (see Figure 400-3).

Example 403.a-4. North Shore excludes areas of Lake Michigan beyond the shoreline and places a note on its Impact Adjustment Map stating, "Lake Michigan not included as floodplain" (see Figure 400-3).

All appropriate areas for numerators and denominators for impact adjustment ratios must be included in a legend on the Impact Adjustment Map.

b. If a community uses Option 1 or 3 as discussed in Sections 402.a and 402.c for Activity 450 (Stormwater Management), it must prepare a Stormwater Impact Adjustment Map that shows the area affected by its stormwater management program and the watersheds that affect the community. This map and the areas needed to develop it are discussed in Section 452.

Because Activity 450 (Stormwater Management) is adjusted according to watershed areas rather than floodplain areas, a separate Impact Adjustment Map is required. However, the requirement for this map is unrelated to the options a community uses for its other impact adjustment ratios. Instructions for preparing the map are in Section 452.

c. A community may use a different option for each element for which it requests credit under Activities 410, 420, 430, 440, 450 and/or 630. If the community uses the default values in Option 2 for its application, but has prepared an Impact Adjustment Map(s) before the verification visit (see Section 232) that provides more credit for some or all of the elements, the higher credit will be used for the community's verified CRS classification.

Example 403.c-1. Floodville prepares its modification requesting credit for open space preservation. The CRS Coordinator does not have time to prepare the Impact Adjustment Map, so she uses Option 2: rOS = 0.05 (the default value in Section 422).

rOS = 0.05, and cOS = OS x rOS = 725 x 0.05 = 36.25

Before the verification visit, she prepares the Impact Adjustment Map (see Figure 420-1), showing the area of regulated floodplain (aRF) in Floodville and the area of open space preservation (aOS). She determines the areas using the techniques discussed in Section 404. She determines that aOS = 87.5 and aRF = 396, so using Option 3 gives:

$$rOS = \frac{aOS}{aRF} = \frac{87.5}{396} = 0.22, \text{ and } cOS = OS \times rOS = 725 \times 0.22 = 159.5$$

Floodville's initial default credit of 36.25 points in its modification is increased to 159.5 points for the requested credit.

404 Area Calculations

Determination of the size of areas for the Impact Adjustment Map(s) may be done by any method that yields reasonably accurate results. The community must document the method or methods used to determine the areas.

Any method that provides measurements of the areas affected may be used. The community should not spend an inordinate amount of time measuring areas solely for determination of CRS impact adjustment ratios. The following approaches are acceptable:

- Mechanical or computerized planimetry methods (including a geographic information system);
- Areas computed by HEC-2 or other standardized step-backwater methods;
- Known property dimensions, such as those for a city park; or

- Use of a grid overlay: a transparent grid is placed on the map, the grid squares within an area are counted, and the map scale is used to determine the actual area.

Rural communities may request help from the U.S. Natural Resources Conservation Service in preparing the Impact Adjustment Map and measuring the areas. Requests should be submitted to the local Soil and Water Conservation District, which is usually located in the county seat.

> All area calculations must use the same units, either acres or square miles.

Smaller communities will probably find it easier to measure in acres, while a larger community, such as a county, may prefer to use square miles. The following formulae may be helpful:

- To convert acres to square miles, divide the number of acres by 640.
- To convert square miles to acres, multiply the number of square miles by 640.
- To convert square feet to acres, divide the number of square feet by 43,560.
- To convert square feet to square miles, divide the number of square feet by 27,878,400 (that is, $5{,}280^2$).

Example 404-1.

$$32 \text{ acres} = \frac{32}{640} = 0.05 \text{ square miles}$$

2.2 square miles = 2.2 x 640 = 1,408 acres

2,500 feet x 3,600 feet = 9,000,000 square feet

$$\frac{9{,}000{,}000}{43{,}560} = 207 \text{ acres}$$

$$1{,}000 \text{ feet} \times 2{,}142.5 \text{ feet} = 2{,}142{,}500 \text{ square feet} = \frac{2{,}142{,}500}{27{,}878{,}400}$$

= 0.077 or 0.08 square miles

The following example discusses how the fictitious city of North Shore developed its Impact Adjustment Map for Activity 420 (Open Space Preservation). It shows how the community selects a base map and uses various methods to determine the areas affected by the activity.

Example 404-2. North Shore is a city on Lake Michigan subject to flooding from the Lake and from North Shore Channel. It is applying for credit under Activity 420 using Option 3 and an Impact Adjustment Map.

North Shore's FIRM is on four panels, so the city uses a street map prepared for the city by a commercial map firm in 1992. This map is current and shows the city parks, for which open space credit is requested (see Figure 400-3).

Using features on the base map, including street intersections and the Lake Michigan shoreline, the CRS Coordinator transfers the floodplains from the FIRM to the base map. The city does not regulate any areas outside the SFHA shown on its FIRM, so the SFHA (excluding Lake Michigan beyond the shoreline) is the area of regulated floodplain (aRF).

Next, the CRS Coordinator locates all open space within the floodplains. Only open space areas that meet the requirements of Section 421.a are designated on the Impact Adjustment Map. City parks are shown as shaded areas on the original base map. The CRS Coordinator has shown the other open space areas with crosshatching.

The CRS Coordinator uses a grid square overlay to calculate the area of regulated floodplain within the city. The base map is at a scale of 3,000 feet per inch. Using a grid with six squares to the inch, the side of each square is 3,000'/6 = 500'. 1 grid square = 500' squared = 250,000 square feet. There are 43,560 square feet to an acre, so the number of acres per grid square is 250,000 divided by 43,560 = 5.74 acres per grid square.

In 10 minutes, the CRS Coordinator counts 211 grid squares in the aRF.

$$\text{aRF} = 211 \text{ grid squares} \times \frac{5.74 \text{ acres}}{\text{grid square}} = 1{,}211 \text{ acres}$$

There is an area of open space that runs along North Shore Channel from the southern corporate limits to Central Park. This area was purchased and cleared by the City to be developed as a greenway. The grid overlay includes 37 grid squares within this area, so this portion of aOS = 37 x 5.74 = 212 acres.

North Shore's CRS Coordinator uses the city's parcel records to determine the amount of city parkland in the floodplain (in acres):

Sheridan Park	5.1
Gillison Park	74.6
Central Park	68.6
Centennial Park	46.0
	194.3

The Lakefront Golf Club is entirely in the floodplain. The parcel records show that it is 48 acres.

Lake Michigan University reports that 80 acres of its campus are athletic fields and woodland and will remain so. Approximately 2/3 of it is in the floodplain.
80 x 2/3 = 53 acres.

The open space areas on North Shore's Impact Adjustment Map are (in acres):

North Shore Channel Greenway lands	212.0
City parks	194.3
Lakefront Golf Club	48.0
Lake Michigan University	53.0
Total area of open space (aOS)	507.3

North Shore cannot use Option 1 for its impact adjustment because it does not have 100% of its floodplain as open space.

If North Shore uses Option 2, the impact adjustment ratio for open space, rOS, would be 0.05.

Using Option 3, $rOS = \frac{aOS}{aRF} = \frac{507.3}{1{,}211.0} = 0.42$

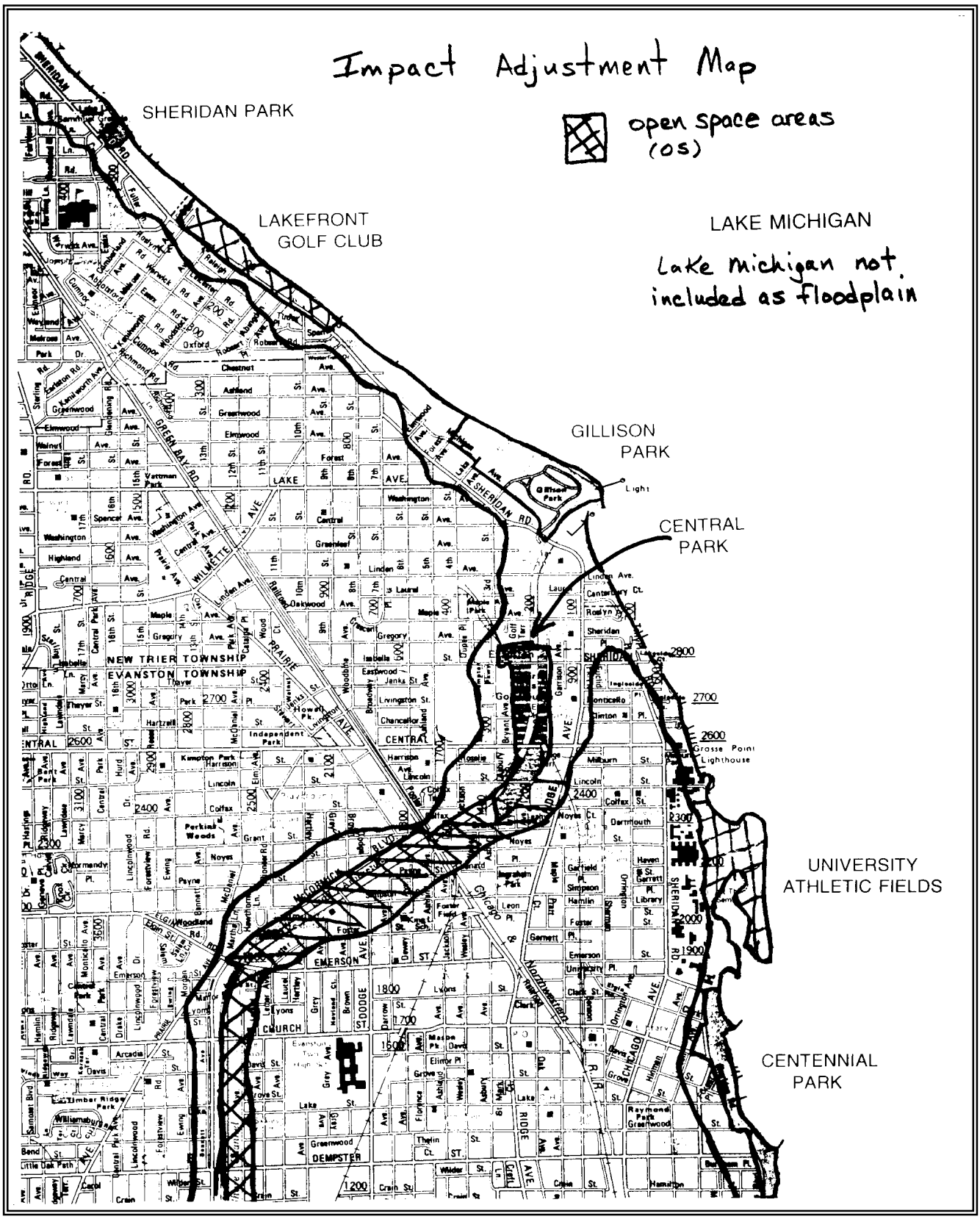


Figure 400-3. North Shore's Impact Adjustment Map.

410 ADDITIONAL FLOOD DATA

Summary of Activity 410

411 Credit Points. Additional flood data (AFD) credit is provided for portions of the floodplain that are mapped and managed to standards exceeding the minimum requirements of the National Flood Insurance Program (NFIP). Six elements make up AFD for a maximum of 1,373 points (excluding special hazards credit).

a. Regulatory flood elevation (RFE): Up to 250 points are provided for developing new flood elevations that are used in the community's regulatory program.

b. Additional data standards for the new study (ADS): Up to 165 points are provided if the community's new study included a floodway or V Zone, or if it was based on future conditions hydrology, or was approved by a state review program.

c. More restrictive floodway standard (FWS): Up to 200 points are provided based on the allowable floodway surcharge used in the study.

d. Non-FEMA share (NFS): Up to 200 points are provided if the community or entity other than the Federal Emergency Management Agency (FEMA) paid for part of the cost of the Flood Insurance Study.

e. Additional flood data for special hazards (AFDSH): Up to 50 points are provided if the community maps and regulates areas of special flood-related hazards.

f. Cooperating Technical Partner (CTP): Up to 143 points are provided if the community, appropriate regional agency, or state has a signed, qualifying CTP agreement with FEMA.

412 Impact Adjustment. The credit points for each element are adjusted in one of three ways.

a. Under Option 1, if the standards apply throughout the Special Flood Hazard Area (SFHA), the impact adjustment ratio for an element is 1.0.

b. Under Option 2, if the standards do not apply throughout the SFHA, a default impact adjustment ratio of 0.1 may be used.

c. Under Option 3, the impact adjustment ratios may reflect the proportion of the SFHA affected by the element. The ratio may be as high as 2.0 if the community maps and regulates floodplains outside of the SFHA.

413 Credit Calculation. The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

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

a. The ordinance or law that adopts the map or standard.

b. A copy of the study or technique used, an explanation of the technique used, and a licensed engineer's statement that the study was based on a technique approved by FEMA, or documentation that the study or technique has been reviewed and accepted by FEMA.

c. [If applying for ADS credit for state review under Section 411.b] Documentation that the state has reviewed and accepted the study or analysis techniques for which credit is being requested.

d. [If applying for NFS credit under Section 411.d] Documentation of the non-FEMA share of the flood insurance study.

e. [If the impact adjustment factors were based on Option 3 (412.c)] The Impact Adjustment Map.

f. [If the community is requesting credit for CTP2 undeer Section 411.f] Documentation of the relation between the study or standard and the CTP agreement.

415 For More Information.

410 ADDITIONAL FLOOD DATA

Credit is provided for developing floodplain maps and flood data in areas where FEMA did not provide such data.

Background: Regulation of new development depends on good floodplain mapping and related flood hazard data. Most communities in the National Flood Insurance Program (NFIP) have a Flood Insurance Rate Map (FIRM). Most FIRMs have detailed data for at least some of the communities' flood hazard areas. However, many communities still have flood problem areas where detailed data were not provided by FIMA with the FIRM. As a result, new development is often less well-protected from flood damage.

There are two types of areas shown on FIRMs: detailed mapping and approximate mapping. The primary difference between the two is that detailed maps include the base flood elevations needed to set minimum protection levels for new buildings. In most riverine situations, NFIP detailed mapping also includes floodway delineations. In coastal areas, detailed mapping may include delineation of a velocity or V Zone.

NFIP regulations for areas with approximate mapping, also known as "unnumbered A Zones" (44 *CFR* 60.3(b)), are not as effective in reducing flood damage as regulations for areas with detailed map data. Because no base flood elevations have been determined, many of the regulatory requirements are left to the judgement of community officials. Flood elevations are required only for large subdivisions or if a flood study has already been done. These areas are often on the urban fringe and therefore can be subject to development before the traditional flood insurance study approach can provide the needed data.

Flood hazard areas that were not mapped as Special Flood Hazard Areas (SFHAs) during the preparation of the community's FIRM have no floodplain management requirements under the NFIP. Additional mapping may have been prepared by or for the community for several reasons:

- New delineations were necessary because conditions changed since the flood insurance study was done;
- Development in a floodplain since the flood insurance study warranted additional mapping or more accurate data;
- The community wanted to regulate areas that were not mapped by FIMA because they did not meet the NFIP mapping criteria (e.g., the drainage area was less than 1 square mile); or
- Areas that may or may not have been mapped as part of the flood insurance study have hazards that were not adequately mapped (e.g., alluvial fans or areas subject to subsidence).

Activity Description: This activity provides credit for regulating areas based on flood data not provided with the community's FIRM or on a flood study conducted to a higher standard than the Federal Emergency Management Agency's (FEMA's) flood insurance study criteria. Credit is also provided if the community shared in the cost of a flood insurance study.

All higher-standard mapping receives credit, even if it is included in the community's FIRM. For example, many states require floodway regulations to be based on criteria more restrictive than the NFIP mapping standard. In those states, the flood insurance study met the requirements of state law and the higher-standard mapping can be credited under this activity (Section 411.c).

All areas outside the designated SFHA that are mapped and regulated receive credit provided they meet or exceed the NFIP standards.

411 Credit Points

Maximum credit for Activity 410: 1,373 points.

Additional flood data (AFD) credit is provided for portions of the floodplain that are mapped and managed to higher standards than the NFIP minimum requirements. Additional credit is available if FEMA did not pay for the entire study.

There are four typical ways for a community to receive credit under this activity:

1. Credit is provided for developing base flood elevations and other data in areas not mapped as SFHA (i.e., B, C, D, and X Zones) or mapped with approximate methods (i.e., unnumbered A or V Zones). These areas do not have flood data provided with the FIRM so detailed data provided by the community, the state, a developer, or other non-FEMA source would be creditable additional flood data. This is the most common way credit is provided under this activity. It is discussed in Section 411.a, Regulatory Flood Elevation.

2. If FEMA studied an area with detailed methods and provided base flood elevations on the FIRM (i.e., AE, VE, and numbered A and V Zones), then there are several ways a state or community program could receive credit for providing data that exceed FEMA's study standards. It is recommended that the person preparing the application for this approach be familiar with *Flood Insurance Study Guidelines and Specifications for Study Contractors*, FEMA 37, 1999. This book explains the minimum FEMA study criteria. Activity 410 provides credit for studies that exceed those criteria in areas where the FIRM provided base flood elevations. See Sections 411.b and c.

3. A third instance in which a community's or state's flood data may be credited is when an agency other than FEMA has paid for the study. Flood data developed by communities, states, developers, the U.S. Army Corps of Engineers, or the Soil Conservation Service would receive credit provided the agency was not paid by FEMA for the work. Cost-sharing on the original flood insurance study or subsequent revisions would be credited based on the non-FEMA share. See Section 411.d.

4. Some special flood-related hazards have not been adequately addressed on most FIRMs. They are listed in Section 401. Mapping these special hazards is discussed in the separate publications that are listed in the special hazards section of Appendix E.

Example 411.1 Some areas could be identified on the Impact Adjustment Map and marked "AFD1," "AFD2," etc. for each zone that has a different type of study or additional data. Examples include the following.

- Unnumbered A or V Zones for which the community has base flood elevations and regulates new construction using those elevations.
- A riverine floodplain for which FEMA did not define a floodway, but the community has adopted one.
- Unnumbered A or V Zones within which the community calculates or requires developers to calculate base flood elevations and/or floodways for their sites as a condition of permit approval.
- A floodplain in a B, C, or X Zone that the community has mapped and regulates using base flood elevations.
- Areas covered by studies that have been reviewed and approved by the state.
- A floodplain mapped on the FIRM with a technique that exceeds FEMA's guidelines, e.g., using future conditions hydrology.
- Any flood hazard data that are based on a technique that results in more restrictive regulations than FEMA's guidelines, e.g., a floodway based on a smaller surcharge than FEMA's 1-foot standard.
- A floodplain mapped on the FIRM, if the community helped pay for the mapping.
- An area for which additional flood mapping was done to account for one of the special flood hazards, such as alluvial fans or closed basin lakes.

a. Regulatory flood elevation (RFE) (Maximum credit: 250 points).

Credit for RFE is provided if the community obtains and uses new base flood elevation data in its floodplain development regulations. The new elevation data must be based on a FEMA-approved technique or specifically approved by the FEMA Regional Office.

There is no credit for maps or studies funded in whole or in part by FEMA. Credit for FEMA-funded studies is provided in Section 411.d, Non-FEMA share (NFS).

The credit points are based on the FIRM zone and the type of study that produces the regulatory flood elevation.

1. If base flood elevations are provided in an unnumbered A or V Zone (i.e., an SFHA without base flood elevations), then RFE = either

   (a) 75, if the elevations are provided for a single site at the time of development,

   (b) 110, if the elevations are provided in a profile prepared for a relatively long reach of a stream or shoreline,

   (c) 140, if the profile is submitted to FEMA with a request for a map revision,

   (d) 150, if the profile is part of a comprehensive watershed study, or

   (e) 190, if the profile is part of a comprehensive watershed study that is submitted to FEMA with a request for a map revision.

2. If base flood elevations are provided in a B, C, D or X Zone (i.e., an area not mapped as SFHA), then RFE = either

   (a) 100, if the elevations are provided for a single site at the time of development,

   (b) 150, if the elevations are provided in a profile prepared for a relatively long reach of a stream or shoreline,

   (c) 190, if the profile is submitted to FEMA with a request for a map revision,

   (d) 200, if the profile is part of a comprehensive watershed study, or

   (e) 250, if the profile is part of a comprehensive watershed study that is submitted to FEMA with a request for a map revision.

3. If new base flood elevations are provided in an AE, VE, or A or V numbered zone (i.e., an SFHA with base flood elevations) and the new elevations are higher than the ones shown on the FIRM, then RFE = either

   (a) 75, if the elevations are provided in a profile prepared for a relatively long reach of a stream or shoreline,

   (b) 90, if the profile is submitted to FEMA with a request for a map revision,

   (c) 100, if the profile is part of a comprehensive watershed study, or

(d) 150,	if the comprehensive watershed study is submitted to FEMA with a request for a map revision.

For each type of FIRM zone, the credit varies according to five factors:

1. The lowest value for RFE is for providing elevations for a single site at the time of development. Many floodplains without base flood elevations have low development potential and do not warrant extensive detailed studies. Many communities regulate these areas by requiring developers to calculate a flood elevation for the site at the time of application for a development permit.

   The credit for "if the elevations are provided for a single site at the time of development" is based upon the regulatory requirement. If the appropriate language is in the community's ordinance, the credit is provided, even if the areas have not yet been studied. What counts is that a regulatory flood elevation will be provided before the areas are developed.

   Sometimes the calculations are done by the community or another agency. In some cases the community has the developer provide some data, such as a topographical survey, and then a municipal engineer or other person calculates the base flood elevation for the site. These are creditable approaches. It does not matter who does the work as long as a regulatory flood elevation is available in time to have new buildings protected to or above the base flood elevation.

   There is no credit for meeting the minimum NFIP requirements to ". . . obtain, review and reasonably utilize available data . . ." or that developers of subdivisions larger than 5 acres or 50 lots provide flood elevation data. These are minimum requirements of the NFIP (44 *CFR* 60.3(b)(3) and (4)). To receive this credit for RFE, the ordinance must require the data for ALL development permit applications to build or substantially improve buildings in the regulated floodplain.

2. More points are obtained "if the elevations are provided in a profile prepared for a relatively long reach of a stream or shoreline." For this credit, the area is studied before an application for a development permit and the study covers a larger area.

   Because there would be more than one base flood elevation for a longer reach of stream, the elevations are shown on a profile. For the purposes of this activity, the credit for a "profile" includes base flood elevations in coastal floodplains, depths in AO Zones, and similar situations where a large area has base flood elevations even though a graphic "profile" is not applicable.

   To receive this higher credit, the community must adopt the study and regulate development to the same standards as in an SFHA for which FEMA provided base flood elevations (i.e., as if the area were an AE, VE, or A or V numbered Zone).

3. More credit is provided if the study data, i.e., the profile, are submitted to FEMA with a request for FIRM revision. Credit for submitting base flood elevations to FEMA with a request for a map revision must be documented with copies of the request on FEMA Form MT-2.

   Credit is not provided if FEMA denies the request because the study was not prepared in accordance with FEMA mapping standards. However, credit is provided if FEMA does not immediately publish the map revision, as long as it does not deny the request.

4. Higher credit is provided if the elevations were developed as part of a comprehensive watershed study. A hydrologic and hydraulic study that looks at the entire watershed, rather than just one reach of a stream, will produce better data. Such studies may be part of a stormwater management plan credited under Activity 450 (Stormwater Management).

5. The most credit is provided if a watershed study is submitted to FEMA for a map revision.

The credit points for this element are displayed in tabular form in Figure 410-1 to show how the points are based on the type of study and the FIRM zone.

***NOTE 1**: This credit is not available for flood elevations produced by a flood insurance restudy, limited map maintenance project, or other study financed by FEMA. Credit for FEMA-funded studies is provided in Section 411.d, Non-FEMA share (NFS).*

NOTE 2:** The technique used in the study or the ordinance language must meet the minimum standards explained in **Flood Insurance Study Guidelines and Specifications for Study Contractors.** The technique must be submitted to the FEMA Regional Office for review and approval only if it is not listed as an acceptable one in **Guidelines and Specifications.

Type of study	**A or V**		**B, C, D or X**		**AE, VE, A#**	
	Sect.	Score	Sect.	Score	Sect.	Score
Site specific at time of development	1(a)	75	2(a)	100	n/a	
Profile or length of shoreline	1(b)	110	2(b)	150	3(a)	75
Profile with request for FIRM revision	1(c)	140	2(c)	190	3(b)	90
Profile from comprehensive watershed study	1(d)	150	2(d)	200	3(c)	100
Watershed study w/FIRM revision request	1(e)	190	2(e)	250	3(d)	150

"Sect." refers to the section number in 411.a.

Figure 410-1. Tabular summary of credit for regulatory flood elevation credit (RFE)

Example 411.a-1. (See Figure 410-2.) Floodville has a recurring flood problem from a small ditch that was not mapped as SFHA on its FIRM. The City paid a consulting firm to prepare a new detailed study for this ditch as part of a plan to reduce flooding in this area. The study showed a floodplain one to two blocks wide in an area delineated as Zone C in the FIRM.

The City adopted this area as a regulatory floodplain, and its floodplain management ordinance requires that new buildings be protected to the new regulatory flood elevation.

This area is designated as AFD1 on the Impact Adjustment Map. Because the area is not in the SFHA and because a relatively long reach of the stream was studied to produce base flood elevations, RFE1 = 150.

Floodville also has an unnumbered A Zone mapped for Deadman's Run. Because this area has few buildings in it and because there is no development expected, the City decided not to finance a detailed study. Instead, its floodplain management ordinance requires that an applicant for a development permit in the Deadman's Run A Zone determine a base flood elevation for the proposed development site. The applicant's calculations are reviewed by the City Engineer for consistency with other elevations that have been calculated for the stream.

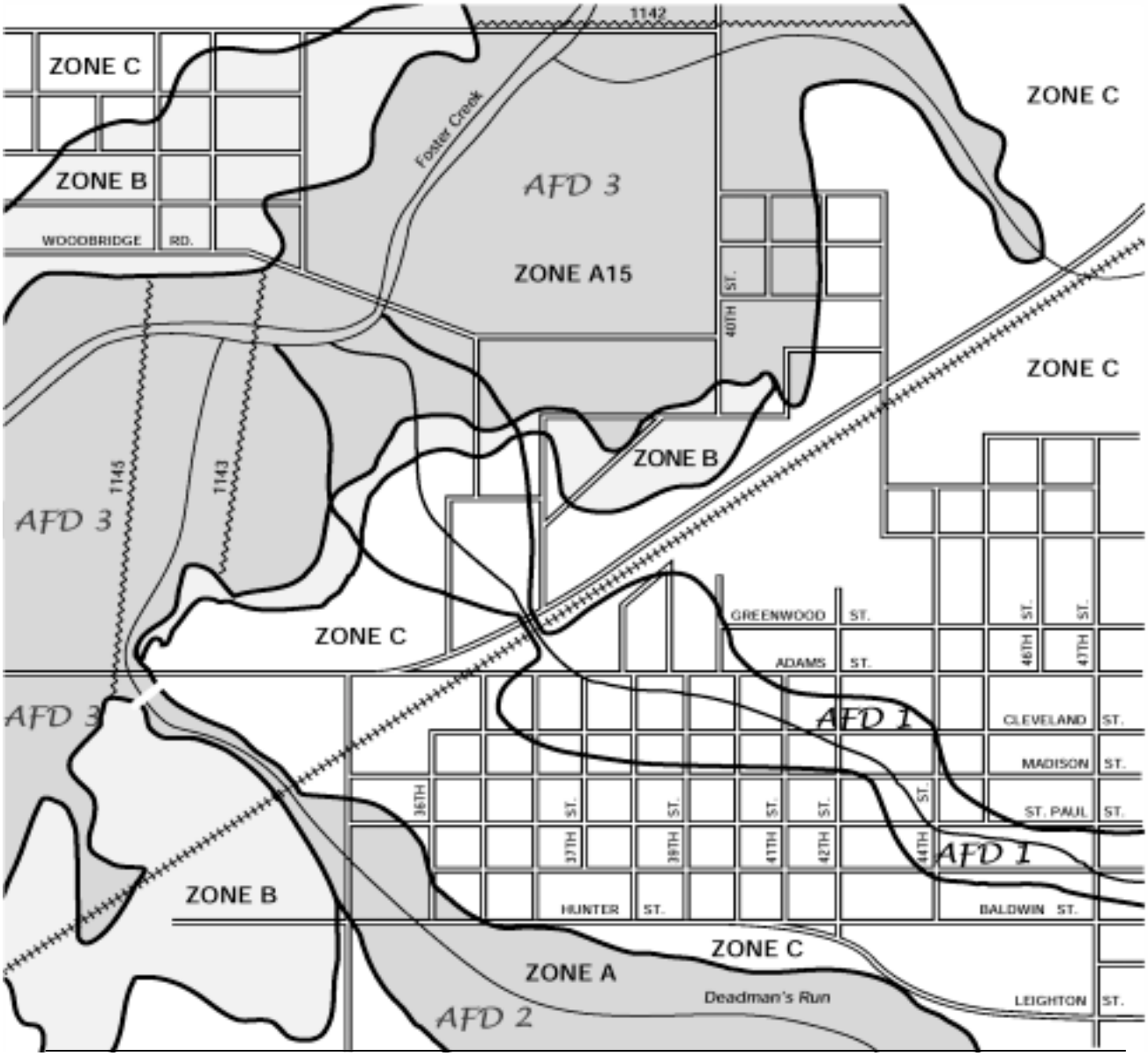
This area is designated AFD2 on the Impact Adjustment Map. Because the area is not in an SFHA that had base flood elevations provided by FEMA and because the new elevations are provided only for the developer's site, RFE2 = 75.

Example 411.a-2. Watertown's Engineering Department conducts a site-specific analysis for any development within 100 feet of any open channel with a drainage area larger than 40 acres. In order to calculate the impact adjustment, the area affected must be drawn on the Impact Adjustment Map. The community locates all open channels that drain 40 acres or more and designates them as "AFD1" on its Impact Adjustment Map (see Figure 410-3). [RFE1 = 100]

Because the Riley River map was prepared as part of the FEMA-funded Flood Insurance Study, that area does not qualify for RFE credit.

No RFE credit is provided for studies that result in base flood elevations lower than those shown on a Flood Insurance Rate Map. The NFIP rating system already credits lower base flood elevations through the map revision process.

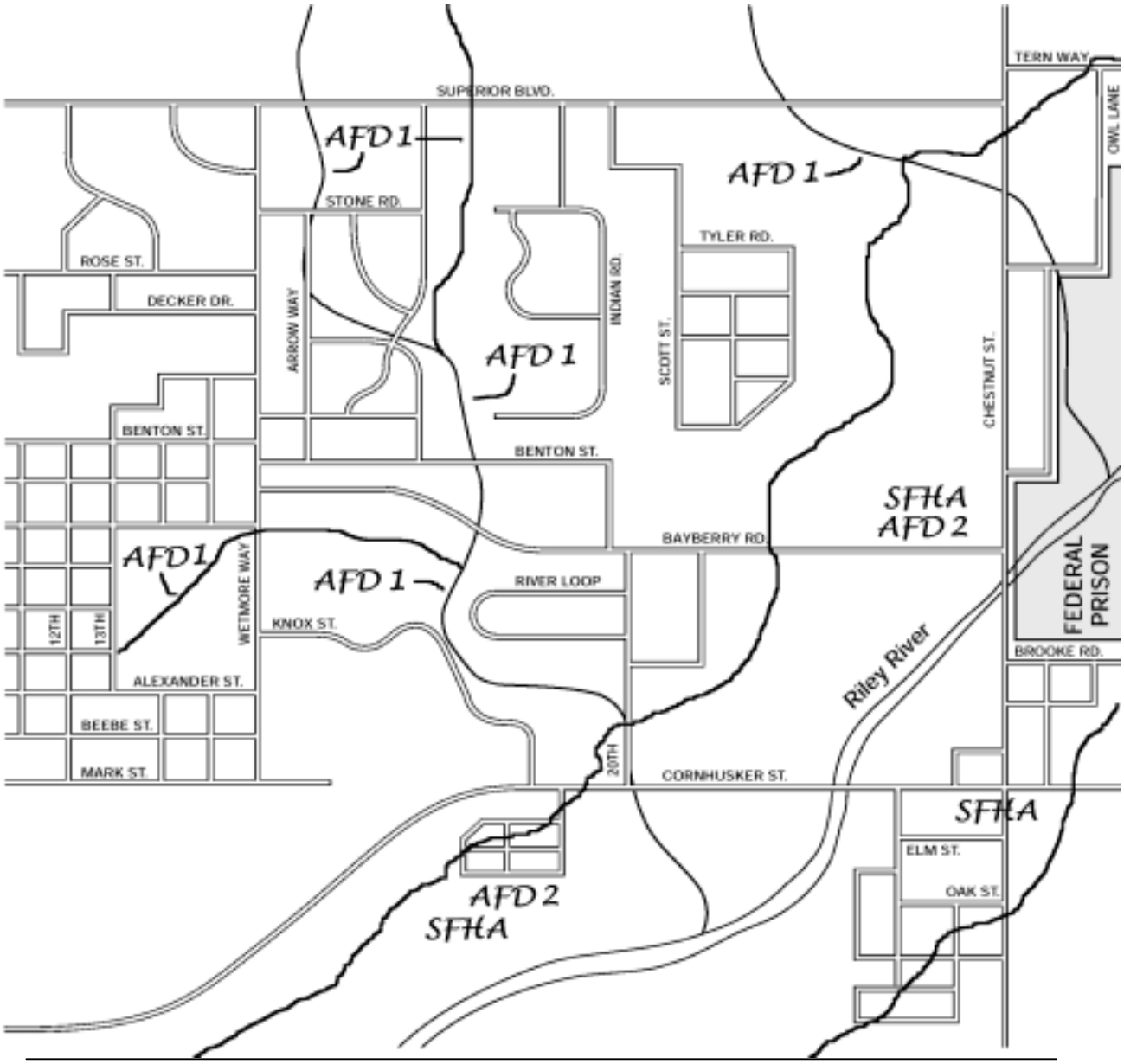
If an area has been studied in detail and is shown as a numbered A or V Zone or AE or VE Zone on the FIRM, then the only way to receive Community Rating System (CRS) credit for a new study is if the base flood elevation is raised. If it is lowered, the map revision will mean a reduction in the size of 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.



Impact Adjustment Map

Area	Size (acres)	Notes
aAFD1	71	Newly mapped problem ditch (C Zone)
aAFD2	58	Deadman's Run floodplain (A Zone)
aAFD3	267	Foster Creek floodplain (A15 Zone)
aSFHA	325	Deadman's Run and Foster Creek floodplains

Figure 410-2. Floodville's additional flood data.



Impact Adjustment Map

Area	Size (sq. miles)	Notes
SFHA	0.43	Does not include federal prison
aAFD1	0.09	Non-SFHA channels that drain > 40 acres
aAFD2	0.43	Riley River floodplain (same as SFHA)

Figure 410-3. Watertown's additional flood data.

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, or X Zones. The points for RFE2 will be higher than for RFE1.

b. Additional data standards for the new study (ADS) (Maximum credit: 165 points)

ADS = the sum of the following:

1. 75, if the study is based on future conditions hydrology. If the study provides new base flood elevations in an AE, VE, or A or V numbered zone, it must use the same technique as the existing study or the technique must be approved by FEMA.

2. 75, if the study includes a floodway.

3. 75, if the study delineates a coastal velocity zone.

4. 15, if the study was reviewed and accepted by an approved state review process.

The credit for ADS is the sum of the items that are included with the regulatory flood elevation (RFE), if any. A community may receive credit for ADS in areas where it does not receive credit for RFE. For example, the FIRM may have provided base flood elevations but FEMA's flood insurance study may not have included a Flood Boundary and Floodway Map. If the community later adopts a regulatory floodway, then ADS = 75 even though RFE = 0.

The maximum score is 165 because the second and third items are mutually exclusive.

There is no credit if items 2 and 3 were provided with the FIRM. Credit is provided if the FIRM (or a later map adopted for regulatory purposes) was based on future conditions hydrology or was reviewed and accepted by an approved state review process, provided the community's floodplain development regulations use the future conditions base flood elevations.

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 ADS credit after 2005.

Credit is given for state review to encourage additional examination of a study and closer coordination with other study programs. To qualify for this credit, FEMA must have designated, in writing, that the state's review program is acceptable for the purposes of the CRS. Instructions have been made available to State NFIP Coordinators to assist them in receiving CRS accreditation for their review programs.

A community must contact its ISO/CRS Specialist to find out if its state has a review program approved for CRS credit (see Section 414.c). The State NFIP Coordinator can document that a community's study was reviewed by the state.

NOTE: *The existence of an approved state review program does not mean the community will automatically receive this credit for ADS. There may be studies conducted before the state's program began and there may be some types of studies that the state does not review. Each profile or study credited under Section 411.b.4 must have been reviewed and approved by the state review program. For credit if elevations are provided for a single site at the time of development, the study* TECHNIQUE *must have been reviewed and approved. See Section 414.c.*

Example 411.b-1. Because Floodville expects that much 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) (75 points). It also included a floodway (75 points). [ADS1 = 75 + 75 = 150]

The City's floodplain management ordinance requires developers on Deadman's Run (AFD2) to use future-conditions hydrology (75 points). The ordinance does not require permit applicants to delineate a floodway. [ADS2 = 75]

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

FWS credit is based on the allowable floodway surcharge used in the study. 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.

If the study's floodway was based on the FEMA surcharge standard of 1.0 foot, then there is no credit for this element. If a community uses some other standard (such as a limitation on velocity or

a change in velocity) to determine more restrictive floodways, it must determine the actual reduction in floodway surcharge from the floodways 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 it to be prepared to a higher standard than that specified in *Flood Insurance Study Guidelines and Specifications for Study Contractors*, 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.*

Example 411.c-2. (See Figure 410-3.) 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 0.10-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.

d. Non-FEMA share (NFS) (Maximum credit: 200 points)

NFS credit is based on the percentage of the cost of the original flood insurance study or subsequent FEMA-funded restudies paid for by an agency other than FEMA.

NFS = EITHER

1. $\frac{\text{Non-FEMA share of the study cost}}{\text{Total cost of the study}} \times$ equivalent RFE credit for the study OR

2. 25, whichever is larger.

If a study was fully funded by an agency or developer other than FEMA, then the credit is reflected in the points for RFE under Section 411.a. A FEMA-funded Flood Insurance Study or restudy is not eligible for RFE credit. Figure 410-4 shows where studies funded by FEMA, not funded by FEMA, and partially funded by FEMA are credited.

This element credits instances in which a non-FEMA agency contributed to a FEMA Flood Insurance Study or restudy. The credit is the non-FEMA share of the cost of the study divided by the total cost of the study times the equivalent RFE credit for the study. If the community cannot determine the relative study costs, it may opt for the default credit of 25 points.

Element	**FEMA Study 100% FEMA $**	**Non-FEMA Study 100% Non-FEMA $**	**FEMA Study Partially Non-FEMA $**
RFE		Credit	
ADS: hydrology	Credit	Credit	Credit
ADS: floodway		Credit	Credit, if non-FEMA $ paid for part of floodway study
ADS: V Zone		Credit	Credit, if non-FEMA $ paid for part of V Zone analysis
ADS: State review	Credit	Credit	Credit
FWS	Credit	Credit	Credit
NFS			Credit

Figure 410-4. How the funding source affects credit.

Flood Insurance Studies or restudies cost shared with a state agency, the U.S. Army Corps of Engineers, the Tennessee Valley Authority, the Soil Conservation Service, or other federal agency are credited PROVIDED 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 NFS 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 NFS = 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.d-1. Floodville paid for the full cost of the problem ditch study (AFD1), so the credit is reflected in RFE and ADS. Similarly, applicants for development permits on Deadman's Run pay the full cost of the site-specific analyses required by the city's ordinance (AFD2). The detailed study of Foster Creek was fully funded by FEMA as part of the Floodville Flood Insurance Study, so there is no credit for non-FEMA share in AFD3. In all three cases, NFS = 0.

Example 411.d-2. Watertown pays the full cost of the site-specific analyses on AFD1, so NFS1 = 0.

The City cost-shared on the Flood Insurance Study for Riley River (AFD2). It contributed detailed base maps with 1-foot contour intervals. The maps cost $100,000 to produce. The total cost of the Flood Insurance Study, including the cost of the maps, was $400,000.

The study included a profile of the River and, since it was part of a Flood Insurance Study, it was submitted to FEMA to be used for preparing a FIRM. This would receive the RFE equivalent of 140 points under Section 411.a.1(c).

$$NFS2 = \frac{100{,}000}{400{,}000} \times 140 = 0.25 \times 140 = 35$$

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 each of the 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 "*CRS Credit for*" publications that are listed in the special hazards section of Appendix E. 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: 143 points)

(1) CTP1 = the total of the following

10, if the community is a Cooperating Technical Partner. The community must have signed a CTP agreement with FEMA.

10, if the community is in a regional agency OR state that has signed a CTP agreement with FEMA. This credit is provided only for CTP 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 (CTPs) 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.

CTPs 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 help maintain consistent national standards.

Each CTP enters into an agreement with FEMA, specifying what mapping activities it will implement. These could 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 CTP 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 CTP program or if it was prepared before the community, regional agency, or state signed the CTP 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 CTP 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 CTP agreement, then the score is multiplied by 1.0 and does not change.

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 = 0.10. 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 0.1 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.

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 $\sum rAFDi = 2.0$.

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 410-2 and 410-3).

$\Sigma rAFDi$ stands for the sum of all of the impact adjustment ratios for AFD (i.e., rAFD1 + rAFD2 + rAFD3 + . . .). The sum of all rAFDi cannot be greater than 2.0. 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 2.0.

NOTE: *All areas marked AFDi must be mutually exclusive. If the community does not regulate outside of the SFHA, then $\Sigma rAFDi$ 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 410-2. 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 aAFD2 = 58 aAFD3 = 267

aSFHA = 58 + 267 = 325

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

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

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

$\Sigma rAFDi = 0.22 + 0.18 + 0.82 = 1.22$, so $\Sigma rAFDi \leq 2.0$.

Note that on Figure 410-2, 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 410-3.) Watertown's Impact Adjustment Map shows the areas outside the SFHA where site-specific analysis is 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 x 2 = 200.

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

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

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

$\Sigma rAFDi = 0.21 + 1.0 = 1.21$, so $\Sigma rAFDi \leq 2.0$.

413 Credit Calculation

a. AFDi = (RFEi + ADSi + FWSi + NFSi) x rAFDi x CTP2i

b. c410 = ΣAFDi + (AFDSHi x CTP2i) + CTP1

Example 413.b-1. In Floodville (see Figure 410-2):

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

   RFE1 = 150 ADS1 = 150 FWS1 = 100 NFS1 = 0 rAFD1 = 0.22

   This study was done before Floodville signed the CTP agreement.
   CTP2 = 1.0.

   AFD1 = (150 + 150 + 100 + 0) x 0.22 x 1.0 = 400 x 0.22 x 1.0 = 88.0

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

   RFE2 = 75 ADS2 = 75 FWS2 = 0 NFS2 = 0 rAFD2 = 0.18

   This requirement was added to Floodville's ordinance pursuant to the CTP agreement.
   CTP2 = 1.1.

   AFD2 = (75 + 75 + 0 + 0) x 0.18 x 1.1 = 150 x 0.18 x 1.1 = 29.7

3. AFD3 = the more restrictive floodway prepared for Foster Creek.

   RFE3 = 0 ADS3 = 0 FWS3 = 100 NFS3 = 0 rAFD3 = 0.82

   This study was done after the state signed the CTP agreement. In that agreement, the State committed that all flood studies it funded would use the more restrictive floodway standard. CTP2 = 1.1.

   AFD3 = (0 + 0 + 100 + 0) x 0.82 x 1.1 = (100) x 0.82 x 1.1 = 90.2

4. Floodville has signed its own CTP agreement with FEMA and is in a state that is a qualifying CTP partner. CTP1 = 10 + 10 = 20

5. c410 = AFD1 + AFD2 + AFD3 + CTP1 = 88.0 + 29.7 + 90.2 + 20 = 227.9

Example 413.b-2. Watertown has two areas with additional flood data as shown on its Impact Adjustment Map in Figure 410-3.

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

   RFE1 = 100 ADS1 = 0 FWS1 = 150 NFS1 = 0 rAFD1 = 0.21

   AFD1 = (100 + 0 + 150 + 0) x 0.21 = (250) x 0.21 = 52.5

2. AFD2 = the Riley River floodplain covered by the original flood insurance study. Watertown receives credit for the state's higher floodway standard (FWS) and for sharing the cost of preparing the Flood Insurance Study (NFS).

   RFE2 = 0 ADS2 = 0 FWS2 = 150 NFS2 = 25 rAFD2 = 1.0

   AFD2 = (0 + 0 + 150 + 25) x 1.0 = (175) x 1.0 = 175

3. c410 = ΣAFDi = AFD1 + AFD2 = 52.5 + 175 = 227.5 = 228

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, 1988, is adopted and included in the area of jurisdiction of this ordinance.

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.

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. 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.

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.

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 *Flood Insurance Study Guidelines and Specifications for Study Contractors*.

NOTE: *If an area for which base flood elevations were provided with the FIRM is restudied, this activity will only credit the study if it raises the base flood elevation. If the study lowers the base flood elevation, the study should be submitted to FEMA for a map revision.*

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 methodologies 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 on pages 4-3 and 5-2, respectively, in *Flood Insurance Study Guidelines and Specifications for Study Contractors,* FEMA-37, 1999.

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 *Flood Insurance Study Guidelines and Specifications for Study Contractors*.

c. [If the community requested credit for state review under Section 411.b.4] Documentation that the state reviewed and accepted the study or analysis techniques for which credit is being requested.

Documentation will usually be a letter from the responsible state agency, stating that the review was done and/or that the data are approved for regulatory purposes.

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.d] 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 10% 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 CTP agreement.

415 For More Information

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

CRS Credit for Management of Areas Subject to Uncertain Flow Path Hazards

CRS Credit for Management of Areas Adjacent to Closed Basin Lake Hazards

CRS Credit for Management of Ice Jam Hazards

CRS Credit for Management of Floodprone Areas Subject to Land Subsidence Hazards

CRS Credit for Protecting Coastal Dunes and Beaches

CRS Credit for Management of Mudflow Hazards

CRS Credit for Management of Coastal Erosion Hazards

CRS Credit for Management of Tsunami Hazards

b. 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

Flood Insurance Study Guidelines and Specifications for Study Contractors, FEMA-37, 1999. (Also available from FEMA's website at http://www.fema.gov/mit/tsd/dl_scg.htm.)

Use of Flood Insurance Study (FIS) Data as Available Data, FEMA Floodplain Management Bulletin 1-98, 1998.

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/library/lib06.htm.)

c. 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.

d. 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.

e. Communities may check on past FIRMs with the FEMA Map Coordination Contractors.

Check the following website: http://www.floodmaps.net/mit/tsd/ST_order.htm or

Regions I–IV
Flood Insurance Study Information Specialist
2977 Prosperity Avenue
Fairfax, VA 22031
Fax: (703) 876-0073
Map.Specialist@dewberry.com

Regions V–VII
Flood Insurance Study Information Specialist
12101 Indian Creek Court
Beltsville, MD 20705
Fax: (301) 210-5435
mapspecialist@pbsj.com

Regions VIII–X
Flood Insurance Study Information Specialist
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304
Fax: (703) 329-3023
bakermail@mbakercorp.com

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*. http://www.fema.gov/mit/tsd/dl_comp.htm.

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420 OPEN SPACE PRESERVATION

Summary of Activity 420

421 Credit Points. There are four elements in this activity for a maximum of 900 points (excluding special hazards credit).

a. Preserved open space (OS): Up to 725 points are provided for keeping vacant floodplain lands open. This can be done by keeping the land publicly owned (e.g., a park or golf course), by keeping it as a private preserve (e.g., hunting club lands), or by regulating development so that there will be no new buildings or filling on the land.

b. Deed restrictions (DR): Up to 75 points are provided if the deeds for the parcels preserved as OS have restrictions that prevent future owners from developing them.

c. Natural and beneficial functions (NB): Up to 100 points are provided if the parcels preserved as OS are in an undeveloped natural state, have been restored to a natural state, or protect natural and beneficial floodplain functions.

d. Special hazard areas preserved as open space (SHOS): Up to 375 points are provided if the open space is also in an area subject to one of the special flood-related hazards listed in Section 401.

422 Impact Adjustment. The credit points for each element are adjusted in one of three ways.

a. Under Option 1, where the entire regulatory floodplain is affected, the impact adjustment ratio for an element is 1.0.

b. Under Option 2, where at least 5 acres of regulatory floodplain are affected, the impact adjustment ratio for an element is 0.05 for OS and 0.1 for DR and NB.

c. Under Option 3, the impact adjustment ratios reflect the proportion of the regulatory floodplain affected by an element.

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

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

a. [Required only if credit for OS is based on a prohibitory regulation] A copy of the regulatory language.

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

b. Documentation showing the development restriction for each parcel to be credited under OS. If Option 2 was used, then documentation is only needed for 5 acres.

c. Documentation showing the deed restriction for each parcel to be credited under DR. If Option 2 was used, then documentation is only needed for 5 acres.

d. Documentation, signed by a professional in a natural science, that parcels credited under NB have been preserved in or restored to an undeveloped natural state. If Option 2 was used, then documentation is only needed for 5 acres.

e. [Required only if Option 3 was used] The Impact Adjustment Map.

f. [Required only if credit is requested for areas outside the Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM)] Documentation showing that floodplain regulations are in effect in those areas.

425 For More Information. Additional credit for open space in special hazard areas is discussed in the commentary supplement for each special hazard.

420 OPEN SPACE PRESERVATION

Credit is provided for having floodprone property that is preserved as publicly owned or controlled open space.

Background: One of the best ways to prevent flood damage is to keep floodprone areas free from development. Preserving open space is therefore recognized as a regulatory activity. In addition to the flood protection benefits, preserving open space can greatly enhance the natural and beneficial functions that floodplains serve.

Activity Description: Credit is given for areas that are permanently preserved as open space. Additional credit is given for parcels of open space that are protected by deed restrictions or that have been preserved in or restored to their natural state. Open space credit is doubled within areas of special hazards.

Under this activity, several different methods of preserving floodplain lands as open space (OS) are recognized. To be termed "open space," the land must be free from buildings, filling, or other encroachment to flood flows. There may be pavement, such as parking lots and roads in a park, but the objective is to prevent or minimize development that either obstructs floodwaters or exposes insurable buildings to damage. This activity recognizes programs that have preserved wetlands, beaches, and other critical areas from development, even though they may not have been intended as floodplain regulatory activities.

If an open space parcel has a deed restriction or other permanent legal attachment that prohibits buildings or fill from ever being placed on the land, it is given the designation "DR" and additional credit. If it has been preserved in or restored to its natural state, it is designated "NB" and given additional credit.

Additional credit is provided for preserving open space in areas subject to one of the hazards discussed in the separate CRS publications on special hazards.

The Community Rating System (CRS) encourages communities to devote special attention to areas affected by any of the special flood-related hazards listed in Section 401. Communities affected by one or more of these hazards should obtain a copy of the separate CRS publication on that special hazard (see Appendix E). That publication shows how to increase credit points for areas that are designated open space in this activity if they are also affected by one of these special hazards.

421 Credit Points

Maximum credit for Activity: 900 points (excluding special hazards credit).

a. Preserved open space (OS) (Maximum credit: 725 points)

OS = 725, for that portion of the regulatory floodplain which is preserved as open space. To qualify for credit, there must be an assurance that the property will remain open, that is, without buildings, fill, obstruction to flood flows, or loss of floodplain storage.

This requirement may be met in one of three ways:

1. Public land such as state and local parks and easements: However, as noted in Section 403, there is no open space credit for federal lands. All portions of city and county parks, forest preserves, state parks and state forests, publicly owned beaches, or natural areas that are within the regulatory floodplain may be counted for open space credit. Separate parcels owned by a school district or other public agency can be counted, provided there are no buildings on them within the regulatory floodplain. See Section 301 for the definition of "buildings."

Example 421.a-1. Floodville has three publicly owned open space areas that qualify. They are marked "OS" on the Impact Adjustment Map in Figure 420-1. Foster Creek Park is a nature preserve along Foster Creek. It is 90 acres, with 10 acres in the B Zone and 80 acres in the SFHA. The Hunter Street School has a 6-acre playing field in the Deadman's Run floodplain. The City's Adams Street Park is 1.5 acres. All of it is in the newly mapped floodplain for the unnamed ditch.

2. Preserve land: private wildlife or nature preserves that are maintained for open space purposes. Examples would be church retreats, hunting club lands, Audubon Society preserves, and similar privately owned areas that are set aside and not intended to be developed. A parcel set aside by a developer as a temporary "preserve" until the area develops is not considered permanent open space.

Impact Adjustment Map

Area	Size (acres)	Notes
OS	80.0	Foster Creek Park (floodplain portion)
OS, DR	6.0	Hunter Street School playing field
OS	1.5	Adams Street Park
aOS	87.5	All open space areas
aNB	50.0	Bottomland hardwoods in Foster Creek Park

Figure 420-1. Floodville's open space.

3. Restrictive development regulations: privately owned lands subject to state or local regulations that prevent construction of buildings or the placement of fill or other obstructions. Credit is only given for such regulated lands that are vacant at the time of application for CRS credit. Some examples are coastal construction setback lines, wetlands or natural areas regulations, or any state or local law that prohibits new buildings from a defined area. The regulations must also prohibit fill, grading, or other obstructions to flood flows in areas subject to riverine flooding.

A wetlands regulation that is dependent upon site analysis to define whether a property is a wetland is not acceptable. The area where buildings are prohibited must be mapped or defined by lots or a legal description so it can be mapped. The Coastal Barrier Resources Act is not acceptable because it does not prevent construction of buildings, it only denies federal support for new development.

Ordinance language prohibiting structures that may cause obstructions in the floodway is not granted CRS credit because such a prohibition is a National Flood Insurance Program (NFIP) requirement. It allows a building in the floodway if the applicant can show that it causes no obstruction.

If an ordinance prohibits residential development of a floodplain, the community may request OS credit for all floodplain areas that are zoned for residential use only.

Open space subdivision design, cluster development, transfers of development rights, and planned unit developments are regulatory approaches that can require or encourage developers to set aside floodplains and other areas as dedicated open space. The areas may be deeded to the community or permanently protected under a conservation easement and maintained by the owner or a homeowners association.

Unless the local regulations specifically identify certain undeveloped floodplains and mandate that they be set aside, there is no automatic OS credit for these regulations because there is no assurance that the developer will set aside specific areas. However, once a plat has been accepted and the open space is deeded over or otherwise preserved, the sites can be credited as public or preserved open space. More information on these regulatory techniques can be found in *Subdivision Design in Flood Hazard Areas.*

NOTE: *the CRS does not call for prohibiting all use of private property. Communities are advised to have their attorneys or corporation counsels ensure that their regulations preventing construction of buildings or the placement of fill in hazardous areas do not constitute a taking of private property.*

Five types of properties are not counted for this activity. These include:

1. Properties not counted in any calculations for the 400 series.
2. Areas with buildings on them. Insurable buildings on parcels larger than 10 acres will not disqualify a lot, provided the building is “a necessary appurtenance” of the open space use.
3. Street, parkway, railroad, levee, and canal rights of way. Also, ditch and channel rights of way less than 100 feet wide unless they are the principal drainage feature in the area. These areas are not deleted if they are an integral part of a larger open space area.
4. Parcels where filling or other encroachments may be placed.
5. Publicly owned property that is not intended for open space use, such as a vacant lot in an industrial park.

The five types of properties that are not counted are discussed in more detail below.

1. Properties not counted in any calculations: As noted in Section 403, certain areas are not considered part of the regulatory floodplain, and these areas are not counted toward either open space or aRF:

   a. Open water larger than 10 acres, such as lakes, bays, and large rivers;

   b. Lands larger than 10 acres that are either owned by the federal government, such as military installations and national parks, or where development is prohibited by the federal government; and

   c. At the community’s option, areas beyond the community’s regulatory jurisdiction.

   d. A99 and AR Zones.

   See Section 403 for a discussion of excluding these areas from the Impact Adjustment Map.

2. Areas with buildings on them: See Section 301 for a discussion of “buildings.” Insurable buildings on parcels larger than 10 acres will not disqualify a lot, provided the building is “a necessary appurtenance” of the open space use.

Example 421.a-2.

1. If a large city park has a swimming pool, the park can be counted even though it may have a building with restrooms, lockers, and clothes-changing areas.

2. A 12-acre park that includes the first settler's home or other historical building that is an integral part of the park can be considered OS.

3. A ranger's cabin will not disqualify a state forest for OS credit.

4. Floodville's Foster Creek Park can be credited even though it has a nature center because the park is larger than 10 acres.

5. A strip of single-family lots along a stream has a house in the floodplain fringe of each lot. There are no buildings in the floodway, and the community's regulations prohibit filling and the placement of new buildings in the floodway. The open space area, the floodway, is currently vacant and the regulations will keep it vacant.

6. Floodville's Hunter Street School playing field can be credited. None of the structures on it, like the bleachers and fencing, are "buildings" as defined in Section 301.

3. Street, parkway, railroad, levee, and canal rights of way: Also, ditch and channel rights of way less than 100 feet wide unless they are the principal drainage feature in the area. These areas are not deleted if they are an integral part of a larger open space area.

   Such narrow, linear strips of utility easements or publicly owned property are excluded from consideration as open space because they are necessary for any type of development or use of an area. On the other hand, parks that parallel a river or shoreline that are at least as deep as the normal lots in the area may be counted as open space.

   A 50-foot drainage easement running between developed or developable areas in a coastal or large riverine floodplain is not granted OS credit. Streets in a park designated OS are included in the area; a street between a park and a developed area is not counted.

4. Parcels where filling or other encroachments may be placed: For example, an open area used for temporary storage of rock or construction materials does not qualify as open space. Plowing and other alterations of the ground are not counted as filling provided they do not create obstructions to the flow or loss of storage of floodwaters.

   The objective of preserving open space is to prevent increased flood damage from future development. Even though insurable buildings may not be allowed, filling, dumping, or storage on a lot can aggravate flood problems on other properties.

5. Publicly owned property that is not intended for open space use, such as a vacant lot in an industrial park: One of the keys to the open space credit is the fact that the area will remain open space, not just that it is owned by a public agency. Therefore, areas set aside by a

developer or a public agency only until future economic or other conditions allow it to be developed, are excluded.

b. Deed restrictions (DR) (Maximum credit: 75 points)

DR = 75, for those parcels of the community's open space which have deed restrictions. Only areas that qualify for OS credit can be considered for DR credit.

Just because a lot is a city park today, there is usually no legal restriction that keeps a city council from building on it or selling it for development. The exact language for a legal arrangement or deed restriction will vary from state to state and should be prepared by a local attorney. It should include the following factors:

- No new buildings may be allowed on the property,
- The restriction runs with the land, and
- The restriction cannot be changed by a future owner; rather, it can only be amended by a court for just cause.

A community, other agency, or organization may attach such a restriction to its existing parks and other public open areas in order to receive the deed restriction credit.

Example 421.b-1. Property often is donated for park purposes with the stipulation that it be used only for public recreation. Properties purchased under the Federal Emergency Management Agency's (FEMA's) Hazard Mitigation Grant Program program qualify for this credit because the titles have a deed restriction that prohibits buildings.

Example 421.b-2. The Hunter Street School playing field in Floodville was purchased with financial assistance from a state agency. The agency required a deed restriction that limits future use of the site to recreation or education. Because the site was in the floodplain, the deed restriction also prohibits construction of any buildings. On Floodville's Impact Adjustment Map (Figure 420-1), the CRS Coordinator designated this site with "DR" as well as "OS" to show that it is open space subject to a deed restriction.

c. Natural and beneficial functions (NB) (Maximum credit: 100 points)

NB = 100, for those parcels of the community's floodplain open space which are in an undeveloped natural state, have been restored to a natural state, or protect natural and beneficial floodplain functions. Credit is available for NB only in areas that qualify for OS credit. The area must be located in the community's floodplain and must be preserved in its natural state either by commitment of the owners or through development regulations.

The following types of open space can receive NB credit.

1. Areas in their undeveloped natural state (i.e., areas that have not been built on, graded, or farmed).

2. Areas that have been farmed or otherwise developed but have been restored to a state approximating their natural, pre-development conditions.

3. Areas designated as worthy of preservation for their natural or beneficial functions by a federal, state, or nationally recognized private program. Such programs include, but are not limited to:

   - The U.S. Fish and Wildlife Service's Threatened and Endangered Species' Critical Habitat Designations,

   - A Habitat Conservation Plan approved by the U.S. Fish & Wildlife Service or the National Marine Fisheries Service. (The Habitat Conservation Plan can also support credit under Sections 431.g and 511.b),

   - State sensitive-areas programs that place development restrictions on designated properties, and

   - The Nature Conservancy's Heritage Program Inventory.

   NB credit is only provided for open space land designated for some natural and beneficial floodplain function as defined in Section 130, Glossary. Areas designated only as "scenic," as historically significant, or as outstanding canoeing or boating streams would not qualify for this credit.

To qualify for NB credit, the property must meet all the criteria for OS. For example, a forest preserve with a building on it could still be credited if the building is a nature center or a restroom that is a "necessary appurtenance of the open space use."

Although any open space area may qualify for OS, to qualify as NB the area must not only be in a natural state but it must also be preserved in such a state. This must be documented with a letter from a professional in a natural science such as botany or biology, or a staff member of an environmental

or conservation agency or organization. For example, a state forest may qualify for OS but would not qualify for NB if clear cutting is allowed. Similarly, a recreational beach with cabanas, changing facilities, temporary concession stands, etc., may qualify as OS but would not meet the credit criteria for NB credit.

If a property is also protected by a deed restriction, DR credit can be provided. A property may be marked on the Impact Adjustment Map for credit under all three elements. In such cases, the credit points for all three elements, OS, DR, and NB, are cumulative (i.e., worth 725 + 75 + 100 = 900 points before the impact adjustment).

Example 421.c-2. When it prepared its comprehensive plan, Floodville recognized the value of preserving the bottomland hardwoods in the floodplain of Foster Creek. A joint public and private venture acquired bottomland areas adjacent to the city's park. The park was expanded and nature trails and an interpretive center were established in the newly acquired area.

The floodplain portion of the park is designated "OS" on the Impact Adjustment Map (Figure 420-1). Within the area designated OS, those bottomlands still in a natural state are marked with a dashed line and designated "NB."

The entire park is 90 acres; the floodplain area designated as OS covers 80 acres. Some of the park includes ball fields, parking lots, picnic pavilions, and other areas that do not qualify for NB credit. The area that qualifies for NB is 50 acres.

d. Special hazard areas preserved as open space (SHOS) (Credit points vary)

Credit for preserving areas subject to special flood-related hazards is described in the separate CRS publications on special hazards. The credit points, cSHOS, are then transferred to this activity.

422 Impact Adjustment

a. Option 1:

1. rOS: If all of the area of the regulatory floodplain is preserved as open space, rOS = 1.0.

2. rDR: If all of the regulatory floodplain is open space and has deed restrictions, rDR = 1.0.

3. rNB: If all of the regulatory floodplain is open space that also qualifies for NB credit, rNB = 1.0.

Option 1 can be used only if ALL of the area in the community's regulated floodplain is currently undeveloped and is preserved as open space.

b. Option 2:

1. rOS: If at least 5 acres of regulatory floodplain are preserved as open space, the community may use the default value for the impact adjustment ratio rOS = 0.05.
2. rDR: If at least 5 acres of regulatory floodplain qualify for OS and DR credit, the community may use the default value for the impact adjustment ratio rDR = 0.10.
3. rNB: If at least 5 acres of regulatory floodplain qualify for OS and NB credit, the community may use the default value for the impact adjustment ratio rNB = 0.10.

Example 422.a-1. Singleton has one 7-acre park in its regulatory floodplain. Rather than prepare an impact adjustment map, Singleton decides to use Option 2 and rOS = 0.05.

c. Option 3:

1. rOS: The size of the area preserved as open space (aOS) must be determined in order to adjust the credit points to reflect its impact. This impact is the portion of open space in the total area of regulated floodplain in the community (aRF).

   $$rOS = \frac{aOS}{aRF}$$

2. rDR: The size of the area with deed restrictions (aDR) must be determined in order to adjust the credit points to reflect its impact. This impact is the portion of the area with deed restrictions within the total area of regulated floodplain in the community (aRF).

   $$rDR = \frac{aDR}{aRF}$$

3. rNB: The size of the area preserved for natural and beneficial functions (aNB) must be determined in order to adjust the credit points to reflect its impact. This impact is the portion of the area preserved for its natural and beneficial floodplain functions within the total area of regulated floodplain in the community (aRF).

   $$rNB = \frac{aNB}{aRF}$$

See Section 403 for a discussion of the Impact Adjustment Map. In these formulae, the "a" variables are the sizes of the areas marked on the Impact Adjustment Map. aOS is the size of all of the areas

marked "OS." It is divided by the value for aRF that was calculated according to the instructions in Section 404.

Example 422.c-2. As shown in Figure 420-1, Floodville has three areas that qualify for OS: Foster Creek Park (80 acres in the SFHA), the Hunter Street School playing field (6 acres in the Deadman's Run floodplain) and the Adams Street Park (1.5 acres). The area of Floodville's regulatory floodplain (aRF) is the area of all three regulated floodplains: 396 acres.

Because the regulatory floodplain is not all in open space, Floodville cannot use Option 1. Option 2 is not used for OS because the City has calculated the areas affected and found that more than 5% of the regulatory floodplain is in open space. Therefore it uses Option 3:

aOS = 80 + 6 + 1.5 = 87.5 acres

$$rOS = \frac{aOS}{aRF} = \frac{87.5}{396} = 0.22$$

The only area affected by a deed restriction is the 6-acre playing field at Hunter Street School. Because this is less than 10% of the area of the regulatory floodplain, Floodville will receive more credit points by using Option 2: rDR = 0.10.

The area preserved in its natural state in Foster Creek Park is 50 acres. As with OS, Option 3 will produce the highest score for NB:

aNB = 50

$$rNB = \frac{aNB}{aRF} = \frac{50}{396} = 0.13$$

423 Credit Calculation

a. cOS = OS x rOS

b. cDR = DR x rDR

c. cNB = NB x rNB

d. cSHOS from Section 424SH

e. c420 = cOS + cDR + cNB + cSHOS

Section 424SH is part of a separate CRS publication on special hazards, necessary to apply for CRS credit for special hazard areas (see Appendix E).

Example 423-1. Floodville calculates its credit for Activity 420.

cOS = OS x rOS = 725 x 0.22 = 159.5

cDR = DR x rDR = 75 x 0.1 = 7.5

cNB = NB x rNB = 100 x 0.13 = 13

cSHOS = 75

The credit for SHOS is discussed in a separate publication on the appropriate special hazard.

c420 = cOS + cDR + cNB + cSHOS =

159.5 + 7.5 + 13 + 75 = 255.0 = 255

During the verification visit, the ISO/CRS Specialist notes that a significant portion of the 6-acre playing field at the Hunter Street School recently has been filled in preparation for development. Credit is not verified for this parcel. This reduces the area of verified open space from 87.5 acres to 81.5 acres, which reduces the impact adjustment factor rOS from 0.22 to 0.21. This reduces the credit for open space from 159.5 to 152.25. Since this was the only parcel eligible for credit for deed restrictions, cDR = 0. Floodville's verified credit for this activity is:

c420 = cOS + cDR + cNB + cSHOS =

152.25 + 0 + 13 + 75 = 240.25, which is rounded to 240.

424 Credit Documentation

The community must submit the following:

a. [Required if OS credit is requested for prohibitory ordinance language] The ordinance language that prohibits structures and fill in part or all of the floodplain. The acronym OS must be marked in the margin of the sections pertaining to this activity.

The ordinance must specifically prohibit both structures and fill in all or part of the floodplain to qualify for OS credit.

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

b. 1. [If the community determined rOS using Option 1 (422.a) or Option 3 (422.c)] Documentation showing the development restrictions for each parcel not owned by the community for which OS credit is applied. In the case of parks, golf courses or other recreation or preserve areas owned by the state or another public agency, a letter from the owning agency will suffice. In the case of privately owned land, a charter for the preserve land or other written statement that demonstrates that the owner will preserve the land as open space is needed.

2. [If the community determined rOS using Option 2 (422.b)] Documentation showing the development restrictions for at least 5 acres for which OS credit is applied.

c. 1. [If the community determined rDR using Option 1 (422.a) or Option 3 (422.c)] For parcels of open space for which deed restriction (DR) credit is requested, copies of the deed restrictions for each parcel.

2. [If the community determined rDR using Option 2 (422.b)] For parcels of open space for which deed restriction (DR) credit is requested, copies of the deed restrictions for at least 5 acres.

d. 1. [If the community determined rNB using Option 1 (422.a) or Option 3 (422.c)] For parcels of open space for which protection of natural and beneficial functions (NB) credit is requested, documentation signed by a professional that the parcels have been preserved in or restored to an undeveloped natural state.

2. [If the community determined rNB using Option 2 (422.b)] For parcels of open space for which protection of natural and beneficial functions (NB) credit is requested, documentation signed by a professional that at least 5 acres have been preserved in or restored to an undeveloped natural state.

NOTE: *DR and NB can only be marked in areas designated OS. There is no credit for DR or NB on lands that are not open space.*

Copies of the documentation should be readily available at the verification visit. The ISO/CRS Specialist will not be able to go to the courthouse to review property records. DR credit can only be documented with a copy of the actual deed restriction. An ordinance requiring deed restrictions or dedication of easements is not adequate documentation that there is a permanent legal restriction that prevents future owners from developing that property.

NB documentation may be a letter from a recognized conservation agency or organization, such as the state parks department or The Nature Conservancy, a page from a recognized natural areas inventory, or a letter from a professional in a natural science such as botany or biology.

> e. [If the community calculates impact adjustment ratios using Option 3 (422.3)] The Impact Adjustment Map prepared according to Section 403. Each area for which an impact adjustment ratio is calculated in Section 422.c must be designated on the Impact Adjustment Map and in the map key.

Preparation of the Impact Adjustment Map as described in Section 403 is required only if the community is calculating impact adjustment ratios based upon areas (see Section 402). The community's Impact Adjustment Map and its key must show the areas designated for credit under this activity. The map will be reviewed during the verification visit and there will be a visit to a sample of the sites to confirm that they are open.

> f. [If the community is applying for credit for open space outside the Special Flood Hazard Area (SFHA)] Documentation that shows that floodplain regulations are in effect in the area outside the SFHA.

If aRF is greater than aSFHA, i.e., if the community's regulatory floodplain includes areas outside the SFHA shown on the Flood Insurance Rate Map (FIRM), then the community must show that the areas outside the SFHA are subject to floodplain regulations. Often this documentation is supplied with the application for Activity 410 (Additional Flood Data). This documentation ensures that OS credit is provided only for parks that are actually in floodplains.

425 For More Information

a. See Appendix E to order the following free publications, which are necessary to apply for CRS credit for special hazard areas.

CRS Credit for Management of Areas subject to Uncertain Flow Path Hazards.

CRS Credit for Management of Areas Adjacent to Closed Basin Lake Hazards.

CRS Credit for Management of Ice Jam Hazards.

CRS Credit for Management of Floodprone Areas Subject to Land Subsidence Hazards.

CRS Credit for Protecting Coastal Dunes and Beaches.

CRS Credit for Management of Mudflow Hazards.

CRS Credit for Management of Coastal Erosion Hazards.

CRS Credit for Management of Tsunami Hazards.

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

c. 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

d. More information on planning and regulatory techniques to preserve floodplain open space can be found in *Subdivision Design in Flood Hazard Areas,* Planning Advisory Service Report # 473. Copies can be ordered for $32 ($16 for APA members) from

American Planning Association
122 South Michigan Ave, Suite 1600
Chicago, IL 60603
(312) 431-9100

430 HIGHER REGULATORY STANDARDS

Summary of Activity 430

431 Credit Points. There are 16 elements in this activity for a maximum of 2,720 points (excluding special hazards credit):

a. Freeboard (FRB): Up to 300 points for a freeboard requirement.

b. Foundation protection (FDN): Up to 35 points for engineered foundations.

c. Cumulative substantial improvements (CSI): Up to 110 points for counting improvements cumulatively.

d. Lower substantial improvements (LSI): Up to 90 points for a substantial improvement threshold lower than 50%.

e. Protection of critical facilities (PCF): Up to 100 points.

f. Protection of floodplain storage capacity (PSC): Up to 80 points.

g. Natural and beneficial functions regulations (NBR): Up to 40 points.

h. Enclosure limits (ENL): 300 points for prohibiting first floor enclosures.

i. Other higher standards (OHS): Up to 50 points for other regulations.

j. Land development criteria (LD). Up to 700 points, as calculated in Section 430LD.

k. Special hazards regulations (SH): Credit points vary for regulations keyed to special flood-related hazards.

l. State-mandated regulatory standards (SMS): Up to 45 points.

m. Building code (BC): Up to 120 points, based on the community's classification under the Building Code Effectiveness Grading Schedule and adoption of the International Code Series.

n. Staffing (STF): Up to 50 points, based on certification and training of the community's staff.

o. Manufactured home parks (MHP): Up to 50 points for certain anchoring and elevation requirements.

p. Coastal AE Zones (CAZ): Up to 650 points for construction standards in certain coastal zones.

432 Impact Adjustment. The credit points for each element are adjusted in one of three ways:

a. Under Option 1, if the standards apply throughout the regulatory floodplain, the impact adjustment ratio for an element is 1.0 minus the ratio for open space.

b. Under Option 2, if the standards do not apply throughout the regulatory floodplain, a default impact adjustment ratio of 0.25 may be used; for CAZ credit, the impact adjustment is 0.1

c. Under Option 3, the impact adjustment ratios may reflect the proportion of the regulatory floodplain affected by the element (excluding open space areas); the adjustment for PCF is based on the 500-year floodplain.

433 Credit Calculation. The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

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

a. The portion of the state or local law or ordinance that adopts the regulatory standard.

b. [If impact adjustment factors are based on Option 3 (432.c)] The Impact Adjustment Map.

c. An explanation of the community's enforcement procedures.

d. [If requesting credit for STF (431.n)] A copy of the certification of graduation or floodplain manager certification.

435 For More Information.

430 HIGHER REGULATORY STANDARDS

NOTE: *A separate publication,* ***CRS Credit for Higher Regulatory Standards****, 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 regulations that require that new development be provided more protection than that of the National Flood Insurance Program's (NFIP's) minimum requirements.

Background: Current NFIP riverine regulatory standards require that new residential buildings in the Special Flood Hazard Area (SFHA) have their lowest floor at or above the base flood elevation. Non-residential buildings may be floodproofed to the base flood elevation. NFIP coastal rules require that new buildings be above the base flood elevation and, in V (velocity) Zones, be built on engineered piles or columns. Existing buildings can be improved or reconstructed as long as the project does not exceed 50% of the building's value.

Although the NFIP minimum standards provide a great deal of flood protection, damage can still result for many reasons:

- Estimates of flood heights are subject to various errors, especially in areas without long-term flood and rainfall records;
- Buildings may be damaged by floods exceeding the predicted 100-year flood;
- Urbanization and other changes in the watershed can increase the flood hazard; and
- Filling and other development in the fringe can reduce storage capacity.

Activity Description: Under this activity, numerous approaches are credited. These include freeboard, foundation protection, more stringent building improvement rules, protection of critical facilities, preservation of floodplain storage, protecting the natural and beneficial functions of floodplains, limiting building enclosures below the flood level, mapping and regulating areas subject to special flood hazards, and low density zoning. Additional measures proposed by a community will be evaluated and scored accordingly.

Many standards have been adopted by communities across the nation to provide more protection to new development and redevelopment.

- Requiring lowest floors of residences to be higher than the base flood not only reduces damage if a larger flood occurs but also at least partially offsets uncertainties in the hydrologic and hydraulic computations of the base flood elevation;

- Protecting foundations reduces damage resulting from scour and settling;

- Maintaining floodplain storage by prohibiting fill or by requiring compensatory storage reduces downstream flood peaks;

- Requiring full compliance with floodplain management regulations when proposed improvements or repairs are less than 50% of a building's value brings more nonconforming buildings up to flood protection standards;

- Protecting critical facilities to higher levels reduces damage to those facilities and improves the community's ability to respond to the needs of citizens during a disaster;

- Identifying and regulating areas subject to special flood-related hazards reduces damage within those areas; and

- Zoning to maintain a low density of floodplain development reduces the damage potential within the floodplain and helps maintain storage capacity and conveyance capacity.

NOTE: *A community should not amend its ordinances solely to earn Community Rating System (CRS) credit points, nor should it necessarily adopt the examples used in the* ***CRS Coordinator's Manual.*** *Ordinance language should be carefully written to support the community's goals and the purposes of its regulatory program. All such language should be reviewed by the community's legal counsel before adoption.*

431 Credit Points

Maximum credit for Activity 430: 2,720 points (excluding special hazards credit).

a. Freeboard (FRB) (Maximum credit: 300 points)

FRB (Freeboard) credit is based on the required freeboard (FB) (in feet) in relation to the base flood elevation:

1. FRB = 100 x FB.
2. For FB of 3.0 feet or more, FRB = 300.
3. If the ordinance uses the encroached elevation, add 0.5 to FB.
4. For FRB credit, the 500-year flood elevation is considered to be 1 foot higher than the base flood elevation, unless the community demonstrates that it is higher. If freeboard is based upon the 500-year flood, add 1.0 to FB.

5. For FRB credit outside of V Zones, if the ordinance uses "lowest horizontal structural member" or similar language instead of "lowest floor," add 1.0 to FB.

6. A community may use the following to receive more credit in AO1, AO2 and AO3 Zones:

   a. In AO1 and AO2 Zones, add 2 to FB.

   b. In AO3 Zones, add 1 to FB.

7. If the requirement for freeboard is limited to areas where there are base flood elevations, or otherwise does not apply to all new construction, then an impact adjustment must be made using Option 2 or 3 (see Sections 432.b and 432.c).

8. If the community requires that electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities (including ductwork) be elevated or made of flood-resistant materials above the base flood elevation, but does not require these facilities to be elevated or protected to the freeboard level, multiply FB by 0.75. If the community does not require that these facilities (including ductwork) be elevated or protected to or above the base flood elevation, there is no credit for FRB.

The NFIP rules require that the lowest floor of residential structures be elevated to or above the base flood elevation and that non-residential structures be elevated or floodproofed to or above the base flood elevation. Attached garages and utilities (including electrical, heating, ductwork, ventilating, plumbing, and air conditioning equipment) must also be protected to the base flood elevation (44 *CFR* 60.3(a)(3)). This can be done by elevating them or constructing them of flood-resistant materials.

A freeboard requirement adds height above the base flood elevation to provide an extra margin of protection to account for waves, debris, miscalculations, or lack of data. A freeboard requirement of 1 foot would require the same standards at 1 foot above the base flood elevation.

For CRS credit, freeboard must be applied not just to the elevation of the lowest floor of the building or to the elevation to which a non-residential building is dry floodproofed, but also to the level of protection provided to all components of the building. All building utilities, including ductwork, must be elevated or protected to the freeboard level and all portions of the building below the freeboard level must be constructed using materials resistant to flood damage. If the garage floor is below the freeboard level, the garage must meet the opening requirements for enclosures. Two excellent references on these requirements are *Protecting Building Utilities from Flood Damage*, FEMA-348 and *Flood-Resistant Materials Requirements*, FIA-TB-2.
Base flood and 500-year flood elevations can be found in the community's Flood Insurance Study profiles. More details about items 3–8 are provided below.

3. Detailed riverine flood studies that produce a floodway provide a flood elevation based upon the floodway encroachment. In a flood insurance study, these elevations are listed in the "With Floodway" column in the Floodway Data Table. They are generally higher than the "Without Floodway" or "Regulatory" flood elevations. As noted in 431.a.3, if the community's

ordinance requires that the building be protected to at least 1 foot above this encroached elevation, FB = 1.5, FRB = 150.

4. A community may use the actual height of the 500-year flood if it is at least 1 foot above the base flood elevation.

5. If the requirement is that the bottom of the floor joists, duct work, etc., be at least 1.0 feet above the base flood elevation, FB = 2, FRB = 200.

6. In AO Zones, base flood depths are provided instead of base flood elevations in relation to mean sea level. Where depths are not provided, the NFIP regulations require new buildings to be elevated 2 feet above the highest adjacent grade. Some communities misinterpret this requirement as 2 feet of freeboard. Elevating 2 feet above the base flood depth is a creditable freeboard requirement. Elevating 2 feet above the highest adjacent grade in an AO Zone where no base flood depth is provided is a minimum requirement of the NFIP and is not eligible for credit.

7. If the freeboard requirement does not affect all buildings, then the Option 2 or Option 3 impact adjustment must be used. For example, many ordinances only require freeboard where a base flood elevation is provided. Others only require freeboard for elevated buildings (non-residential buildings may be floodproofed to the base flood elevation without freeboard). Often the requirements for manufactured homes are in a different location in the ordinance and may not have the same standards as other types of structures. In these cases, the community can either identify and measure the areas affected for Option 3 or use Option 2. Impact adjustments are discussed in Section 432.

8. Sections 60.3a(3)(ii) and (iv) of the NFIP regulations requires that buildings "(ii) be constructed with materials resistant to flood damage" and " be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding."

   Many communities have focused on elevating the top of the lowest floor, but have allowed utilities (especially ductwork) to hang below the floor joists and be flooded. Flooded ductwork can add thousands of dollars to an insurance claim. This is primarily a concern for buildings on crawlspaces. Buildings on slab foundations, on pilings, and in V Zones normally have the utility facilities waterproofed or elevated high enough.

   Therefore, to receive full credit for this element, electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities (including ductwork) must be elevated or waterproofed to the base flood elevation plus freeboard. A community can receive 75% of the appropriate credit if it requires the utility facilities (including ductwork) to be elevated to or above the base flood elevation, but not necessarily to the freeboard level. If the utilities and ductwork are not required to be elevated, floodproofed, or otherwise protected to the base flood elevation, there is no credit for FRB. These alternatives are illustrated in Figure 430-1.

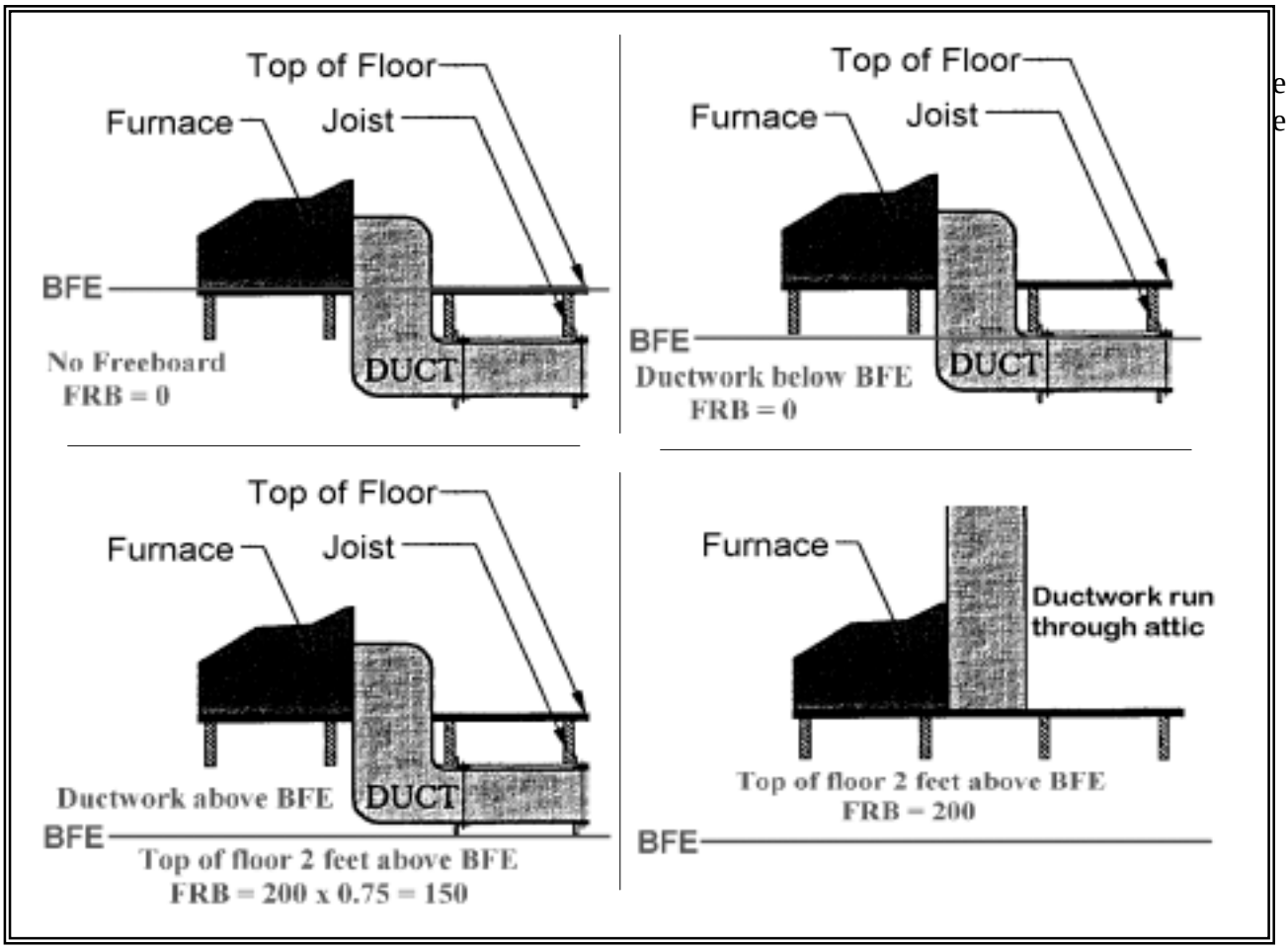


Figure 430-1. Adjusting freeboard credit based on the location of ductwork.

Example 431.a-1. Sample ordinance language could read:

a. "New construction or substantial improvement of any residential or non-residential structure shall have the lowest floor, including basement, together with attendant utility and sanitary facilities, elevated no lower than 18 inches above the base flood elevation." [FB = 1.5, FRB = 100 x 1.5 = 150]

b. "The Flood Protection Elevation is 2 feet above the base flood elevation as determined in the Flood Insurance Study and other floodplain studies. In areas of shallow flooding, it is 2 feet above the depth shown on the Flood Insurance Rate Map (FIRM)."

   Instead of regulating to the "base flood elevation" the ordinance would regulate to the "Flood Protection Elevation."
   [FB = 2, FRB = 200]

c. "All structures, together with attendant utility and sanitary facilities, shall be elevated 2 feet above the 500-year flood elevation as determined in the Flood Insurance Study." [FRB = 300]

d. "Within areas of shallow flooding (Zones AO1 and AO2 on the FIRM), new construction or substantial improvement of any structure shall have the lowest floor, together with attendant utility and sanitary facilities, elevated no lower than 2 feet above the depth number."
[FB = 2 + 2 = 4, FRB =300]

e. "All structures, together with attendant utility and sanitary facilities, shall be elevated 1 foot above the elevation of the 100-year flood with encroachments as determined by the Flood Insurance Study." [FB = 1.5, FRB = 150]

b. Foundation protection (FDN) (Maximum credit: 35 points). This credit is not available in V Zones because foundation protection is a minimum NFIP requirement in V Zones.

1. FDN = 35, if all new buildings must be constructed on properly designed and compacted fill (ASTM D-698 or equivalent) that extends beyond the building walls before dropping below the base flood elevation and has appropriate protection from erosion and scour. The fill design or the fill standard must be approved by a licensed professional engineer.

2. FDN = 20, if all new buildings built on fill must be constructed on properly designed and compacted fill (ASTM D-698 or equivalent) that extends beyond the building walls before dropping below the base flood elevation and has appropriate protection from erosion and scour.

3. FDN = 10, if the community has adopted and enforces the soil testing and compaction requirements of the Standard, Uniform, or National Building Codes or the International Residential and Building Codes.

Foundation protection may provide protection against differential settling as well as scour and erosion. An engineer's certificate is not needed for each structure if the community has adopted an engineered standard and requires compliance with that standard. ASTM (American Society for Testing and Materials) Standard D-698 requires compaction to 95% of the maximum density obtainable using the Standard Proctor Test method.

Under this element, 35 points are provided if all new buildings have engineered foundations. Twenty points are provided if new buildings that will be built on fill have specific standards for the compaction and design of the fill (and the community has no special standards for buildings that are not built on fill). The model building codes only have compaction standards, so 10 points are provided if the community has adopted those standards.

All three national model building codes have language relating to soils, compaction of fill, and construction of footings and piles. They are found in these sections of the applicable codes:

- Sections 1612 and 1803.4 and Appendix K of the *International Residential Code* of the International Code Council (ICC).
- Sections R401.2 and R506.2.1 of the *International Building Code* of the International Code Council (ICC).
- Chapter 18, "Foundations," in the *Standard Building Code* (1997 edition) developed by the Southern Building Code Congress International (SBCCI) (known as Chapter 18 in the 1994 and 1996 editions).
- Chapter 29, "Excavations, Foundations, and Retaining Walls," and Chapter 70, "Excava-tion and Grading," of the *Uniform Building Code* (1991 edition) of the International Conference of Building Officials (ICBO) (1994 edition: Chapters 18 and 33).
- Chapter 18, "Foundations and Retaining Walls," of the Building Officials and Code Administrators (BOCA) *National Building Code* (1993 edition).

Communities that have adopted the section of the appropriate model code are awarded 10 points for FDN.

See also *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/mit/techbul.htm).

c. Cumulative substantial improvement rules (CSI) (Maximum credit: 110 points)

CSI is the total of the following points:

1. One of the following:
   - (a) 45, if the regulations require that improvements, modifications, and additions to existing buildings are counted cumulatively for at least 10 years, or
   - (b) 25, if the regulations require that improvements, modifications, and additions to existing buildings are counted cumulatively for at least 5 years.
2. One of the following:
   - (a) 45, if the regulations require that reconstruction and repairs to damaged buildings are counted cumulatively for at least 10 years, or
   - (b) 25, if the regulations require that reconstruction and repairs to damaged buildings are counted cumulatively for at least 5 years, or
   - (c) 20, if the community adopts regulatory language that qualifies properties for Increased Cost of Compliance insurance coverage for repetitive losses.
3. 20, if the regulations require that any addition to a building be protected from damage from the base flood.

The NFIP allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements. Over the years, a community may issue a succession of permits for different repairs or improvements to the same structures. This can greatly increase the overall flood damage potential within a community as well as the insurance liability to the Federal Insurance and Mitigation Administration.

This element provides credit to a community that ensures that the total value of all improvements or repairs permitted over the years does not exceed 50% of the value of the structure. When the total value does exceed 50%, the original building must be protected according to the ordinance requirements for new buildings.

This element may require no specific ordinance language, but simply a policy decision to interpret the 50% improvement threshold as cumulative. In such cases, the documentation must include a legal opinion or directive from the community's legal counsel stating how the ordinance is to be interpreted. Either way, the community needs to maintain permit records by parcel number or address, so that the history of improvements or repairs to a particular structure is checked before the next permit is issued.

If a community does not regulate for cumulative substantial improvements, it may still receive credit for regulation of additions. Additions within the footprint of the original building would have to be to a floor above the base flood elevation. Additions outside the footprint of the original building would have to be elevated (or, for non-residential structures, floodproofed) above the base flood elevation.

Under some circumstances the NFIP insurance policy may pay part of the cost of bringing a substantially flood-damaged building into compliance with the community's floodplain management ordinance. Increased Cost of Compliance coverage is described in Figures 430-5a and b.

d. Lower substantial improvement threshold (LSI) (Maximum credit: 90 points)

LSI credit is based upon the regulatory threshold. Use only one of the following:

1. 90, if the regulatory threshold is less than 10%;
2. 70, if the regulatory threshold is 10% to 24%;
3. 50, if the regulatory threshold is 25% to 39%;
4. 30, if the regulatory threshold is 40% to 44%;
5. 10, if the regulatory threshold is 45% to 49%; or
6. 20, if the regulatory threshold is no more than 25% of the bulk or square footage of the building's first floor.
7. If the lower substantial improvements threshold applies to EITHER improvements, modifications, and additions OR reconstruction and repairs, but not both, the value for LSI is multiplied by 0.5.

This element has the effect of requiring more structures to come into compliance after a disaster because damage repair is included in "improvements" under the NFIP rules. Since a community participating in the NFIP already has a threshold, it is only necessary to change the number specified in its ordinance or regulations. A community must be sure that a minimum threshold is not set by state law before it adopts a different standard.

Under some circumstances the NFIP flood insurance policy may pay part of the cost of bringing a substantially flood-damaged building into compliance with the community's floodplain management ordinance. Increased Cost of Compliance coverage is described in Figures 430-5a and b.

NOTE: *By statute, Increased Cost of Compliance (ICC) can only be provided after a finding of 50% or more damage. ICC is not provided if the damage is less than 50%, even though the local ordinance declares the building substantially damaged. Communities receiving LSI credit for lower substantial improvement thresholds need to be aware that there may be times when their higher regulatory standard will not trigger ICC payments for their residents.*

Example 431.d-1.

Watertown's ordinance has a section on protecting buildings from flood damage. It applies

a. When a new building is constructed,

b. When an existing building is substantially improved or substantially damaged, and

c. When an existing building is structurally altered such that the first floor area is increased by more than 20%.

Sections a and b are minimum requirements of the NFIP but Section c exceeds the NFIP criteria and will result in more buildings being treated as substantial improvements: LSI = 20.

e. Protection for critical facilities (PCF) (Maximum credit: 100 points)

For CRS credit purposes, critical facilities are defined in Section 130.

1. PCF = 100, if new critical facilities are prohibited from the 500-year floodplain;
2. PCF = 75, if new and substantially improved critical facilities are required to be protected from damage and loss of access as a result of the 500-year flood or the flood of record, whichever is higher.
3. PCF = 50, if new and substantially improved critical facilities must be protected to the 500-year flood level.

Note that credit is provided only if there is regulatory language that protects critical facilities. The fact that there are currently no critical facilities in the regulated floodplain may indicate community policy, but adopted regulations are required for PCF credit.

Requiring protection for critical facilities serves several purposes: it reduces damage to vital public facilities; it reduces pollution of flood waters by hazardous materials; and, most importantly, it ensures that the facilities will be operable during most flood emergencies.

To receive full credit for this element, the regulations must be enforced in the 500-year floodplain. On older FIRMs, the 500-year floodplain is shown as a B Zone. The ordinance can simply specify the types of facilities prohibited from or protected within the A and B Zones. On newer FIRMs with AE and X Zones, the 500-year floodplain is shown as a shaded X Zone. In either case, the 500-year flood elevation becomes the "flood protection elevation" for critical facilities.

f. Protection of floodplain storage capacity (PSC) (Maximum credit: 80 points)

PSC is either:

1. 80, where regulations prohibit fill within floodplains or flood fringes, including construction of buildings on fill; or
2. 70, where regulations require that new developments provide compensatory storage at hydraulically equivalent sites.

Credit is not provided for protection of storage capacity in floodways only.

Although a building built on fill and elevated above the base flood elevation meets the NFIP rules, filling a substantial portion of the floodplain reduces storage for flood water and tends to increase peak flows downstream. Prohibiting fill will reduce this problem, as will requiring the provision of a similar volume of compensatory storage if fill is placed in the floodplain.

Credit is not provided for protection of storage capacity in floodways only. The minimum NFIP requirement that nothing be allowed in floodways that will increase the flood elevation generally protects storage in floodways. This element is most effective in fringe areas.

Example 431.f-1. Sample ordinance language could read:

> Whenever any portion of a floodplain is authorized for use, the space occupied by the authorized fill or structure below the base flood elevation shall be compensated for and balanced by a hydraulically equivalent volume of excavation taken from below the base flood elevation. All such excavations shall be constructed to drain freely to the water-course: PSC = 70

Example 431.f-2. Floodville's regulations prohibit fill in the floodplain: PSC = 80

g. Natural and beneficial functions regulations (NBR) (Maximum credit: 40 points)

NBR is the total of the following points:

1. a. 10, where regulations prohibit ALL activities in the floodplain that may be hazardous to public health or water quality; OR

   b. 5, where regulations prohibit one or two specific activities in the floodplain that may be hazardous to public health or water quality, such as sanitary landfills or septic systems.

2. 15, where regulations require new floodplain developments to avoid or minimize disruption to shorelines, stream channels, and their banks.

3. EITHER:

   15 for regulations adopted pursuant to a Habitat Conservation Plan or similar plan that has been credited under Section 511.b., OR

   10, for regulations that protect aquatic or riparian habitat from new development.

Public health regulations restrict activities in the floodplain that could harm the natural and beneficial functions of floodplains. Water quality is degraded and health hazards result when septic systems malfunction or when septic water and surface water mix during a flood.

Another approach that allows development but minimizes its impact is to prevent or minimize channel modifications and other disturbances to river, stream, or ditch channels and lake and ocean shores. A setback requirement that prevents development from an area adjacent to a channel or shoreline should receive additional credit under Activity 420 (Open Space Preservation).

Section 511.b in Activity 510 (Floodplain Management Planning) provides CRS credit for adopting a plan to protect threatened aquatic or riparian species. If the community receives credit for such a plan in Activity 510, and enacts development regulations recommended by that plan, it would receive the 15 points under g.3.

Example 431.g-1. Floodville is concerned about the bottomland hardwood forest that is not in the City Park. To protect it, the City amended its ordinance to require a landscaping plan as a condition for a permit to construct, regrade, or otherwise develop in the bottomland. The landscaping plan is subject to approval by the City's Environment Conservation Commission before a permit is issued. NBR = 15.

h. Enclosure limits (ENL) (Maximum credit: 300 points)

ENL is EITHER:

1. 300, if regulations prohibit ANY building enclosures, including breakaway walls, below the base flood elevation; OR

2. The total of the following points:

   a. 100, if regulations prohibit enclosures of areas greater than 300 square feet, including breakaway walls, below the base flood elevation. The area enclosed must still meet all NFIP requirements for openings, anchoring, and flood-resistant materials.

   b. 50, if regulations require that the owner of a building sign a nonconversion agreement, promising not to improve, finish, or otherwise convert the area below the lowest floor and granting the community the right to inspect the enclosed area.

Regulations to limit enclosures below the base flood elevation have two objectives. First, they minimize a potential source for debris that may hit other buildings. Second, they discourage finishing the area below the base flood elevation and storing valuable or hazardous items in that area.

These regulations are particularly useful in V Zones and other coastal areas subject to wave damage and where flood depths result in the lowest floor being 8 feet or more above grade. In the latter case, there is a tendency for the lower areas to be enclosed. Eventually, these enclosed areas are converted to bedrooms, family rooms, or other finished areas, in violation of floodplain management regulations. Breakaway walls are enclosures and must be prohibited in order to receive the 300 points under Option 1. Screening and open lattice-work are not considered enclosures.

The community may opt to enforce these enclosure limits only where the lowest floor is more than five feet above grade. Where the lowest floor is less than five feet above grade, a crawlspace with the proper openings may be more appropriate than an open area elevated on columns or piles. With less than five feet in height, the lower area is not likely to be improved or modified into a liveable space and the enclosure limits are not needed.

Under a nonconversion agreement, the owner agrees to not modify the enclosed area to make it more susceptible to flood damage. Because this area is not visible from the street, the agreement must also allow the community the right to enter the property and inspect the inside of the enclosure periodically. An

example nonconversion agreement appears as Figure 430-6. As with all legal documents, the community should have such an agreement approved by its attorney before it is used.

If the community also requires that the nonconversion agreement be filed with the deed and other property records, it would receive credit under Activity 340 (Hazard Disclosure), Section 341.b, other disclosure requirements (ODR).

i. Other higher standard (OHS) (Maximum credit: 50 points)

OHS = up to 50 points for higher regulatory standards that prevent flood losses or protect natural and beneficial floodplain functions that are not otherwise credited in another element. The community's regulatory language is reviewed by the Federal Emergency Management Agency (FEMA) to determine the credit points.

This element provides CRS credit for regulatory approaches and standards that are not addressed in the other elements of this or other activities. Each submittal for credit is individually reviewed and scored with a value of 1 to 25 points for each item. Examples of possible submittals include, but are not limited to:

- Prohibiting floodproofing as a flood protection measure for any new building (i.e., requiring all new buildings, including non-residential buildings, to be elevated);
- Requiring new streets in the floodplain to be at or above the base flood elevation to provide access for emergency vehicles during a flood; and
- Requiring all new multi-family and commercial buildings to provide dry land access.

j. Land development criteria (LD) (Maximum credit: 700 points)

Credit for land development criteria and low density zoning is described in Section 430LD. The credit points, cLD, are added to the other elements in Activity 430.

Example 431.j-1. As explained in the examples in Section 430LD, Watertown receives credit for its floodplain protection and zoning regulations. The credit, cLD = 160.95, is added to the scores for the other elements.

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 each of the special hazards.

The CRS encourages communities to devote special attention to areas affected by one of 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 "*CRS Credit for*" publications that are listed in the special hazards section of Appendix E). Those publications show 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.

l. 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.

Contact the ISO/CRS Specialist to obtain the SMS credit for a community. It 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.l-1: Floodville's state requires a floodway mapping standard of 0.5' 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.

SMS = 0.1 x 100 = 10.

m. Building code (BC) (Maximum credit: 120 points)

BC = the sum of the following:

1. 10 x (7 - 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 60 points for adopting the complete set of the International Code Series (I-Codes). This credit is the sum of the following points:

   (a) 25, if the community has adopted the current edition of the International Building Code

   (b) 25, if the community has adopted the current edition of the International Residential Code

   (c) 10, if the community has adopted the current edition of all of the following codes:

   (1) International Plumbing Code
   (2) International Mechanical Code
   (3) International Fuel Gas Code
   (4) International Private Sewage Disposal Code

   (d) These credits are reduced if the community adopts only parts of each code.

Even though a CRS community has been deemed to be in full compliance with the NFIP, it may not have a building code. Most 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 International Building Code series (I-Codes).

BCEGS: To recognize the benefits to adopting and enforcing a building code, one is required for a CRS Class 7 or better (see Section 211.b and c). The Building Code Effectiveness Grading Schedule (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 catastrophic related damages (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, commercial and personal (residential). 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 commercial BCEGS rating and a class 5 residential rating, the CRS considers it a class 6 BCEGS community.

Under this element, the credit for BCS is determined by subtracting the BCEGS class from 7 and multiplying the result by ten. There is no credit for BCEGS classes 7, 8, 9, or 10. For example, if a community has a BCEGS class 4, BCS = 10 x (7 - 4) = 10 x 3 = 30.

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 substitute 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 horizontal structural members in V Zones, certifications for openings that are designed differently from minimum NFIP criteria, anchoring of pile and column foundation elements in V Zones, and breakaway walls in V Zones when design strength exceeds minimum criteria.

Construction Quality. In the absence of a building code, there is no assurance that buildings placed in floodplains, 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 has 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 the Insurance Services Office through the ISO/CRS Specialists listed in Appendix G.

Example 431.l-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 = 10 x (7 - 5) = 10 x 2 = 20

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 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 other ordinances and regulations.

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 60 points for adoption of the complete series. Adoption of Appendix G is optional for CRS credit, provided the community has other regulations that meet all the NFIP requirements.

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.

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

STF =

1. 50, if all regulatory staff are certified floodplain managers (CFMs).
2. 25, if all proposed development projects in the floodplain and the certificates of occupancy for such projects are reviewed by a CFM.

3. 5, for having one graduate of an approved course on managing floodplain development through the NFIP in the office that regulates floodplain development.

4. 5, for each additional CFM or EMI graduate on the community's staff.

The maximum credit for course graduates is 25 points.

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 staff must fulfill a continuing education requirement to maintain their certification.

Credit for items n.1 and n.2. are dependent on Certified Floodplain Managers 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 before a certificate of occupancy is issued. The CFM may be a consultant, employee of a regional agency, etc., as long as no floodplain development project is approved or occupied without his or her review.

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 n.2. Otherwise, if some members of the regulatory staff are CFMs, but some floodplain development projects are approved by non-CFMs, then five points is 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 five-day field-deployed version of this course, the home study version of this course, or other equivalent training.

Coastal communities' staff may be credited for graduating from the EMI "Residential Coastal Construction Course." The credit for training is based on the number of courses taken. If two people take the "Managing Floodplain Development" course, it is worth 10 points, the same credit provided if one person took both the "Managing Floodplain Development" and coastal construction courses. More information on the EMI courses can be found in Section 435.

If the community is seeking credit for having the person responsible for floodplain permits graduated from the Emergency Management Institute's (EMI) 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). The points may be prorated if the regulations adopt some, but not all, of these construction requirements.

   (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 greater than 300 square feet, 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 less than the 3-foot criteria 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.

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:

431l State-mandated regulatory standards (SMS)

431m Building code (BC)

431n Staffing (STF)

431o Manufactured home parks (MHP)

The impact adjustment for 431e, 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 (rXXX = 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 - rOS (rXXX = 1.0 - rOS).

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 rOS.

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, rLSI = 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, rOS = 0.22. Under Option 1, rPSC = 1.0 - rOS = 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 (rXXX = 0.25).

2. For coastal AE Zone credit (CAZ), under option 2, rCAZ = 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. $rCSI = \frac{aCS\ I}{aRF}$

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. $rOHS = \frac{aOHS}{aRF}$

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).

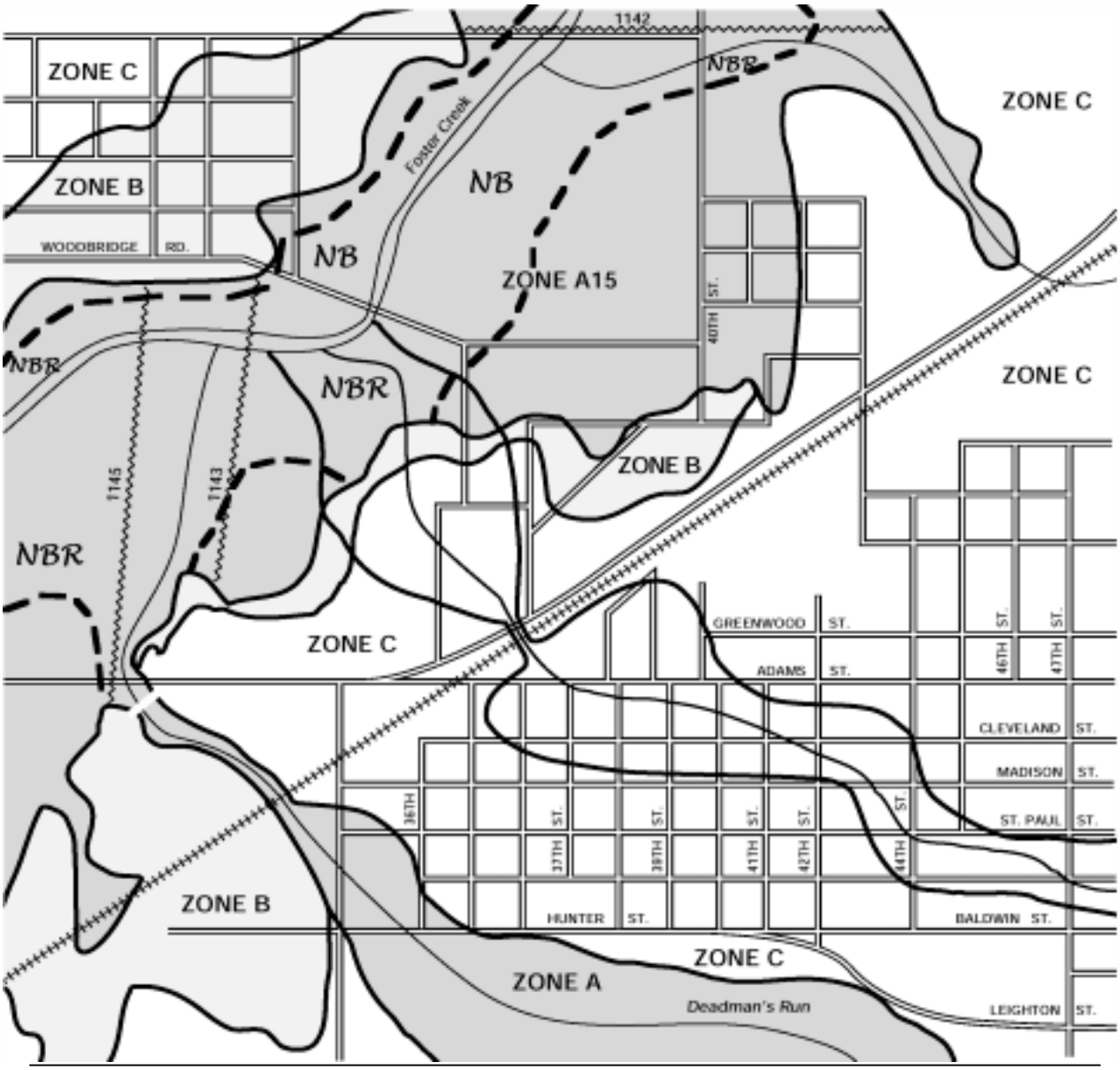
If Option 3 is used, each variable for which credit is requested must be appropriately designated on the Impact Adjustment Map described in Section 403. In many communities, these regulatory standards will be applicable throughout the community's floodplains, so a note on the key will be adequate.

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 land-scaping 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 x rOS) = 0.25 - (0.25 x 0.22) = 0.25 - 0.06 = 0.19. rNBR will be smaller under Option 2, so Floodville uses Option 3, and rNBR = 0.23.



Impact Adjustment Map

Area	Size (acres)	Notes
aRF	396	Foster Creek, Deadman's Run and problem ditch floodplains
aNBR	91	Foster Creek bottomlands outside of park

Figure 430-3. Floodville's Impact Adjustment Map.

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.

$$rFRB2 = \frac{aFRB2}{aRF} = \frac{0.43}{0.52} = 0.83 \quad rFRB1 = \frac{aFRB1}{aRF} = \frac{0.09}{0.52} = 0.17$$

433 Credit Calculation

a. cFRB = FRB x rFRB

b. cFDN = FDN x rFDN

c. cCSI = CSI x rCSI

d. cLSI = LSI x rLSI

e. cPCF = PCF x rPCF

f. cPSC = PSC x rPSC

g. cNBR = NBR x rNBR

h. cENL = ENL x rENL

i. cOHS = OHS x rOHS

j. cLD = cLD from Section 434LD

k. cSH = cSH from Section 434SH

l. cSMS = SMS

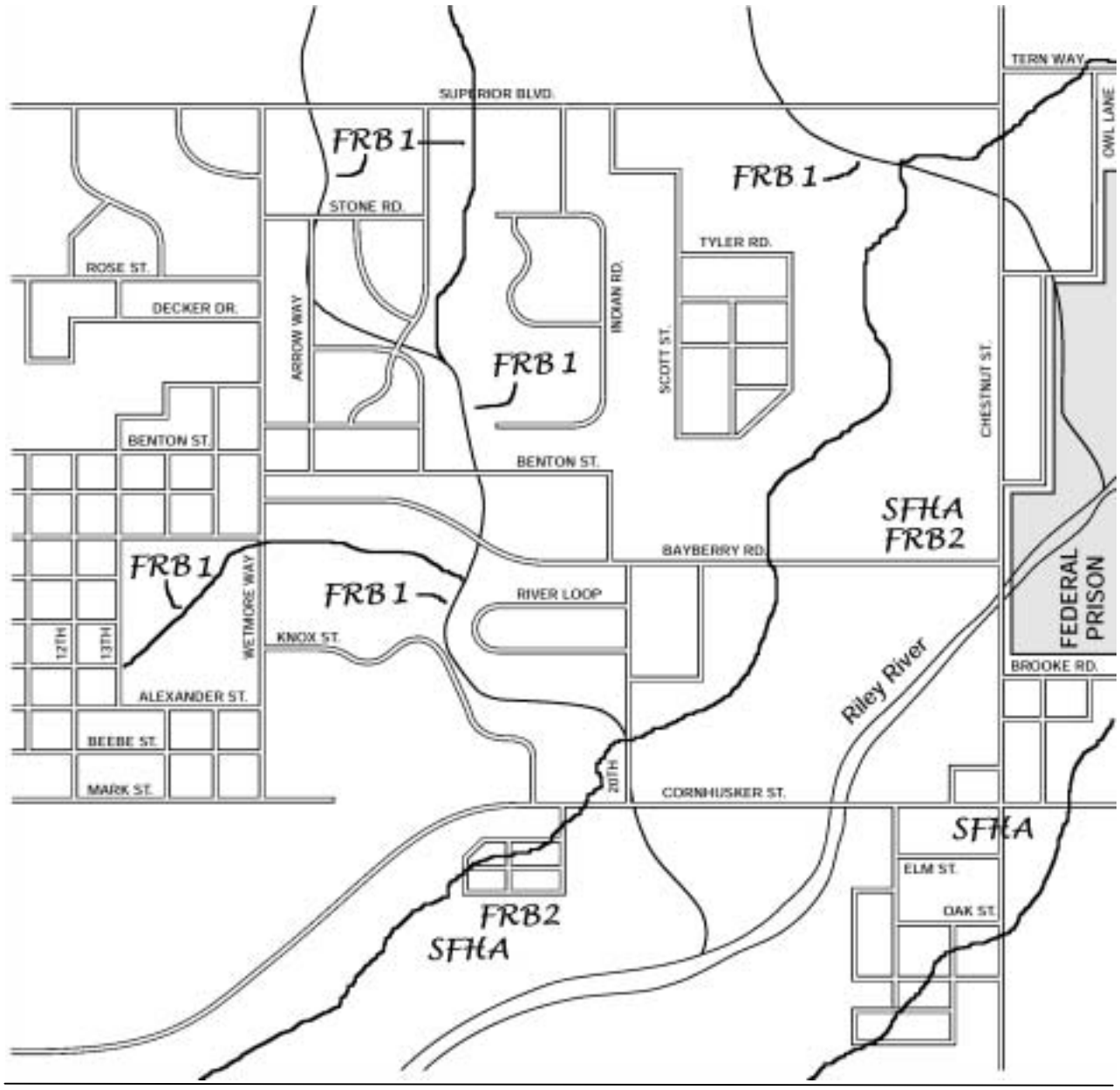
m. cBC = BC

n. cSTF = STF

o. cMHP = MHP

p. cCAZ = CAZ x rCAZ

q. c430 = cFRB + cFDN + cCSI + cLSI + cPCF + cPSC+ cNBR + cENL + cOHS + cLD + cSH + cSMS + cBC + cSTF + cMHP + cCAZ



Impact Adjustment Map

Area	Size (sq. miles)	Notes
aFRB1	0.09	1 foot freeboard
aFRB2	0.43	2 feet freeboard
aRF	0.52	All floodplains draining ≥ 40 acres

Figure 430-4. Watertown's Impact Adjustment Map.

Example 433-1. Floodville's values for higher regulatory standards are zero except for the following:

cPSC = PSC x rPSC = 80 x 0.78 = 62.4.

cNBR = NBR x rNBR = 15 x 0.23 = 3.45

cSMS = SMS = 10

cBC = BC = 20

cSH = 16.92 (from example in Section 434SH in *CRS Credit for Management of Ice Jam Hazards*).

c430 = cFRB + cFDN + cCSI + cLSI + cPCF + cPSC + cNBR + cENL + cOHS + cLD + cSH + cSMS + cBC + cSTF + cMHP + cCAZ

= 0 + 0 + 0 + 0 + 0 + 62.4 + 3.45 + 0 + 0 + 0 + 16.92 + 10 + 20 + 0 + 0 + 0 = 112.77, which is rounded to 113.

During the verification visit, the ISO/CRS Specialist reviews a sample of ten recent developments and discovers that one of the ten received a variance from the PSC requirement. Credit for PSC is reduced by 9/10 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.

c430 = 0 + 0 + 0 + 0 + 0 + 56.88 + 3.45 + 0 + 0 + 0 + 16.92 + 10 + 20 + 0 + 0 + 0 = 107.25, which is rounded to 107.

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 x 0.17) + (200 x 0.83) = 17 + 166 = 183.

cLSI = LSI x rLSI = 20 x 1.0 = 20

Watertown has credit for land development criteria and two areas of low density zoning in Foster Creek. cLD = 160.95 (from example in Section 433LD).

c430 = cFRB + cFDN + cCSI + cLSI + cPCF + cPSC + cNBR + cENL + cOHS + cLD + cSH + cSMS + cBC + cSTF + cMHP + cCAZ

c430 = 183 + 0 + 0 + 20 + 0 + 0 + 0 + 0 + 0 + 160.95 + 0 + 0 + 0 + 0 + 0 + 0 = 363.95, which is rounded to 364.

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 which adopts the regulatory standard. The appropriate acronym(s) (FRB, FDN, etc.) must be marked in the margin of the sections of the ordinance which 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 (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.

d. I[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 FRB, the community should explain its general building permit inspection process, demonstrating that this process ensures that structures are actually elevated as required by the ordinance.

For 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

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.

CRS Credit for Higher Regulatory Standards

CRS Credit for Management of Areas Subject to Uncertain Flow Path Hazards

CRS Credit for Management of Areas Adjacent to Closed Basin Lake Hazards

CRS Credit for Management of Ice Jam Hazards

CRS Credit for Management of Floodprone Areas Subject to Land Subsidence Hazards

CRS Credit for Protecting Coastal Dunes and Beaches

CRS Credit for Management of Mudflow Hazards

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.

User's Guide to Technical Bulletins, FIA-TB-0, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Openings in Foundation Walls, FIA-TB-1, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Flood-Resistant Materials Requirements, FIA-TB-2, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Non-Residential Floodproofing—Requirements and Certification, FIA-TB-3, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Elevator Installation, FIA-TB-4, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Free-of-Obstruction Requirements, FIA-TB-5, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Below-Grade Parking Requirements, FIA-TB-6, April 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Wet Floodproofing Requirements, FIA-TB-7, December 1993. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

Corrosion Protection for Metal Connections in Coastal Areas, FIA-TB-8, 1996. (Also available from FEMA's website at http://www.fema.gov/mit/techbul.htm).

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/mit/techbul.htm).

Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials, FEMA-116, Federal Emergency Management Agency, 1987.

Interim Guidance for State and Local Officials—Increased Cost of Compliance Coverage, FEMA, 1997. (Also available from FEMA's website at http://www.fema.gov/library/lib06.htm).

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/library/lib06b.htm

FEMA's regulations can be found at:
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 your state emergency management agency's training office.

e. More information on building codes, including the International Codes, can be obtained from the national model code organizations:

Building Officials and Code Administrators International, Inc.
4051 West Flossmoor Road
Country Club Hills, IL 60478-5795
1-800 214-4321
http://www.bocai.org

International Conference of Building Officials
5360 Workman Mill Road
Whittier, CA 90601-2298
(888) 699-0541
http://www.icbo.org

Southern Building Code Congress International, Inc.
900 Montclair Road
Birmingham, AL 35213-1206
(205) 591-1853
(888) 447-2224
http://www.sbcci.org

Reducing Flood Losses Through the International Code Series, May, 2000, was published jointly by the above model code organizations, FEMA, the Association of State Floodplain Managers, and the American Society of Civil Engineers. Hard copies can be ordered from the code organizations. It can also be downloaded from: http://www.fema.gov/library/fldlosses.htm

f. For more information on floodplain manager certification, contact the Association of State Floodplain Managers at (608) 274-0123 or 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 $20,000. 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.

CRS NOTE: *By statute, an ICC claim can only be paid upon a substantial damage determination based on the NFIP's 50% damage criteria. An ICC claim will not be paid if the damage is less than 50% of the market value, even if the local ordinance declares the building substantially damaged. Communities receiving LSI credit for lower substantial improvement thresholds need to be aware that there may be times when their higher regulatory standard will not trigger an ICC claim payment for their residents.*

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 430-5a. Increased Cost of Compliance 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 431.c.1(a) and (b).

Additional guidance on ICC coverage can be found in the *National Flood Insurance Program Interim Guidance for State and Local Officials—Increased Cost of Compliance Coverage, FEMA 301/September 1997* (and from FEMA's Website at http://www.fema.gov/library/lib06.htm).

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 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 as follows:

"Substantial Damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged 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 430-5b. Increased Cost of Compliance insurance coverage (page two).

This DECLARATION made this ___ day of _____, 19__, by _____ _____ ("Owner") having an address at _____ .

WITNESSETH:

WHEREAS, the Owner is the record owner of all that real property located at _____ in the City of _____ in the County of _____, designated in the Tax Records as _____.

WHEREAS, the Owner has applied for a permit to place a structure on that property that has an enclosed area below the base flood elevation constructed in accordance with the requirements of Article _____ Section _____ of the Floodplain Management Ordinance of _____ ("Ordinance") and under Permit Number _____ ("Permit").

WHEREAS, the Owner agrees to record this DECLARATION and certifies and declares that the following covenants, conditions and restrictions are placed on the affected property as a condition of granting the Permit, and affects rights and obligations of the Owner and shall be binding on the Owner, his heirs, personal representatives, successors, future owners, and assigns.

UPON THE TERMS AND SUBJECT TO THE CONDITIONS, as follows:

1. The structure or part thereof to which these conditions apply is: _____ _____ .

2. At this site, the Base Flood Elevation is _____ feet above mean sea level, National Geodetic Vertical Datum.

3. Enclosed areas below the Base Flood Elevation shall be used solely for parking of vehicles, limited storage, or access to the building. All interior walls, ceilings and floors below the Base Flood Elevation shall be unfinished or constructed of flood resistant materials. Mechanical, electrical or plumbing devices shall not be installed below the Base Flood Elevation.

4. The walls of the enclosed areas below the Base Flood Elevation shall be equipped and remain equipped with openings as shown on the Permit.

5. The jurisdiction issuing the Permit and enforcing the Ordinance may take any appropriate legal action to correct any violation. Any alterations or changes from these conditions also may render the structure uninsurable or increase the cost for flood insurance.

6. A duly appointed representative of the City is authorized to enter the property for the purpose of inspecting the exterior and interior of the enclosed area to verify compliance with this Declaration. Such inspections will be conducted upon due notice to the Owner and no more frequently than once each year. More frequent inspections may be conducted if an annual inspection discovers a violation of the Permit.

7. Other conditions: _____

_____

In witness whereof the undersigned set their hands and seals this _____ day of _____, 19 __.

_____	_____
_____	_____
Owner	Witness

Figure 430-6. Example nonconversion agreement.

430LD LAND DEVELOPMENT CRITERIA

Summary of Activity 430LD

431LD Credit Points. This activity has two elements that provide up to 700 points for managing the development of land in ways that minimize construction of buildings in the floodplain.

a. Land development criteria (LDC): Up to 100 points for regulations that require or encourage appropriate uses in the floodplain and/or discourage construction of buildings in floodprone areas. Additional credit is provided under Activity 420 (Open Space Preservation) as open space is set aside through the regulations credited here.

b. Low density zoning (LZ): Up to 600 points are provided for low density zoning. Low density is considered a minimum of 1 acre per building or unit. Maximum credit is provided for a 10-acre or larger minimum lot size. The credit points are calculated by multiplying the minimum lot size by 60. Credit is provided for up to three different zoning densities.

432LD Impact Adjustment. The credit points for each element are adjusted in one of three ways.

1. Under Option 1, if the same requirement is implemented throughout the regulatory floodplain, the impact adjustment ratio is 1.0, minus the ratio for open space.

2. Under Option 2, if part of the area of regulatory floodplain is affected by the land development criteria, the community may use the default value of 0.25. If part of the area of regulatory floodplain is zoned for low density, the community may use the default value of 0.10 for each of its two lowest density zones.

3. Under Option 3, the impact adjustment ratio for each element reflects the proportion of the regulatory floodplain affected (excluding open space areas).

433LD Credit Calculation. The credit points for each element are multiplied by the impact adjustment ratios and the products are totaled.

434LD Credit Documentation. The community must submit the following.

a. The ordinance language that adopts the land development criteria and/or low density zoning standard.

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

b. [If impact adjustment ratios are based on Option 3 (432LDc) The Impact Adjustment Map.

c. An explanation of the community's enforcement procedures.

d. Examples of developments constructed in accordance with the ordinance language.

435LD For More Information

430LD LAND DEVELOPMENT CRITERIA

NOTE: *Use Activity Worksheet AW-430LD for this element.*

Credit is provided for managing the development of land so new projects avoid floodplains or minimize the amount of construction in floodplains. Credit is provided for two approaches: regulations that require or encourage appropriate development and zoning that restricts the use or density of floodplain development.

Background: Appropriate development criteria and low density zoning, like open space preservation, reduce the potential for flood damage by reducing the amount of development in the floodplain. They can also enhance natural and beneficial values and maintain floodplain storage capacity.

The previous activity, 420 (Open Space Preservation), credits keeping vacant areas vacant. This is done through measures such as public ownership and legal restrictions on future construction. The credit is based on the percentage of floodplain land that is preserved as open space.

Most communities have undeveloped areas that are not preserved as open space through one of the means recognized in Activity 420. However, there are many tools that can encourage the owners to keep the floodplain open when a site is developed. 430LD (Land Development Criteria) provides credit for those tools—it recognizes local efforts to minimize construction of buildings in the floodplain.

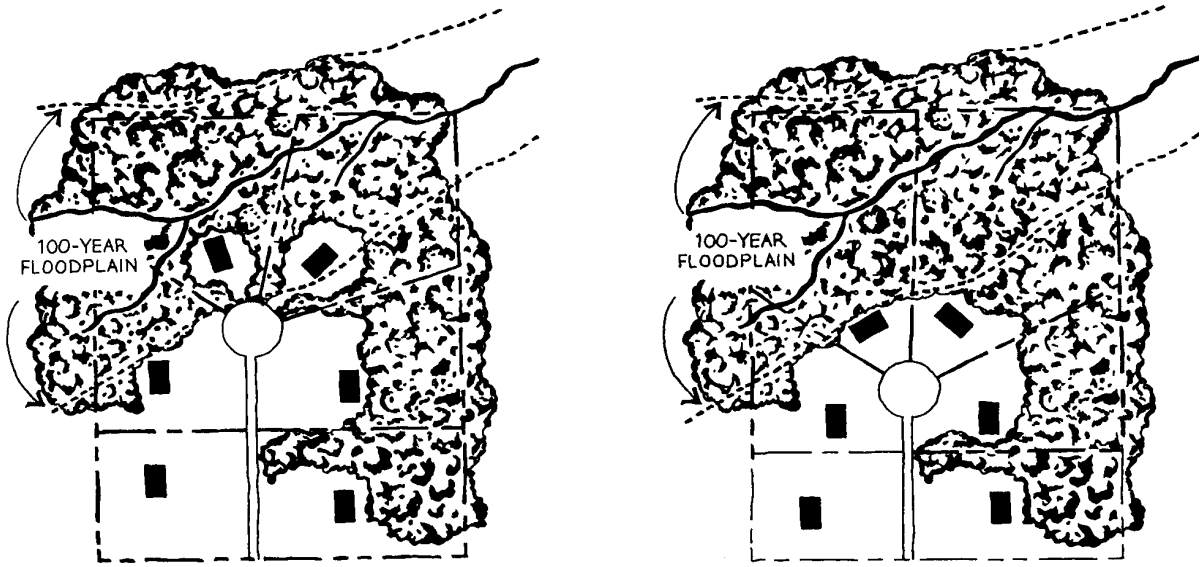
The next activity, 430 (Higher Regulatory Standards), picks up where 420 and 430LD leave off. It credits construction standards for development that is allowed in the floodplain. In other words, these three activities recognize three approaches to floodplain development:

420 (Open Space Preservation) credits keeping development out of the floodplain entirely..

430LD (Land Development Criteria) credits avoiding the floodplain or minimizing what is done in it.

430 (Higher Regulatory Standards) credits more restrictive construction rules for the buildings and other development that is allowed in the floodplain

The most credit points for any single element in these three activities is for preserving floodplains as open space (OS). That is considered the best way to deal with floodplain development. The second highest possible credit points is to minimize the amount of construction in the floodplain through land development criteria or low density zoning—if you have to build in the floodplain, do as little as possible. Examples of ways that development can avoid the floodplain are shown in Figure 430LD-1.

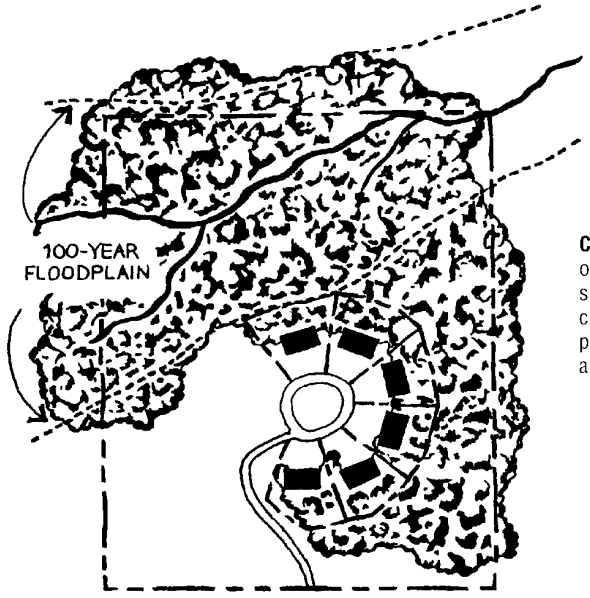


CONVENTIONAL PLAN A

CONVENTIONAL PLAN B

Conventional Plan A: All land on site is subdivided into lots; some lots partially or entirely in floodplain; some homesites in floodplain.

Conventional Plan B: All land on site is subdivided into lots; some lots partially in floodplain; homesites restricted to natural high ground; setbacks and sideyard restrictions modified to accommodate structures out of floodplain.



Cluster Plan: All floodplain lands and other sensitive lands kept as open space; net density remains equal to conventional plans; lot sizes reduced to protect natural features; all homesites are on natural high ground.

CLUSTER PLAN

Figure 430LD-1. Examples of subdivisions that avoid floodplain development.
Source: *Subdivision Design in Flood Hazard Areas*, page 19.

Activity Description: The land development criteria element recognizes a variety of planning and regulatory tools that encourage developers to avoid or minimize development in floodplains. Low density zoning credit is provided for limiting development to no more than one building per acre. Credit increases as the allowable density decreases to one building per 10 acres.

The land development criteria credits are in addition to any open space credit a property may qualify for under Activity 420 (Open Space Preservation). For example, a community can receive 430LD credit for regulations that encourage subdividers to set aside floodprone areas as flowage easements. Once a parcel is appropriately deeded, the community can receive credit under Activity 420 for that site.

Activity 420's credits for open space and this activity's credit for low density zoning are keyed to areas that are currently vacant and preserved as open space or developed at the credited density. The credits are adjusted with an impact adjustment to reflect the amount of floodplain that is affected by the element.

The land development criteria element is treated differently. Even though no areas may qualify as open space, credit is provided for the regulations that require certain review procedures or offer developers incentives to avoid the floodplain. If a parcel is preserved as open space as a result of the regulations, the community can document it and receive open space preservation credit under Activity 420.

There are, in effect, two credits: first for the land development criteria that encourage avoidance of the floodplain, and later for those parcels that are legally kept vacant as a result of the regulations.

431LD Credit Points

a. Land development criteria (LDC): (Maximum credit: 100 points)

1. Credit points. LDC is the total of the following points. The value for LDC cannot exceed 100.

   (a) 100, if the regulations require new subdivisions and other developments to set aside all floodprone lands as open space, drainage or flowage easements, back yards or otherwise keep them free from development. This credit is pro-rated based on the percentage of floodplain kept open by the regulations.

(b) 75, if the regulations require that each lot in a new subdivision provide a building site that is on natural high ground, out of the regulatory floodplain. This credit is not provided if filling the floodplain (or cutting and filling) is allowed to meet the building site requirement.

(c) 50, if the regulations provide for incentives, such as density transfers, bonuses, or other mechanisms to encourage developers to avoid developing in the regulatory floodplain.

(d) 25, if the regulations require developers to submit more than one site plan and one of those alternative plans must keep buildings out of the regulatory floodplain.

(e) 10, if the community's zoning or subdivision regulations allow cluster development or other options to traditional subdivision patterns.

(f) 10, if the community has a land use plan that recommends open space use or low density development of floodprone areas.

Under item (a), if the community requires that floodprone lands be kept undeveloped when an area is subdivided, it could receive 100 points. This does not qualify for credit under Activity 420, because unsubdivided floodprone lands could be built on. If the community requires that 50% of the floodplain be kept open, then 50% of the credit is provided here. After a subdivision's final plat is recorded, the areas set aside could also qualify for open space credit.

There is a variety of other approaches to minimizing the number of buildings allowed in a floodplain that would be credited under this element. *Subdivision Design in Flood Hazard Areas* (see Section 435LD) describes the following:

- Density transfers,
- Transfers of development rights (TDRs),
- Bonuses for avoiding the floodplain,
- Open space subdivision design,
- Mandating more than one site plan, one of which must avoid the floodplain entirely,
- Planned unit developments (PUDs),
- Cluster development,
- Greenway and setback rules, and
- Open space ratio credits for open space in the floodplain.

These approaches may be administered differently, but they can have a similar result: developers are required, encouraged, or rewarded for keeping buildings out of floodprone areas. Buildings, streets, and other damage-prone infrastructure are grouped on high ground (or the area of shallowest flooding), while the more hazardous floodplain is used for open space or recreational land.

These regulations do not have to be enacted for floodplain management purposes. Many communities have adopted them for farmland preservation, protection of sensitive areas, and even for economic reasons. For example, developments such as the example cluster plan in Figure 430LD-1 have shorter streets, resulting in lower maintenance, cleaning, and snow plowing costs for the community.

If a community's program uses an alternative approach to minimize the amount of development or disturbance in the floodplain that is not described here, it should be submitted for scoring in accordance with Section 221. If a community's regulatory program effectively prohibits new buildings from the floodplain, the community should apply for open space preservation credit under Activity 420.

2. Prerequisite. The community must have vacant floodprone areas where the regulations will have a benefit. A community with a completely developed regulatory floodplain is not eligible for this credit.

3. Duplicate credit. A regulatory provision may meet the credit criteria of more than one element. The community may receive the credit for one regulatory provision under the element with the highest points, but not under more than one element.

Under the duplicate credit rule in subsection a.3., one regulatory provision can only be credited once by the CRS. For example, requiring small setbacks along streams (e.g., 10- or 15-foot buffers) is credited under element 431g.2, natural and beneficial functions regulations (NBR) under Activity 430 (Higher Regulatory Standards). Prohibitory setback requirements can also be credited as preserved open space under Activity 420. The community should calculate which approach gives it the most points (after the impact adjustment). In a small community with narrow floodplains, a 15-or 25-foot setback on both sides of a stream may provide more points than an open space provision.

On the other hand, an area can benefit from more than one regulatory provision. A site may be subject to cluster development rules and low density zoning under 430LD and freeboard, setback, and compensatory storage requirements under Activity 430. The community would receive CRS credit for all of these regulatory provisions in all areas where they are in effect (except in areas that are credited as open space (OS) under Activity 420 (Open Space Preservation)—there is no duplicate credit for areas designated as OS because the regulatory standards have no impact where development is prohibited).

Example 431LD-a. Watertown enacted regulations designed to protect new floodplain development, preserve its remaining natural bottomlands, and help recharge groundwater supplies. It requires new subdivisions and other developments greater than five acres to set aside areas that are below the elevation that corresponds to the boundary of its bottomlands (roughly the 25-year flood elevation).

LDC = 75

This provision does not receive open space (OS) credit because buildings are not prohibited in unsubdivided or previously subdivided developments in this area. In other words, a house can be built in the 25-year floodplain on a 20-acre parcel. But, if the owner wants to subdivide that parcel or otherwise develop it more intensely, the designated area must be set aside from filling, paving, or construction of buildings.

The credit will be adjusted by the impact adjustment to reflect areas already built up and areas in the floodplain higher than the designated elevation.

b. Low density zoning (LZ): (Maximum credit: 600 points)

1. Credit points. Credit up to 600 points is given for low density zoning. Credit is given for those portions of the floodplain subject to zoning rules that require a minimum of 1 acre per building or unit. Maximum credit is provided for a 10-acre or larger minimum lot size.

   s = the minimum lot size in acres.

   LZs = 60 x s

Credit is provided for zoning areas to keep them substantially open. This credit is available for undeveloped land within low density zoning districts, as well as for areas developed in accordance with the density requirements. Zoning an area for agriculture, conservation, or large residential lots preserves more open space than allowing more intensive development. For this element, it does not matter why an area is zoned for low density; what counts is the minimum lot size allowed in the zoning district.

The maximum credit for this element is 83% of the credit provided for Activity 420 (Open Space Preservation), because some disruption and damage are expected even at a density of one building per 10 acres.

The credit for low density zoning is based upon the traditional zoning approach of setting minimum lot sizes for different zoning districts. The bigger the lot size, the less dense the floodplain development.

For the credit calculation, density is measured in terms of acres per building. A zoning district with a minimum lot size of 2 acres allows a density of 2 acres per building. For this area, s = 2, and the area would be designated “LZ2” on the Regulatory Floodplain Map.

“s” may have any value from 1.0 to 10.0. That is, the highest allowable density is one building per acre (s = 1.0), and minimum lot sizes larger than 10 acres are credited as 10 acres (s = 10.0).

Where minimum lot sizes are in units other than acres, they must be converted to acres to calculate the credit for this element. A minimum lot size from 40,000 to 43,560 square feet may be counted as 1 acre if the lots are exclusive of rights of way.

2. Requirements.

   (a) A minimum lot size required by a public health ordinance for septic tanks is not counted toward low density zoning.

   (b) Except in areas zoned for single family residential use, lot coverage must not exceed 10% including buildings and fill.

For example, an area with a zoning density of five structures per acre, where development is restricted due to lack of a sanitary sewer, may develop to its full potential if a sewer is installed. An industrial subdivision might allow only one structure per acre, but it might allow 90% lot coverage. This type of development would not meet the objectives of low density zoning credit for the CRS.

Example 431LD.b-1.

A zoning district with 5-acre minimum lots gives:

$s = 5 \quad LZ5 = 60 \times 5 = 300.0$

A minimum lot size of 100,000 square feet gives:

$s = \frac{100{,}000}{43{,}560} = 2.30 \quad LZ2.3 = 60 \times 2.30 = 138.0$

Separate calculations are made for each zoning density, and the credits are added together in Section 433LD.

Example 431LDb-2. See Figure 430LD-1. Watertown allows a minimum lot size of 1 acre in part of its floodplain and a minimum lot size of 10 acres in another portion.

$LZ1 = 60 \times 1 = 60 \qquad LZ10 = 60 \times 10 = 600$

432LD Impact Adjustment

The area(s) affected by land development criteria and low density zoning must exclude areas designated as open space that are receiving OS credit under Activity 420 (Open Space Preservation).

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 (rXXX = 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 - rOS (rXXX = 1.0 - rOS).

As with other regulatory elements, areas for which open space credit (Activity 420) is requested must be excluded from the area credited for land development criteria or low density zoning.

b. Option 2:

1. If new development within part of the area of regulated floodplain (aRF) is subject to the land development criteria, rLDC = 0.25.
2. The community may use the default value rLZs = 0.05 for up to two of its low density zones, provided each zone covers at least 5 acres of the regulatory floodplain.

Option 2 is limited to two zoning densities. Use of the two lowest density (highest “s”) zones will provide the most credit for low density zoning using the default values for rLZs.

Example 432LD.b-1. Rather than map out all the areas affected by its bottomlands protection regulations, and calculate the acreage of the areas affected, Watertown chooses the Option 2 default approach for LDC.

rLDC = 0.25

Example 432LD.b-2. A community has 10-, 5-, and 1-acre zoning districts within its regulated floodplain. Each of these districts covers more than 5 acres. The CRS Coordinator uses Option 2. Since LZ10 gives 600 points, LZ5 gives 300 points, and LZ1 gives 60 points, the community uses rLZ10 = 0.05 and rLZ5 = 0.05 to calculate the credit cLZ.

c. Option 3:

The impact adjustment ratio for each low density zoning district is computed by dividing the area affected by the area of the regulatory floodplain (aRF). Any area for which OS credit is requested must be excluded from the element's area measurements.

a. $rLDC = \frac{aLDC}{aRF}$ b. $rLZs = \frac{aLZs}{aRF}$

If there is more than one low density zoning district within the regulatory floodplain, each must be appropriately designated on the Impact Adjustment Map (see Section 403) and the area of each must be determined in order to calculate the impact adjustments.

Example 432LD.c-1. See Figure 430LD-1. The area of Watertown's LZ1 zoning district is 0.14 square miles: aLZ1 = 0.14. The area of the LZ10 zoning district is 0.11 square miles: aLZ10 = 0.11. aRF = 0.52.

$rLZ1 = \frac{0.14}{0.52} = 0.27$ $rLZ10 = \frac{0.11}{0.52} = 0.21$

433LD Credit Calculation

a. cLDC = LDC x rLDC

b. cLZ = Σ(LZs x rLZs)

c. c430LD = cLDC + cLZ

Example 433LD-1. Using the values calculated in 432LD above, Watertown calculates its credit for this element:

cLDC = LCD x rLDC = 75 x 0.25 = 18.75

cLZ = {(LZ1 x rLZ1) + (LZ10 x rLZ10)}

= {(60 x 0.27) + (600 x 0.21)} = {16.2 + 126.0} = 142.2

c430LD = cLDC + cLZ = 18.75 + 142.2 = 160.95, which is rounded to 161

During the verification visit, the ISO/CRS Specialist visits several areas of low density zoning in Watertown's floodplains. All of the areas visited appear to comply with the zoning density on the zoning maps.

The value for cLZ is used in Example 433-2.

434LD Credit Documentation

The community must submit the following:

a. The ordinance language that adopts the land development criteria or low density zoning standard. The appropriate acronym(s) (LDC, LZ1, LZ5, etc.) must be marked in the margin of the sections that pertain to the element. 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 of the application or modification 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 calculates impact adjustment ratios using Option 3 (432LD.c) The Impact Adjustment Map prepared in accordance with Section 403. Each area listed in Section 431LD for which credit is being requested must be designated on the Impact Adjustment Map and in the map's key.

Areas subject to low density zoning are designated as "LZs" on the Impact Adjustment Map (see Section 403), where the "s" designates the minimum lot size (in acres). An area of 5-acre zoning would be designated "LZ5"; an area in which one structure is allowed on a 100,000-square-foot lot would be designated "LZ2" (100,000 square feet is 2.30 acres).

c. An explanation of the procedures followed for enforcement of the regulatory standard.

d. Examples of developments constructed in accordance with the ordinance language.

During the verification visit, the ISO/CRS Specialist will need to see site plans and final plats that will document how the land development criteria or zoning density is applied. The ISO/CRS Specialist will also visit a sample of new developments to verify that they have been constructed in accordance with the approved plans.

435LD For More Information

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. More information on planning and regulatory techniques to preserve floodplain open space can be found in *Subdivision Design in Flood Hazard Areas,* Planning Advisory Service Report # 473. Copies can be ordered for $32 from

American Planning Association
122 South Michigan Ave, Suite 1600
Chicago, IL 60603
(312) 431-9100

c. Often local governments and regional agencies have guidebooks for some of the planning or regulatory tools encouraged by this activity, such as low-impact development design manuals and handbooks on best management practices (BMPs).

440 FLOOD DATA MAINTENANCE

Summary of Activity 440

441 Credit Points. There are four elements in this activity for a maximum of 231 points (excluding special hazards credit).

a. Additional map data (AMD): Up to 121 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. Elevation reference mark maintenance (ERM): Up to 90 points are provided if a community maintains its elevation reference marks.

c. Erosion data maintenance (EDM): Points are provided for maintaining coastal erosion data as described in *CRS Credit for Management of Coastal Erosion*.

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 is applying for credit for a geographic information system that meets the Federal Emergency Management Agency's (FEMA's) geographic information system mapping criteria under Section 441.a.2(h)] A computer disk with part of the geographic information system data base.

c. [If the community calculates impact adjustment factors using Option 3 (Section 442.c)] The Impact Adjustment Map discussed in Section 403.

d. Copies of the digitized mapping, parcel records, and/or overlay maps, elevation reference mark data, erosion data, shoreline erosion records, and/or old FIRMs, as appropriate.

e. [If the community is applying for credit for maintaining elevation reference marks (ERM)] A copy of the master list of elevation reference marks and documentation that shows when they are inspected and repaired or replaced.

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

f. 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 frequently updated 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 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 elevation reference marks 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 elevation reference marks makes it easier and less expensive for developers and property owners to determine ground, floor, and base flood elevations for construction and 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: 231 points.

a. Additional map data (AMD) (Maximum credit: 121 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).

(d) Credit for including the special flood-related hazards is only available if the community is receiving credit for regulating the hazard (i.e., the community must receive credit under Section 430SH).

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 CRS publication appropriate to that hazard (see Appendix E). Those publications show 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 the first item 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) 8, for showing the location of buildings (a database management program must show whether the primary building on the lot is in the regulatory floodplain);

   (c) 8, for showing floodways (a database management program must show whether either the parcel or the primary building is in the floodway);

   (d) 8, for showing base flood elevations;

   (e) 8, 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 special flood-related hazard areas (a database management program would show whether the parcel is subject to any of these hazards);

   (h) either:

      (1) 15, if the system meets FEMA's geographic information system mapping criteria and FEMA contributed to the community's system; or

(2) 25, if the system meets FEMA's geographic information system mapping criteria and FEMA did not contribute to the community's system;

(i) 8, for including updated floodplain data in the tax assessment data base; and

(j) 8, for including overlays or layers for all FIRMs in effect after the date of the community's application to the CRS.

(k) 8, for other overlays or databases used for regulation or mitigation programs.

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.

FEMA's geographic information system mapping criteria are explained in *National Flood Insurance Program Standards for Digital Flood Insurance Rate Maps* and *Flood Insurance Study Guidelines and Specifications for Study Contractors* (see Section 445.a). The ISO/CRS Specialist provides instructions on what materials are needed to verify that the geographic information system meets FEMA's criteria.

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. Elevation reference mark maintenance (ERM) (Maximum credit: 90 points)

This element credits a program that maintains elevation reference marks so surveyors can find them and can depend on them to be accurate.

1. Prerequisites:

(a) The reference marks must be in the same datum as the base flood elevations on the community's Flood Insurance Rate Map or a datum that is readily convertible to the FIRM's datum.

(b) The community must have a master list of the reference marks and clear descriptions of their locations in a publication that is readily available for

surveyors and other interested parties. This may be a publication kept by another agency and there may be a reasonable charge for it.

2. Credit points: Credit is provided under one of two approaches to maintaining elevation reference marks:

   (a) (Maximum credit: 90 points) If the community initiates the maintenance of elevation reference marks by periodically checking their location and elevation, then ERM =

   (1) $\frac{120}{YCM}$ if the elevation reference marks are of a type similar to those shown on the FIRM; or

   (2) $\frac{150}{YCM}$ if the elevation reference marks are permanent monuments; or

   (3) $\frac{180}{YCM}$ if the elevation reference marks are tied in to the National Geodetic Reference System.

   YCM = the number of years between checks of every elevation reference mark used in the community's regulatory program The minimum value for YCM is 2 (i.e, checks are run at least every two years). There is no credit if YCM is greater than 5.

   (b) (Maximum credit: 30 points) If the community maintains, replaces and/or adds to its elevation reference marks whenever it is notified that one is missing or otherwise unusable, then ERM =

   (1) 20, if the elevation reference marks are of similar type to those shown on the FIRM; or

   (2) 25, if the elevation reference marks are permanent monuments; or

   (3) 30, if the community has at least three elevation reference marks listed in the National Geodetic Reference System; or

   (4) 30, if every developable site in the Special Flood Hazard Area is within ½ mile from a permanent monument.

Communities subject to subsidence are not eligible for credit under the second approach (Section 441.b.2(b)).

"Permanent monuments" are engraved metal discs at least 2" in diameter set in concrete or similar markers that are recognizable, durable, and immovable. Chiseled squares in sidewalks, parts of fire hydrants, nails in telephone poles, "PK nails" in pavements, etc. are not "permanent monuments."

Under the first approach, if the reference marks are permanent monuments and the community confirms the location and elevation of every mark every three years, ERM = 150 ÷ 3 = 50.

Credit may be received for maintaining the elevation reference marks shown on the community's FIRM or for maintaining at least the same number of elevation reference marks as there are on each panel of the FIRM. For example, if a FIRM panel shows eight elevation reference marks, the community must maintain a total of at least eight elevation reference or bench marks at the datum of the FIRM or at a datum that can be equated to the FIRM datum.

Because the maintenance of elevation reference marks is critical in areas with land subsidence, full credit (90 points) is given only if a community checks the location and elevation of each elevation reference mark at least every two years.

c. Erosion data maintenance (EDM)

Credit for maintaining coastal erosion data is described in *CRS Credit for Management of Coastal Erosion*. 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 geographic information system, digitized parcel data, or overlay map. More information and credit point calculations, can be found in *CRS Credit for Management of Coastal Erosion* (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 Flood Insurance Rate Maps (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), 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

The area included in AMD (aAMD) is adjusted according to its portion of the area of regulatory floodplain (aRF):

a. Option 1:

If the data for the entire regulatory floodplain have been entered into the system or included on the overlay map, rAMD = 1.0.

This activity is usually implemented throughout the floodplain. Where this is the case, the community can use Option 1 to determine the impact adjustment ratio for AMD.

b. Option 2:

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.

c. Option 3:

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):

$$rAMD = \frac{aAMD}{aRF}$$

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 geographic information system, 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 ERM or FM.

There is no credit for maintaining fewer elevation reference or bench marks than the number on the community's FIRM. Therefore, there is no impact adjustment for ERM. If the program covers fewer elevation reference marks than the number provided on the FIRM, then ERM = 0.

443 Credit Calculation

a. cAMD = AMD x rAMD

b. c440 = cAMD + ERM + EDM + FM

Example 443.b-1. As noted above, AMD for Floodville = 48 and rAMD = 1.0.

cAMD = 48 x 1.0 = 48

Floodville has no coastal erosion areas: EDM = 0.

The City Council adopted a policy to replace any missing elevation reference marks as needed. Floodville does not experience subsidence, ERM = 20.

c440 = cAMD + ERM + EDM + FM = 48 + 20 + 0 + 0 = 68

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 object 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 is applying for credit for a geographic information system that meets FEMA's geographic information system mapping criteria under Section 441.a.2(h)] A computer disk with a portion of the geographic information system data base.

The computer disk will be used to verify that the community's geographic information system meets FEMA's geographic information system mapping criteria. If FEMA cannot read the data base, the community will not receive the 15 or 25 credit points under Section 441.a.2(h). More information on this can be found in the two FEMA publications listed in Section 445, and additional instructions will be provided by the ISO/CRS Specialist after the application is submitted.

c. [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 applied must be shown on the Impact Adjustment Map and in the key.

d. Copies of the digitized mapping, parcel records, overlay maps, shoreline erosion records, and/or old FIRMs, as appropriate.

If the community has a geographic information system 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).

e. [If the community is applying for credit for maintaining elevation reference marks (ERM)] A copy of the master list of elevation reference marks and documentation that shows when they are repaired or replaced.

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

f. Identification of any reference marks that appear on the FIRM that were found to be missing or inaccurate.

If any elevation reference marks are found to be listed incorrectly, the community should provide FEMA with the correct elevations or information on other reference marks. Otherwise, revised FIRMs will continue to show the incorrect information.

445 For More Information

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 Study Contractors, FEMA-37, 1999 or http://www.fema.gov/mit/tsd/dl_scg.htm.

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 elevation reference marks 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 your state emergency management agency's training office.

e. Communities may check on past FIRMs with the FEMA Map Coordination Contractors. These contractors may have information on techniques used and cost sharing for past FEMA-funded studies.

   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.

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. Stormwater management master plan (SMP): Up to 225 points are provided for regulating developments according to a stormwater 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 each element are adjusted in one of three ways.

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 have the following available to verify implementation of this activity:

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 SMP] Certification and appropriate pages from the stormwater 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.

i. Development and building permit records that demonstrate enforcement of the regulations.

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 stormwater 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.
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.

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:

SMR = SZ + DS + PUB.

If SZ = 0, then 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, regardless of size;

   (b) 20, if all development is regulated except single-family residences 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;

   (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 apply to 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 (SZ = 15) and residential developments larger than 5 acres (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)

   PUB is determined by the nature of public maintenance of stormwater facilities. Credit is provided if the community assumes maintenance responsibility for all private facilities or if the community inspects all private 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.

A community can receive PUB credit through any one or combination of three ways:

1. The community inspects all new stormwater management facilities at least annually and orders maintenance when needed. If the owner fails to perform the maintenance, the community does the job and bills the owner;

2. The owners of all new stormwater management facilities perform the maintenance and their engineers certify at least annually to the community that it has been done; or

3. All new stormwater management facilities (including basins built by private developers) are required to be deeded to the community, and the community 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:

PUB = 110

Watertown's other values were calculated above: SZ = 5 and DS = 70.

SMR = SZ + DS + PUB = 5 + 70 + 110 = 185

b. Stormwater management master plan (SMP) (Maximum credit: 225 points)

1. Prerequisites:

(a) The community must have adopted a stormwater management 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.

2. SMP = the total of the following points. Credit must be received for item (a).

(a) 80 if the stormwater management 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 stormwater management plan prevents damaging increases in peak flows at all points within its watershed(s) and downstream, it will receive this credit.

(c) 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.

(d) 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.

(e) 10, if the plan prohibits development, alteration, or modification of existing natural channels.

(f) 10, if the plan requires that channel improvement projects use natural or "soft" approaches rather than gabions, rip rap, concrete, or other "hard" techniques.

(g) 20, if the plan was prepared in coordination with or as a part of the community's floodplain management plan credited under Activity 510.

A stormwater master plan is the result of a hydrologic and hydraulic study of the watershed, usually under both existing conditions and future development conditions with different management scenarios. It usually includes recommendations for a set of management controls and/or construction projects to solve existing flooding problems and to prevent the development of new problems.

Credit is provided if the community develops and implements surface water runoff regulations through a stormwater 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, providing 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 SMP for management of storms smaller than the 25-year storm).

Additional points are provided under subsections (a)—(g).

(a) Forty additional points are provided 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 in larger basins. 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.

(b) Twenty-five additional points are provided 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) 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.

(d)—(f) 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.

(g) 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 SMP credit, but a stormwater 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 stormwater master plan, and if references in the stormwater master plan demonstrate that it is intended to help implement the Floodplain Management Plan; and/or

- Hydrologic output from the stormwater 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);

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.

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.d-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.

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-2. 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. BMPs 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 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.f-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. Stormwater management master plan (SMP): If the stormwater management master plan regulates all development within all of the watersheds that affect the community, rSMP = 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 stormwater management plan. aSMP must be included in aSMR. If all regulated areas are included in the stormwater management plan, rSMP = 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. Stormwater management master plan (SMP): If the stormwater management master plan does not regulate all development within all of the watersheds that affect the community, it may use the default value rSMP = 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. Stormwater management master plan (SMP): If the stormwater management 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 rSMP:

   $$rSMP = \frac{aSMP,}{aW} \text{ where}$$

   aSMP = the area covered by a stormwater management 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 aSMP 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 aSMP 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 stormwater management master plan.

In order to use Option 3 and determine aSMR, aW, and aSMP, 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 aSMP.

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 x rSMR

b. cSMP = SMP x rSMP

c. c450 = cSMR + cSMP + FRX + ESC + WQ

Example 453-1. Watertown's credit points are discussed above:

SMR = 185, rSMR = 0.25, cSMR = 185 x 0.25 = 46.25

FRX = 58.5

WQ = 25

c450 = 46.25 + 0 + 58.5 + 25 = 129.75 = 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.

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).

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).

NOTE: *The community's staff may be asked to complete a questionnaire on its stormwater management program to facilitate verification of this activity.*

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 SMP credit under Section 451.b] Copies of the pages of the stormwater 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; and

   4. [Required if the community is applying for credit for Section 451.b.2(d)—(f)] How the plan utilizes or protects the existing natural stormwater features within the watershed.

   5. [Required if the community is applying for credit for Section 451.b.2(g)] A statement by the community official responsible for implementation of the stormwater 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.

A stormwater management plan is usually a complex and bulky document. There may be 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.

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 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 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 (452.a) or Option 3 (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 Options 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 stormwater management plan (aSMP) 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 procedures 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.

455 For More Information

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

500 FLOOD DAMAGE REDUCTION ACTIVITIES

This series of activities addresses flood damage to existing buildings. It complements the previous series that dealt with preventing damage to new development. Recognized damage reduction measures include acquiring, relocating, or retrofitting existing buildings and maintaining drainageways and retention basins. As discussed in Section 504, the Community Rating System (CRS) does not provide credit for structural flood control projects.

Credit points for Activities 520 and 530 are adjusted according to the number of buildings affected. See Sections 301 through 303 for a discussion of impact adjustment ratios based on building counts.

Sections 501 through 503 and Activity 510 (Floodplain Management Planning) are mandatory for all or some repetitive loss communities. See Sections 501 and 502 for a discussion of the applicability of these requirements.

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501 The Repetitive Loss List

The Federal Emergency Management Agency (FEMA) produces a list of repetitive loss properties within each National Flood Insurance Program (NFIP) community. This list must be obtained through the FEMA Regional Office by any community considering applying for the CRS.

As part of its application and cycle verification, the community must review the list for accuracy, correct addresses, whether the properties are actually in the community's corporate limits, and whether the insured buildings have been removed, retrofitted, or otherwise protected from the cause of the repetitive flooding. The result of this review is updated repetitive loss information, which is recorded on AW-501, Repetitive Loss Update Worksheet.

A community with repetitive losses must submit the appropriate worksheet page or activity worksheet for Section 501, and either attach changes to the list using the AW-501, or certify that each address has been checked and that no updates are necessary. Failure to submit this material will result in the application being returned. If the community does not conduct the review of the list at cycle verification, it will lose its CRS credit for addressing its repetitive loss properties.

Each year, FEMA produces a list of properties for which two or more claims of at least $1,000 have been paid by the NFIP within any 10-year period since 1978 (e.g., two claims during the periods 1978–1987, 1979–1988, etc.). The list includes the property address, the dates of the claims, and, usually, the owner's name. It is printed on a form, AW-501, which can be ordered through the ISO/CRS Specialist or the FEMA Regional Office (see Appendix A) for any NFIP community. Before applying for the CRS, a community must obtain its latest repetitive loss list.

The community needs to make sure it has the latest list before it submits its application or modification to the CRS. It is the community's responsibility to review the list for accuracy and updating. The community must note the following situations in which the form should be updated:

- The property is not in the community. The property may be outside the community's corporate limits, it may be in another city, or it may have been annexed into another community. If it can be determined which community the property belongs in, it will be removed from the list.

- The property has subsequently been protected from the types of events that caused the losses. Buildings that have been acquired, relocated, retrofitted, or otherwise protected from frequent floods are not counted in determining the community's CRS requirements.

- The property is protected from damage by the base flood. For example, the community may demonstrate that the building is elevated or floodproofed above the base flood elevation but was flooded by higher flood levels. If the property is outside the Special Flood Hazard Area, the community may show that all of the repetitive losses were caused by events with recurrence intervals of over 100 years (e.g., two 200-year storms).

Although it is hoped that the community will be able to locate all properties on the list and determine why they were flooded, it may be impossible to confirm every one. Updated information is noted on the form, AW-501, for each property that the community was able to locate.

Activity worksheets AW-501 (Repetitive Loss Update) and AW-502 (Repetitive Loss Requirements) (or the equivalent page from the *CRS Application*) are submitted with the community's CRS application or modification. FEMA reviews the revisions submitted by the community. If a property is not in the community, it will not be removed from the list unless the community in which the property does belong can be determined.

Each year, a new set of AW-501 update worksheets is sent to each CRS community for informational purposes. It will reflect the community's changes and any new properties that are added due to recent floods. Except during cycle verification and as specified in Section 502.b, a community is not required under the CRS to respond to each year's new list. However, the list can be a valuable planning tool and source of information about the location and extent of flooding within the community.

502 Repetitive Loss Category

a. For CRS purposes, there are three categories of repetitive loss communities based on the number of properties on the UPDATED repetitive loss list (i.e., after the changes and updates have been reported and accepted by FEMA):

   1. Category A: A community with no repetitive loss properties.
   2. Category B: A community with at least one (1), but less than ten (10) repetitive loss properties.
   3. Category C: A community with ten (10) or more repetitive loss properties.

Every community with one or more repetitive loss properties on FEMA's original list must submit a Repetitive Loss Requirements activity worksheet, AW-502 (or the equivalent page from the *CRS Application*), if it wants to be a CRS Class 9 or better. Additional requirements depend on the community's repetitive loss category, which is determined by the number of repetitive loss properties AFTER the applicant has updated the repetitive loss property information. Properties that have been mitigated or that are shown to be in another community are not counted when the repetitive loss category is determined.

- A Category A community has no special requirements except to submit information needed to update the repetitive loss list.
- A Category B community must review and describe its repetitive loss problem, prepare a map of the repetitive loss area(s), and undertake an annual outreach project to the repetitive loss area(s). This is explained in Section 503. A copy of the outreach project is submitted with each year's recertification.
- A Category C community must do the same things as a Category B community AND prepare a floodplain management plan for its repetitive loss area(s). The plan requirements are explained in Activity 510 (Floodplain Management Planning).

b. A community's repetitive loss category may change over time as a result of flood damage reduction measures implemented by the community or as a result of floods that add new insurance losses to the FEMA list.

A CRS community has no immediate need to take action as a result of a change in its repetitive loss category except as follows:

1. When it applies for or modifies its application for Activity 510 (Floodplain Management Planning).
2. When it submits a modification that will result in an increase in its CRS classification by two or more classes.
3. When it is slated for a complete cycle verification of its program. Cycle verification visits are conducted five years after the original application year for Class 6–9 communities, and every three years for Class 1–5 communities.

The last two situations are explained in more detail in Sections 215 and 234. They require that a community submit activity worksheets and documentation for all of its activities, including Activity 510.

c. If a community becomes a Category B community during the year of its cycle verification (see Section 234), it must begin the required outreach project during the following year. If a community becomes a Category C community during the year of its cycle verification, it has until October 1 of the following year to prepare and adopt the required floodplain management plan for its repetitive loss areas.

503 Repetitive Loss Area Outreach Project

Because repetitive flooding accounts for approximately 33% of all flood insurance claims payments, an outreach project is required for any community in repetitive loss category B or C. These communities must identify and describe their repetitive loss problem areas and initiate an outreach project to those areas.

In addition to the outreach project, a community in Category C must adopt a floodplain management plan for its repetitive loss areas. The plan must be submitted with the community's *CRS Application* under Activity 510 (Floodplain Management Planning).

If a Category B or C community fails to supply a copy of each year's outreach project with its recertification, or if a Category C community fails to submit its annual floodplain management plan evaluation report with its recertification, it will revert to a Class 10.

Approximately 4 million buildings are insured by the National Flood Insurance Program (NFIP), but only a tiny fraction of them (less than 2%) account for 33% of the flood insurance claims paid since 1978. This is because these few properties have been flooded more than once, and some of them have been flooded numerous times. The outreach project is mandatory for repetitive loss communities because such a small number of properties has such a big impact on the NFIP. Communities with 10 or more such properties (i.e., Category C communities) must also prepare plans to address their repetitive loss problems.

Although there is no credit for the outreach project, every community with at least one repetitive loss property must undertake it to be eligible to participate in the CRS. Failure to include the items listed in this Section 503 with an application or modification will prevent a review of the community's submittal.

A Category B or C community may be able to demonstrate that it has no repetitive loss properties. If so, the updates must be noted on the worksheet, AW-501. If all of the properties can be removed from the list by updating (see Section 501), then the community will be treated as a Category A community. In that case, it does not need to implement the items in this section.

In its CRS Application, a community with one or more property on the updated FEMA list (i.e., a category B or C community) must submit AW-502 and:

a. A map of its repetitive loss areas. The repetitive loss areas must include the properties on the repetitive loss list obtained from FEMA and adjacent properties with the same or similar flooding conditions.

b. A description of the cause(s) of the repetitive flooding.

The community is expected to plot all of the properties to the best of its ability. In some cases, such as those in which the address consists of a rural route or box number, a property will be unplottable. All that is needed is for the general area of the property to be located, e.g., the 400 block of a street. The objective is to plot repetitive loss AREAS, that is, those areas with buildings that have been flooded two or more times over a 10-year period since 1978. The repetitive loss areas will include buildings (including uninsured ones) that were subject to the same flood as those on the FEMA list.

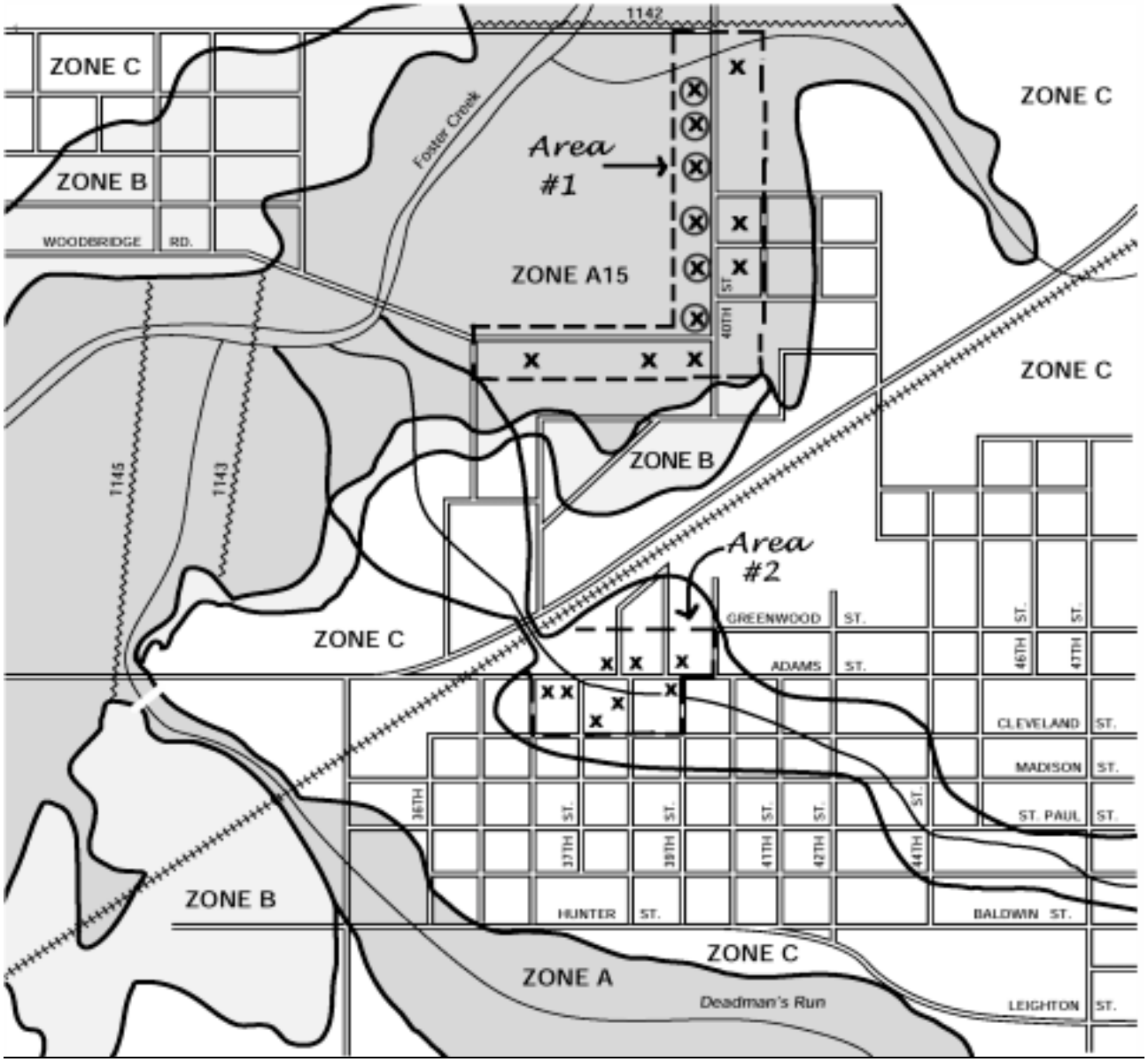
The description of the causes of the repetitive flooding should be brief and general. For example, it might include:

- The name of the stream and the recurrence interval of the flood, if known;
- Sewer backup or inadequate drainage system; or
- Similar descriptions of causes of flood damage.

Example 503-1. (See Figure 500-1.) Floodville received its repetitive loss list from FEMA. Twenty properties were listed and the City Planner was able to plot the general location of each. Floodville is a Category C community. Figure 500-1 shows that the City has two repetitive loss areas.

Area #1: Twelve of the properties had been flooded by ice jam floods in the late 1970s and early 1980s. The City drew a repetitive loss area boundary around an area that has been flooded by Foster Creek ice jams almost every other year. Six of the listed properties were purchased, two under FEMA's Section 1362 program in 1986. The City's Foster Creek Park was expanded to the east to include the newly vacated lots. However, there are still 25 buildings remaining in Area #1 that have repeatedly been flooded.

Area #2: The other eight properties are in an area that has been flooded several times because of a railroad culvert that is too small. The culvert was properly sized when built 50 years ago, but new development upstream has increased runoff and recent storms have caused floods. The City had the area studied and is applying for credit for the study under Activity 410 (Additional Flood Data). A total of 22 buildings in Area #2 have been flooded.



Repetitive Loss Area Map

X = Property on FEMA's repetitive loss property list

⊗ = Repetitive loss property that has been purchased and removed.

◯ = Repetitive loss area

Figure 500 1. Floodville's repetitive loss area map.

c. A category B or C community must implement an annual outreach project to the properties in the mapped repetitive loss areas and include a copy of the project with its application.

1. The outreach project must advise the recipient of three things;

   (a) that the property is in or near an area subject to flooding,

   (b) property protection measures appropriate for the flood situation, and

   (c) basic facts about flood insurance.

2. The outreach project must be sent to all properties in the repetitive loss AREAS, not just the properties on the FEMA list. This may be done by one of three ways:

   (a) An outreach project that is distributed each year and that reaches the properties in the repetitive loss areas. This project may also be submitted for credit as an additional outreach project (OPA) under Activity 330,

   (b) An outreach project pursuant to the public information strategy (OPS) credited in Activity 330, provided that the public information strategy identifies the target audience and discusses the best way to advise that audience about the hazard, property protection, and flood insurance, or

   (c) An outreach project that does the same as items (a) or (b), above, but is not credited under Activity 330. The materials must be distributed each year.

d. A category B or C community must include a copy of each year's outreach project with its annual recertification.

More information on outreach projects can be found in Activity 330 (Outreach Projects). In many cases, the community can combine this repetitive loss area outreach project with an outreach project credited under Activity 330.

An annual outreach project to floodplain properties (OPF) in Activity 330 (Outreach Projects) can satisfy this requirement, provided that (1) it covers the flood insurance and property protection topics as described in Section 331; and (2) it reaches all properties in the repetitive loss areas, including those not in the SFHA. If it does not qualify for OPF, the outreach project to the repetitive loss areas may qualify for credit as an additional outreach project (OPA) under Activity 330.

This information is submitted on AW-502 or its equivalent page in the *CRS Application*.

504 National Flood Insurance Reform Act of 1994

This Act requires "If a community has received mitigation assistance under Section 1366 [the new Flood Mitigation Assistance Program], the credits shall be phased in a manner, determined by the Director, to recover the amount of such assistance provided for the community."

> When the ISO/CRS Specialist visits a community that received funds from the Flood Mitigation Assistance Program, those funded projects that are related to CRS credit will be reviewed, and the scores pro-rated based on FEMA's share of the cost.

Generally, this will be limited to Activity 520 (Acquisition and Relocation) and 530 (Flood Protection), the two activities most likely to be funded.

NOTE: *This is a statutory requirement that only applies to the Flood Mitigation Assistance program, not to other FEMA-funded financial assistance programs.*

Example 504-1. A community applies for credit under Activity 520 (Acquisition and Relocation) for having removed 20 buildings from the floodplain. Five of those buildings were acquired with a 75% grant from the Flood Mitigation Assistance Program.

The ISO/CRS Specialist will calculate the score based on 25% credit for the five buildings and full credit for the other 15. If the community can demonstrate that there was a higher local cost-share, the points will be adjusted accordingly.

510 FLOODPLAIN MANAGEMENT PLANNING

Summary of Section 510

Credit is provided for preparing, adopting, implementing, evaluating, and updating a comprehensive floodplain management plan. 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 309 points are provided for two 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.

Step	Max points
1. Organize to prepare the plan	10
2. Involve the public	72
3. Coordinate with other agencies	18
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	35

b. 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.

b. Under Option 2, if the floodplain management plan covers all of the community's repetitive loss areas or at least 25% of its known flood hazard areas, the impact adjustment ratio is 0.25.

513 Credit Calculation.

The credit for the floodplain management plan (FMP) is the total of the credit points for the 10 steps. If the credit for any one of the 10 steps is 0, then FMP = 0. The credit for this activity is FMP multiplied by the impact adjustment ratio plus the credit for HCP.

514 Credit Documentation. The community must submit the following.

a. A copy of the floodplain management plan with the credited elements noted in the margin or explained in an attached memo.

b. Documentation showing how the public was involved in preparing or reviewing the plan.

c. 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.

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

d. An annual evaluation report on progress toward implementing the plan's objectives.

e. 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 on this activity.

510 FLOODPLAIN MANAGEMENT PLANNING

NOTE: *A separate publication,* ***Example Plans****, has a detailed discussion of the requirements of this section, 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 all possible activities are reviewed and implemented so that the most appropriate solutions are used to address the hazard.
- Ensure that activities are coordinated with each other and with other community goals, objectives, and activities, preventing conflicts and reducing 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.

Programs that are based on a comprehensive floodplain management or hazard mitigation plan address all the community's flood problems more effectively. Therefore, the Community Rating System (CRS) provides credit for preparing, adopting, implementing, evaluating, and updating a comprehensive floodplain management plan. 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.

A Category C repetitive loss community must prepare a floodplain management plan that covers at least all of its repetitive loss areas.

Floodplain management planning that covers all of a community's known flood hazards is encouraged. However, if the planning is for less than all flood problems (e.g., just the repetitive loss areas), the credit points are reduced by using the impact adjustment (see Sections 512 and 513).

In order to maintain the credit for this activity, the community must annually evaluate progress toward implementing the plan and submit an evaluation report with its annual CRS recertification. It must prepare an update to its plan at least every five years.

Because each community is different, each floodplain management planning effort will be different. The objective of this credit is to ensure that a process was followed that selected the best measures for the community and its hazards. Therefore, the key elements for crediting a floodplain management plan focus on the process used to prepare it. A plan by another name, such as a post-flood or multi-hazard mitigation plan, could receive this credit if it was prepared in accordance with the process explained in Section 511.

The floodplain management plan must have been developed using a standard, step-by-step, planning process. To receive credit for a floodplain management plan, the community's process must include each of 10 steps that are explained Section 511:

In 2001, FEMA promulgated hazard mitigation planning regulations pursuant to the Disaster Mitigation Act of 2000 (44 *CFR* 201.6). The 10-step CRS process is consistent with those regulations, which identify four essential parts to mitigation planning. The 10 steps are organized in the table below with the four mitigation planning requirements.

Disaster Mitigation Act Planning Regulations (44 *CFR* 201.6)	**CRS Planning Steps**	**Maximum Points**
Planning process		
201.6(c)(1)	1. Organize	10
201.6(b)(1)	2. Involve the public	72
201.6(b)(2) & (3)	3. Coordinate	18
Risk assessment		
201.6(c)(2)(i)	4. Assess the hazard	20
201.6(c)(2)(ii) & (iii)	5. Assess the problem	35
Mitigation strategy		
201.6(c)(3)(i)	6. Set goals	2
201.6(c)(3)(ii)	7. Review possible activities	30
201.6(c)(3)(iii)	8. Draft an action plan	70
Plan maintenance		
201.6(c)(5)	9. Adopt the plan	2
201.6(c)(4)	10. Implement, evaluate, revise	35
	Total	294

Although the planning process must follow the 10-step process, the plan document does not need to be organized according to these 10 steps. However, the community must submit the plan with its submittal for credit and identify where these steps were covered. Steps 1, 4, 5, 6, 7, 8 and 10 must appear in the plan document. The other three steps can be in the plan document or they may be explained in a separate memo from the community or the plan's author. The location of each step that is covered in the plan document must be clearly marked.

A plan developed for the CRS can fulfill the mitigation planning prerequisite for a grant from FEMA's Flood Mitigation Assistance (FMA) Program and Hazard Mitigation Grant Program (HMGP), which also provide funds to communities to help prepare such plans if they address the full range of natural hazards affecting the community.

Additional items needed to meet FEMA's requirements for these other programs are noted in this activity. There may be other conditions set by the state office that approves plans for the FMA and HMGP grants. It is recommended that planners check with the appropriate state office(s) before beginning the planning work. These programs are administered by the state hazard mitigation office, usually located in the state emergency management agency.

The U.S. Army Corps of Engineers also has a new floodplain management planning requirement. Communities receiving funding from the Corps for flood protection projects are required to prepare a floodplain management plan following a procedures similar to this activity's 10-step process. The Corps guidance specifically states that CRS plans may be sufficient for that requirement (Policy Guidance Letter No. 52). For more information, contact the District Office of the Corps of Engineers.

Other federal programs also encourage comprehensive floodplain management planning, including FEMA's Project Impact, the Fish and Wildlife Services' Habitat Conservation Plans, the Natural Resources Conservation Service's watershed planning, and the Environmental Protection Agency's multi-objective management planning. A community's flood protection planning efforts should include contacting these programs and coordinating with them as much as possible.

One other note about planning: planning is a comprehensive "future-oriented" approach that determines how a community will deal with its flooding problem(s) and protect the natural and beneficial functions of its floodplain. Planning guides the community through its problem(s) by reviewing options for solving the problem(s) and identifying the most appropriate solutions.

An ordinance is not a plan. An ordinance sets standards for land development and other activities. Planning may include a review of land development standards and procedures, but it should also cover a much broader range of activities as noted in Figure 510-1.

511 Credit Points

Maximum credit for floodplain management planning: 309 points

a. Floodplain management planning (FP) (Maximum credit: 294 points)

The floodplain management plan must have been developed using the standard 10-step planning process. TO RECEIVE CREDIT UNDER THIS ACTIVITY, THE PLANNING PROCESS MUST RECEIVE SOME CREDIT FOR EACH OF THE 10 STEPS LISTED BELOW.

Floodplain management planning (FMP) = the total of the following points credited for each of the 10 steps.

Planning Process

1. Organize to prepare the plan (Maximum credit: 10 points). The credit for this step is the total of the following points, which are based on how the community organizes to prepare its floodplain management plan:

   (a) 2, if the planning process is under the supervision or direction of a professional planner;

   (b) 6, if the planning process is conducted through a committee composed of staff from those community departments that will be implementing the majority of the plan's recommendations;

   (c) 2, if the planning process and/or the committee are formally created or recognized by action of the community's governing board.

   The plan document must discuss how it was prepared, who was involved in the planning process, and how the public was involved during the planning process. (REQUIRED)

   When a multi-jurisdictional plan is prepared, at least one representative from each community seeking CRS credit must be involved on the planning committee that is credited under item (b).

To receive credit, the planning process must be consistent with these 10 steps and receive credit points for each or them. For some steps, such as step 1, the community may show that it implemented at least one of the listed credit items. For other steps, specific items are required at a minimum. Required items are noted with "(REQUIRED)" after them.

The plan itself or a separate explanation needs to document how the community organized to prepare the plan. If the planning committee includes representatives from the public and other stakeholders, additional credit is provided in the next step.

A "professional planner" may be a community employee, consultant, or an advisor from a state agency or regional planning agency. He or she does not have to be a member of the American Institute of Certified Planners (AICP). Someone with an urban planning degree or someone with land use planning, community planning, or urban renewal experience may be a professional planner. However, the CRS will not recognize a building official, engineer, or other non-planner acting alone as a professional planner.

A planning committee is strongly recommended. By involving those who will be most affected by the planning, the community will get a more realistic product that will have a much better chance of being adopted and implemented. Community departments that should be represented on the committee include:

- Building department/code enforcement
- Land use planning/zoning
- Emergency management/public safety
- Environmental protection/public health
- Engineering
- Public works
- Public information
- Parks/recreation

Two points are provided if the community's governing board (e.g., the city council) formally recognizes the planning process. This can be a motion that is reflected in the minutes. However, a preferred method is a formal resolution that designates who is responsible for preparing the plan and specifies a completion deadline. If a committee with representatives from the public is used, the resolution should identify the members, who acts as chair, and how staff support is provided.

Planning Process

2. Involve the public (Maximum credit: 72 points). The term "public" includes residents, businesses, property owners, and tenants in the floodplain and other known hazard areas. The credit for this step is the total of the following points based on how the community involves the public during the planning process. To receive credit for this step, the process must include Item (a).

   (a) 2, for inviting the public to comment during the planning process and for holding at least one public meeting to obtain input on the draft plan. The meeting must be at the end of the planning process, at least two weeks before submittal of the recommended plan to the community's governing body. (REQUIRED)

   (b) 8, if one or more public meetings are held in the affected area(s) at the beginning of the planning process to obtain public input on the natural hazards, problems, and possible solutions.

   (c) 4, if public information activities are implemented to explain the planning process and encourage input to the planner or planning committee.

   (d) 4, if questionnaires are distributed asking the public for information on their natural hazards, problems, and possible solutions. The questionnaires must be distributed to at least 90% of the floodplain residents.

   (e) 4, if written comments and recommendations are solicited from neighborhood advisory groups, homeowners' associations, parent-teacher organizations, the Chamber of Commerce, or similar organizations that represent the public in the affected area(s).

(f) 26, if the planning process is conducted through a planning committee that includes members of the public. If this is the same planning committee credited under step 1, items (b) and (c), at least one half of the members must be representatives of the public, preferably from the floodprone areas. The committee must hold a sufficient number of meetings that involve the members in planning steps 4 through 9 (e.g., at least one meeting on each step).

(g) 24, if the planning committee credited in item (f), above, includes other stakeholders in the community, such as business leaders, civic groups, non-profit organizations, and major employers.

The term "public" as used in items (a) and (f) includes floodplain residents and the owners or managers of floodprone properties. The term "stakeholders" as used in item (g) includes business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, landowners, and developers and others from outside the floodplain. The involvement of community stakeholders is encouraged because their activities can impact natural hazards and they can participate in or support the recommendations of the floodplain management plan.

The credit points show the importance of involving the public in the planning process, especially as members of the planning committee. The highest number of points for this activity are provided for having a planning committee responsible for floodplain management planning. At least half of its members must be from the public and stakeholders (e.g., residents, businesses, and property owners in the known flood hazard areas as well as non-profit organizations and civic groups from other parts of the community). The rest should be staff from the local government and organizations that will likely be responsible for implementing the plan.

The large number of points provided is because a citizens' planning committee has the following advantages:

- The participants recognize that they are involved and will be more willing to commit themselves to the process.
- The participants can do some of the work, especially data gathering, thereby reducing the overall cost.
- A committee can be an effective forum for discussing alternatives, debating goals and objectives, and matching the technical requirements of a program to the local situation.
- It gives the participants a feeling of "ownership" of the plan and its recommendations, which helps build public support for it.
- Committee members form a constituency that will have a stake in ensuring that the plan is implemented.

No credit is provided if the committee only meets once or twice. It must meet a sufficient number of times to involve the members in the following key steps of the planning process (e.g., at least one meeting on each step):

4. Assess the hazard
5. Assess the problem
6. Set goals
7. Review possible activities
8. Draft an action plan

A questionnaire is credited if it is distributed to at least 90% of the floodplain residents. For example, it could be included as a page in a newsletter or other outreach project, such as those credited under Activity 330 (Outreach Projects). If the plan covers only the repetitive loss areas, it could go to at least 90% of the residents of those areas.

If the community invites the public to comment during the planning process or holds the meetings credited under items (a) or (b), it must attempt to notify floodplain residents of the meetings and explain the planning process in the notification. The notices of the meetings 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 appearing in the classified section of the newspaper is not sufficient for CRS credit. If very few residents are affected, as may be the case for a plan that addresses only a repetitive loss area, a written record that the residents were called would be sufficient documentation.

Simply discussing the plan at a regular public meeting of the governing body, just before it is voted on, is not sufficient public input for CRS credit. The CRS does not require public hearings. To receive credit for planning, there must be at least one public meeting at the end of the planning process where the proposals are explained and people can ask questions and submit their comments. State and local laws take precedence, however. The community's legal counsel should determine if a public hearing is required.

Planning Process

3. Coordinate (Maximum credit: 18 points). Other agencies and organizations must be contacted to see if they are doing anything that may affect the community's program and to see if they could support the community's efforts. Examples of "other agencies and organizations" include neighboring communities; local, regional, state, and federal agencies; and businesses, academia, and other private and non-profit organizations affected by the hazards or involved in hazard mitigation or floodplain management.

   The credit for this step is the total of the following points. To receive credit for this step, the coordination must include items (a) and (d).

(a) 3, if the other agencies and organizations are contacted at the beginning of the planning process to see if they are doing anything that may affect the community's program and to see how they can support the community's efforts. At a minimum, neighboring communities, the state NFIP Coordinator, the state water resources agency, the county and state emergency management agency, and the FEMA Regional Office must be contacted. (REQUIRED)

(b) 10, if meetings are held with representatives of agencies and organizations to review common problems, development policies, mitigation strategies, inconsistencies and conflicts in policies, plans, programs, and regulations.

(c) 3, if the planning includes a review of existing studies, reports, and technical information and of the community's needs, goals, and plans for the area. (REQUIRED FOR PLANS TO BE CREDITED UNDER THE DISASTER MITIGATION ACT OF 2000)

(d) 2, for sending the draft action plan to the other agencies and organizations and asking them to comment by a certain date. At a minimum, the draft must be sent to neighboring communities, the state NFIP Coordinator, the state water resources agency, the county and state emergency management agency, and the FEMA Regional Office. (REQUIRED)

This step mirrors step 2, which encourages the planner and the planning committee to communicate and coordinate with the public, private organizations, and other stakeholders.

Examples of local and regional agencies that should be contacted include adjacent communities; regional flood, stormwater management, or sanitary districts; levee districts; county flood control authorities; the soil and water conservation district; park districts; and other agencies involved in hazard mitigation or regulation of new development. The State National Flood Insurance Program (NFIP) Coordinator and the state and Federal Emergency Management Agency (FEMA) regional mitigation officers should be able to identify state and federal agencies that may be conducting activities, such as construction projects and regulatory programs, that could affect or should be coordinated with the community's planning.

To receive credit for this step, items (a) and (d) must be implemented. For item (b), the meetings need only be held with those agencies that have the most impact on the community's problem. Some agencies may be so important that their representatives may be invited to sit on the planning committee.

The community's needs and goals should already be identified as part of previous comprehensive planning activities. If not, they should be identified to ensure that the plan's recommendations will be coordinated with other community activities. Community development and floodplain management goals may be mutually supportive or they may conflict.

For example, if the community wants more recreational opportunities, clearing out the floodplain to provide a scenic waterfront park may be most appropriate. Conversely, if the floodplain includes the downtown and local officials are solidly behind economic development, the plan should probably recommend measures other than removing the community's economic base.

Risk Assessment

4. Assess the hazard (Maximum credit: 20 points). The credit for this step is the total of the following points based on what the community includes in its assessment of the hazard. To receive CRS credit for this step, the assessment must include item (a). If the community wants the plan to also qualify for FEMA mitigation funding, item (b) must also be completed.

   (a) 5, for including the following in the plan:

   (1) a map of the known flood hazards. "Known flood hazards" means the floodplain shown on the Flood Insurance Rate Map (FIRM), repetitive loss areas, areas not mapped on the FIRM that have flooded in the past, and surface flooding identified in existing studies. No new studies need to be conducted for this assessment. (REQUIRED)

   (2) a description of the known flood hazards, including source of water, depth of flooding, velocities, and warning time, where such data are available. (REQUIRED)

   (3) a discussion of past floods, where such data are available. (REQUIRED)

   (b) 15, if the plan includes a map, description, and history of other natural hazards, such as erosion, tsunamis, earthquakes, and hurricanes. The plan should include all natural hazards that affect the community, as identified by the state's hazard mitigation plan. (REQUIRED FOR PLANS TO BE CREDITED UNDER THE DISASTER MITIGATION ACT OF 2000)

This step involves gathering and reviewing existing flood studies, including the Flood Insurance Study, drainage problem studies, and SLOSH and SPLASH models that identify areas inundated during hurricanes. For CRS credit, the community does not need to conduct studies to develop new flood data.

Agencies that should be contacted include the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, the Bureau of Reclamation, the Tennessee Valley Authority, the National Weather Service, and state and regional planning, flood, and water resources management agencies. Some of these agencies may also be able to provide assistance in preparing the plan. State and county emergency management agencies should have information on other natural hazards.

State and county emergency management agencies should have information on other natural hazards. Each state has prepared a multi-hazard mitigation plan (formerly known as a "409" plan), which is an excellent source of information on hazards that affect various parts of the state.

The hazard assessment needs to describe the local flood hazard and not be a broad or generic discussion of flooding in general. Because the most important readers are elected officials and floodplain residents, the descriptions of the hazards should be in lay terms.

For CRS purposes, the community's planning may address only some of its floodplain, such as a problem stream, a lakeshore, or a repetitive loss area. This step will be credited if the three items listed under (a), above, are included in the hazard assessment for that area. The impact adjustment in Section 512.b will adjust the credit points to reflect that not all of the community's flood problems are covered in the plan.

NOTE: *In order to qualify for FMA or HMGP funds, the plan must address ALL of the community's flood and other natural hazards identified in the hazard assessment.*

Risk Assessment

5. Assess the problem (Maximum credit: 35 points) The credit for this step is the total of the following points based on what is included in the assessment of the vulnerability of the community to the hazards identified in the previous hazard assessment step. To receive credit for this step, the assessment must include item (a) and must evaluate the hazard data in light of their impact on the community. Simply listing data, such as the names of the critical facilities or the number of flood insurance claims, will not suffice for credit.

   (a) 2, if the plan includes an overall summary of each hazard identified in the hazard assessment (step 4) and its impact on the community. (REQUIRED)

   (b) 5, if the plan includes a description of the impact that the hazards identified in the hazard assessment (step 4) have on life, safety, and health and the need and procedures for warning and evacuating residents and visitors;

   (c) 5, if the plan includes a description of the impact that the hazards identified in the hazard assessment have on critical facilities and infrastructure;

   (d) 5, for including the number and types of buildings subject to the hazards identified in the hazard assessment;

   (e) 4, if the assessment includes a review of all properties that have received flood insurance claims (in addition to the repetitive loss properties) or an estimate of the potential dollar losses to vulnerable structures;

   (f) 4, if the plan describes areas that provide natural and beneficial functions, such as wetlands, riparian areas, sensitive areas, and habitat for rare or endangered species;

   (g) 5, if the plan includes a description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevel-

opment in the community, the watershed, and natural resource areas; and

(h) 5, if the plan includes a summary of the impact of each hazard on the community's economy and tax base.

When a multi-jurisdictional plan is prepared, the critical facilities, building counts, and similar data must be presented for each community seeking CRS credit.

The previous step assessed the hazards facing the community. This step looks at the impact of those hazards. For example, a flood hazard area may or may not have flood problems. Flooding is viewed as a natural occurrence. A floodplain is only a problem if human development gets in the way of the natural flooding.

In this step, the community planners or planning committee members collect and summarize data on what is at risk. An inventory is needed to ensure that all problem areas are addressed by the plan.

Emergency management plans may have information on the impact of the hazards on public safety and health. A review of past floods would show if there have been illnesses caused by the water or debris after the flood.

See Section 130 for the definition of "critical facilities" used for CRS purposes. A map that shows critical facilities can identify health and safety problems caused by disasters, such as when the wastewater treatment plant is flooded.

The inventory should include how many and what types of buildings are affected (e.g., residential, commercial, industrial, with or without basements, etc.). In smaller communities, exact counts can be made using aerial photos or windshield surveys. In larger communities, these numbers will likely be approximates.

Data on building damage usually can be obtained from post-disaster damage assessment reports, flood insurance claims or disaster assistance data, and flood control studies. Emergency management offices and FEMA may be able to help locate such data.

Communities are encouraged to include repetitive loss areas in their problem assessment (Category C repetitive loss communities must base their plan on where repetitive insurance claims have been paid). In order to receive the 5 points credit under the second item, the community must request a printout of ALL the addresses of properties that have received flood insurance claims, not just the repetitive loss properties.

Use of flood insurance claim and disaster assistance information is subject to the Privacy Act, which prohibits public release of the names of policy holders or recipients of financial assistance and the amount of the claim payment or assistance. However, maps showing AREAS where claims have been

paid can be made public. The data can be used for internal planning and can be very helpful in identifying problem areas that may not be apparent on a floodplain or drainage map.

Along with flood protection, comprehensive floodplain management planning should review the unique natural features, natural areas, and other environmental and aesthetic attributes that may be present in the floodplain. Protecting and preserving these natural and beneficial floodplain functions yield flood protection benefits and also help integrate floodplain management efforts with other community goals and objectives.

Mitigation Strategy

6. Set goals (Maximum credit: 2 points). The two credit points for this step are provided if the plan includes a statement of the goals of the community's floodplain management or hazard mitigation program. (REQUIRED)

The planning committee may need several meetings to work out goals statements to which everyone can agree. The goals should set the context for the subsequent review of floodplain management activities and drafting of the action plan. They should incorporate or be consistent with other community goals for the affected areas. A multi-hazard mitigation plan should have goals that address all the major hazards that face the community.

Goals statements do not have to state how the goals will be attained, but they should address the priority problems as identified in the previous step. For example, a goal could state "protect buildings from flood damage" rather than "stop the flooding" or "remove the buildings from the floodplain."

Example 511.f.

The following are some example goals statements for Floodville:

- ☐ Protect the buildings in repetitive loss area #1 (Woodbridge Road and 40th Street) and repetitive loss area #2 (Adams and Cleveland Streets) from flood damage.
- ☐ Protect the Foster Creek bottomlands from development that will disturb habitats.
- ☐ Expand Foster Creek Park to provide more recreational facilities to serve the growing north side of the City.
- ☐ Prevent new development in the watershed from increasing runoff and resulting increases in flood flows into the City.
- ☐ Ensure that new buildings are constructed to the latest wind and earthquake protection standards.
- ☐ Ensure that residents are given adequate warning of ice jam floods and tornadoes.

Mitigation Strategy

7. Review possible activities (Maximum credit: 30 points) The plan must describe those activities that were considered and note why they were or were not recommended (e.g., they were not cost-effective or they did not support the community's goals). (REQUIRED)

   If an activity is currently being implemented, the plan must note whether it should be modified. The discussion of each activity needs to be detailed enough to be useful to the lay reader.

   The credit for this step is the total of the following points based on which floodplain management or hazard mitigation activities are reviewed in the plan.

   (a) 5, if the plan reviews preventive activities, such as zoning, stormwater management regulations, building codes, and preservation of open space and the effectiveness of current regulatory and preventive standards and programs;

   (b) 5, if the plan reviews property protection activities, such as acquisition, retrofitting, and insurance;

   (c) 5, if the plan reviews activities to protect the natural and beneficial functions of the floodplain, such as wetlands protection;

   (d) 5, if the plan reviews emergency services activities, such as warning and sandbagging;

   (e) 5, if the plan reviews structural projects, such as reservoirs and channel modifications; and

   (f) 5, if the plan reviews public information activities, such as outreach projects and environmental education programs.

The objective of this step is to ensure that all possible measures are explored, not just the traditional approaches of flood control, acquisition, and regulation of land use. Figure 510-1 provides a list of some of the types of activities that could be reviewed under each of the six categories. More information on the activities is provided in *Example Plans*.

The range of activities should be evaluated for each site or area affected. While some of them may be quickly eliminated as inappropriate, most deserve careful consideration, especially to ensure full understanding of their costs and benefits. Questions about technical aspects or agency programs can be handled during coordination with other agencies and organizations (see step 3).

The community should strive for a balanced program, selecting measures from more than one category of floodplain management activity. In every case, the community should implement preventive activities to keep its flood problems from getting worse and to protect new construction from the effects of natural hazards.

1. **Preventive** activities keep problems from getting worse. The use and development of floodprone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
   - Planning and zoning
   - Open space preservation
   - Floodplain regulations
   - Building codes
   - Stormwater management
   - Drainage system maintenance
   - Dune and beach maintenance

2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis. They include:
   - Relocation
   - Acquisition
   - Building elevation
   - Retrofitting
   - Sewer backup protection
   - Insurance

3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are usually implemented by parks, recreation, or conservation agencies or organizations.
   - Wetlands protection
   - Erosion and sediment control
   - Best management practices
   - Coastal barrier protection

4. **Emergency services** measures are taken during an emergency to minimize its impact. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
   - Hazard warning
   - Hazard response
   - Critical facilities protection
   - Health and safety maintenance

5. **Structural projects** keep floodwaters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
   - Reservoirs
   - Levees/floodwalls/seawalls
   - Diversions
   - Channel modifications
   - Beach nourishment
   - Storm sewers

6. **Public information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.
   - Map information
   - Outreach projects
   - Real estate disclosure
   - Library
   - Technical assistance
   - Environmental education

Figure 510-1. Floodplain management categories and activities.

Mitigation Strategy

8. Draft an action plan (Maximum credit: 70 points). The action plan specifies those activities appropriate to the community's resources, hazards, and vulnerable properties.

   For each recommendation, the action plan must identify who does what, when it will be done, and how it will be financed. (REQUIRED)

   The credit for this step is based on what is included in the action plan. Credit is provided for a recommendation on floodplain regulations, provided it recommends a regulatory standard that exceeds the minimum requirements of the NFIP.

   (a) 10, if the action plan includes recommendations for activities from two of the six categories credited in step 7, Review possible activities.

   (b) 20, if the action plan includes recommendations for activities from three of the six categories credited in step 7, Review possible activities.

   (c) 30, if the action plan includes recommendations for activities from four of the six categories credited in step 7, Review possible activities.

   (d) 40, if the action plan includes recommendations for activities from five of the six categories credited in step 7, Review possible activities.

   (e) 10 additional points are provided if the action plan establishes post-disaster mitigation policies and procedures.

   (f) 10 additional points are provided if the action plan's recommended natural resource protection activities include recommendations from a Regional Habitat Conservation Plan as credited under Section 511.b.

   (g) 10 additional points are provided if the plan includes action items (other than public information activities) to mitigate the effects of the other natural hazards identified in the hazard assessment (step 4, item (b)).

   If the plan calls for acquiring properties, there must be a discussion of how the project(s) will be managed and how the land will be reused.

   When a multi-jurisdictional plan is prepared, it must have action items from at least two of the six categories that directly benefit each community seeking CRS credit.

The first consideration in the selection of recommended activities is to ensure that the measures are technically appropriate for the hazard threat. The measures should be appropriate for community development trends, needs and goals. The action plan needs to be affordable, implementable, and permitted by local, state, and federal regulations. Where possible, each measure should have objectives that are easy to measure when accomplished.

There is no requirement that a floodplain management plan identify expensive or massive structural flood control projects. The plan should recommend only those activities that the community can be assured will be implemented, either through its own resources or confirmed outside support. Many of the activities could receive CRS credit once they are implemented.

Post-disaster policies should account for the expected damage from a base flood or other disaster. For example, the action plan should identify the areas likely to be worst hit and the policies should determine whether they will be rebuilt if substantially damaged. Post-disaster mitigation procedures should assign responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund flood loss reduction activities..

Example 511.h.

Floodville's plan was adopted in 1997. Here are some of the Action Plan recommendations:

1. The Planning Commission will review amendments to the floodplain regulation ordinance to prohibit new buildings, filling, or other land disturbance in the Foster Creek bottomlands.

   Action: Report recommended ordinance language to the City Council by March 1998.

   Budget: staff time (operating funds).

2. 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 1998.

   Budget: staff time (operating funds).

3. 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 1999.

   Budget: staff time (operating funds).

4. The Public Information Officer will distribute a flood hazard notice to each resident of the Special Flood Hazard Area (SFHA) each year. It will include the warning procedures for ice jam flooding and what to do when warnings are issued.

   Action: Have the notices in the mail by the beginning of winter each year.

   Budget: staff time (operating funds).

5. Six properties in repetitive loss area #1 on the west side of 40th Street, should be purchased. The sites should be cleared and added to Foster Creek Park.

   Action: The City Planning Office will apply for funding from FEMA's Flood Mitigation Assistance Program by August 1999.

   Budget: staff time (operating funds).

   Action: The Park District will acquire the properties by August 2000.

   Budget: Flood Mitigation Assistance Program.

   Action: Clear the properties and restore them to approximate a natural state by August 2001.

   Budget: Park District capital improvement budget.

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 credit.

The plan must be an official plan of the community, not an internal staff proposal. State and regional plans are not adequate unless they specifically address the community's natural hazards and the community's governing body adopted the plan.

Plan Maintenance

10. Implement, evaluate, and revise (Maximum credit: 35 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) 8, if the evaluation report is prepared by the same planning committee that prepared the plan.

(c) 25, if the evaluation report is prepared by the same planning committee that prepared the plan AND the committee qualifies for credit under step 2, items (f) and (g).

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. It 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.

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. Habitat conservation plan (HCP)

HCP = the total of the following points:

10, if the community has adopted a regional Habitat Conservation Plan or other plan that explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species. The plan must have been adopted by the community's governing board and there must be documentation that the plan is being implemented. The plan must identify:

- the species in need of protection,
- the impact of new development on their habitat,
- alternative actions that could be taken to protect that habitat,
- what actions are recommended to protect that habitat and why they were selected from the alternatives, and
- how the recommendations will be funded.

5, if the plan has also been accepted as a Habitat Conservation Plan by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

Regional Habitat Conservation Plans are "broad-based, landscape level planning tools" that identify steps that reduce conflicts between land development activities and the need to protect threatened or endangered species. They can prove very useful in providing ways for development to comply with the Endangered Species Act and to reduce the costs of conservation activities on individual property owners. For more information, see the *Habitat Conservation Planning Handbook*.

This credit of 10 points is provided if the community has adopted a habitat conservation plan or a similar plan with the objective of protecting rare, threatened, or endangered species. The credit of 10 points in step 8, item (f) is also provided if the community's floodplain management plan includes recommendations from its habitat conservation or similar plan.

There is credit of 15 points in Section 431.g.3 if the community has adopted regulations pursuant to its habitat conservation plan. A habitat conservation plan can also help with credit in Section 421.c by documenting the value of preserving natural areas as open space.

512 Impact Adjustment

a. Option 1:

rFMP = 1.0 if the planning covers all of the community's known flood hazard areas.

b. Option 2:

rFMP = 0.25 if the planning covers either:

1. all of the community's repetitive loss areas or
2. less than all, but at least 25% of, the community's known flood hazard areas.

There is no impact adjustment for the habitat conservation plan credit (HCP). Option 1 can only be used if the planning covers all of the community's known flood hazard areas. "Known flood hazards" means the SFHA shown on the FIRM, repetitive loss areas, areas not mapped on the FIRM that have flooded in the past, and surface flooding identified in existing studies (see step 4).

If the planning covers all repetitive loss areas, then a default impact adjustment ratio of 0.25 may be used. This option can also be used if the community's planning effort addressed only one or two watersheds, which cover at least 25% of all of the community's known flood problems.

Example 512.c-1. Floodville's planning covers all of the SFHA and other areas of known flood hazard. The City chooses option 1 and rFMP = 1.0.

Example 512.c-2. Gulf Beach County has many flood hazard areas and the staff is unable to prepare a plan that addresses all of them. The County has prepared a floodplain management plan that addresses all three of its repetitive loss areas. These areas represent approximately 10% of all of the buildings in the County's SFHA. The County chooses Option 2 and rFMP = 0.25.

513 Credit Calculation

a. FMP = the total of the credit points for the 10 steps in Section 511.a. If the credit for any one of the 10 steps is 0, then FMP = 0.

b. c510 = (FMP x rFMP) + HCP

Example 513.

Floodville's plan was prepared using the following process:	Item Score	Step Total
Planning Process		
1. Organize to prepare the plan:		
The plan was prepared by the City Planner	2	
with help from a committee with representatives from other departments.	6	8
2. Involve the public		
Questionnaires were sent to residents with one of the City's annual outreach projects.	4	
The public was invited to comment at the beginning of the planning process and a public meeting was held to review the draft.	2	6
3. Coordinate with other agencies		
Letters were sent to other agencies asking for input.	3	
Meetings were held with key agencies.	10	
The planner reviewed the community's needs, goals and plans for the area.	3	
The draft action plan was sent to other agencies.	2	18

	Item Score	Step Total
Risk Assessment		
4. Assess the hazard		
The plan includes a map and description of the flooding in the SFHA and the newly mapped area.	5	5
5. Assess the problem		
An overall summary of the impact of the hazards.	2	
The plan discusses the impact on life, safety, and health	5	
The plan describes the impact on critical facilities.	5	
The plan discusses the numbers and types of buildings	5	17
Mitigation Strategy		
6. Set goals	2	2
7. Review possible activities		
The plan reviews preventive activities.	5	
The plan reviews property protection activities.	5	
The plan reviews structural projects.	5	
The plan reviews public information activities.	5	20
8. Draft an action plan		
The action plan recommends preventive, property protection, structural projects, and public information activities.	30	30
Plan Maintenance		
9. Adopt the plan	2	2
10. Implement, evaluate, and revise		
The staff has prepared procedures for the annual evaluation.	2	2
Total points, FMP =		110

c510 = (FMP x rFMP) + HCP = (110 x 1.0) + 0 = 110

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. 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. The documentation submitted must be marked in the margins to show where the 10 credited steps appear. 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

Step 10. how the plan will be periodically evaluated and revised

b. Documentation showing how the public was involved in preparing or reviewing the plan, including a copy of the notice(s) advising residents about the meeting(s) held pursuant to step 2, and a record of that meeting.

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.

c. 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.

The community must submit the following documentation with its annual CRS recertification (see Section 214):

d. An annual report on evaluating progress toward implementing the action plan's objectives. The evaluation report must be submitted as part of the community's annual recertification.

   1. If the community uses Option 1 for the impact adjustment ratio rFMP (see Section 512), the report must include the following:

      (a) How the reader can obtain a copy of the original plan;

      (b) A review of each recommendation in the action plan, including a statement on how much was accomplished during the previous year;

      (c) A discussion of why any objectives were not reached or why implementation is behind schedule; and

      (d) Recommendations for new projects or revised objectives.

   2. If the community uses Option 2 for the impacts adjustment ration rFMP, it may provide the documentation in Section 514.d.1 above or it may use the activity worksheet AW-510-3 as the basis for its annual progress report.

   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 planning credit (FMP = 0). Without continued planning 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 being submitted with the community's annual CRS recertification.

The review of each recommendation in the action plan 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").

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.

Step 10 shows how the credit points are provided for the evaluation process. When the community submits its recertification, it must include appropriate documentation to show that its evaluation process is conducted in accordance with the points credited. For example, to document releasing the draft report to the media, the recertification must include a copy of the news release, a newspaper article, or similar documentation.

Example 514.d-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.

Example 514.d-2. Gulf Beach County's staff uses AW-510-3 for its annual evaluation report for the floodplain management plan for the County's repetitive loss areas.

FAILURE TO SUBMIT THE 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). LOSS OF CREDIT FOR THIS ACTIVITY WILL CAUSE A REPETITIVE LOSS CATEGORY C COMMUNITY TO REVERT TO A CLASS 10.

e. An update to the plan, prepared at least every five years. If the plan is more than five years old, 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 update did not involve a committee (i.e., it was only done by staff), no credit will be provided under step 1, item (b) or step 2, items (f) or (g).

   2. 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
- any other change in flooding conditions and/or development exposed to flooding or other hazards.

3. 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.

4. Step 3: The update must include item (d), sending the draft update to other agencies for comment.

5. Step 2: The update process must include item (a), holding a public meeting before adoption.

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 planning credit, a category C repetitive loss community will revert to a Class 10.

515 For More Information

a. See Appendix E to order a free copy of *Example Plans*.

b. 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.

c. 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 initiated a new "how-to" series of guides on state and local mitigation planning. The first guide is FEMA # 386-2, *Understanding Your Risks, identifying hazards and estimating losses,* August, 2001, 146 pages. Also available at http://www.fema.gov/mit/planning_toc3.htm More in the series will be published in 2002 and 2003.

Planning for Post Disaster Recovery and Reconstruction, American Planning Association (APA) Planning Advisory Service, 346 pages, APA Report # 483/484 (no FEMA number), 1998.

Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability, 43 pages, FEMA 364, 2000. Also found at http://www.fema.gov/mit/planning_toc.htm

Rebuilding for a More Sustainable Future: An Operational Framework, FEMA 365, 2000. Also found at http://www.fema.gov/mit/planning_toc2.htm

Design Guidelines for Flood Damage Reduction, FEMA-15, 1981.

Conceptual Framework and Basic Strategies and Tools for Implementing A Unified National Program for Floodplain Management, FEMA-168, 1989.

Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials, FEMA-116, 1987.

"Benefit/Cost Analysis of Hazard Mitigation Projects," FEMA, computer software with instructions, 1995.

d. 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.

e. 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.

f. 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

g. 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.

Community Flood Mitigation Planning Guidebook, Wisconsin Department of Natural Resources, 1995, (608) 266-0161.

Flood Proofing: How to Evaluate Your Options, U.S. Army Corps of Engineers, 1994.

Flood Hazard Mitigation Handbook, Bruce Menerey and Kirstin Kinzley, Michigan Department of Natural Resources, 1988, (517) 335-3182.

Flood Hazard Mitigation in Northeastern Illinois, a Guidebook for Local Officials, Northeastern Illinois Planning Commission, 1995, (312) 454-0400.

h. 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.

i. 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 web site, http://www.floods.org or call (608) 274-0123, $12.

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514.d OPTION 2 PROGRESS REPORT Community: Gulf Beach County .

***NOTE:** This page is only used by a community that used Option 2 in Section 512.b for its verified CRS credit for Activity 510.*

This report is prepared for submittal for continued credit under the National Flood Insurance Program's Community Rating System (CRS). It is designed to provide a short update and report on accomplishments toward implementing the community's repetitive loss plan. Copies of this report must be distributed to the local media and the community's governing board and be made available to the public. It is also submitted to the state and the Federal Emergency Management Agency as part of its annual CRS recertification.

1. Name of the floodplain management plan: Gulf Beach County Repetitive Loss Plan

   Date adopted: September 15, 2000

   Location where copies are available for review: Planning Office
   County Courthouse

2. Summarize any floods that occurred during the year:

   A tropical depression hit the coastline in August, causing some beach erosion, but no damage to buildings.

   What impact did the floods have on the repetitive loss areas?

   It heightened awareness of the coastal flood hazard. The Planning Office got twice as many calls for retrofitting assistance as usual.

3. On a separate sheet, list each element or objective of the original plan and note how much was accomplished during the previous year (this can be a photocopy of the plan's recommendations with a note describing implementation of each). See attached sheet.

4. Were any objectives not reached or is implementation behind schedule? If so, state why:

   3.b. Acquire floodprone buildings - no funding obtained yet.
   4.e. Develop flood response plan for inland riverine areas - Emergency Manager resigned and has not yet been replaced.

5. Should new projects be started or should any of the recommendations or objectives be revised?
   2.a. Public information - The Planning Office should develop materials that can be quickly disseminated after a storm, while interest is high. To be done by next summer.

For more information, contact: William Berry Phone: 101/555-6789 .

Activity Worksheet AW-510-3 Edition: 2002

Figure 510.2. Gulf Beach County's activity worksheet for its option 2 progress report (AW-510-3).

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520 ACQUISITION AND RELOCATION

Summary of Activity 520

521 Credit Points. There are two elements in this activity for a maximum of 3,200 points.

a. Buildings acquired or relocated (bAR): Up to 3,200 points are provided based on the number of buildings acquired, relocated, or otherwise cleared from the regulatory floodplain since the effective date of the Flood Insurance Rate Map (FIRM).

b. Buildings on the repetitive loss list that have been acquired or relocated (bRL). Repetitive loss buildings counted for this element may have been located anywhere in the community.

522 Impact Adjustment. All buildings must have been removed from the SFHA in order to receive the full 3,200 points for this activity. The credit points are adjusted in one of two ways.

a. Under Option 1, if 20 or fewer buildings have been removed, a default impact adjustment gives 5 points for each building.

b. Under Option 2, the credit points are adjusted to reflect the number of buildings that have been acquired or relocated from the Special Flood Hazard Area (SFHA).

523 Credit Calculation.

a. Under Option 1, the number of buildings (bAR) is multiplied by the default value of 5.

b. Under Option 2, the impact adjustment ratio is multiplied by 32.

524 Credit Documentation. The community must have the following.

a. A map showing the parcels where floodprone buildings have been demolished or relocated since the effective date of the FIRM and the total number of such buildings (bAR and bRL).

b. Documentation that shows that each site credited under this activity can also qualify for credit as preserved open space in Activity 420.

c. [If the community is using Option 2] Calculations showing the number of buildings in the SFHA.

d. Real estate or permit records that document the date of removal of each building.

e. [If credit is being requested for buildings outside the SFHA] Documentation showing that floodplain regulations are in effect in the area outside the SFHA.

525 For More Information.

520 ACQUISITION AND RELOCATION

Credit is provided for acquiring, relocating, or otherwise clearing buildings out of the flood hazard area.

Background: The surest way to protect a building from flood damages is to remove it from the floodplain. The most common method of doing this is for a government agency to acquire the property and demolish the building or move it to high ground. A less frequently used approach is for the owner to relocate it to high ground, either on the same lot or to a different one.

Activity Description: This activity credits either approach as long as an insurable building is removed from the path of flooding and the community can document that the property will stay vacant. The credit is based on the number of buildings cleared as a portion of the total number of buildings in the community's Special Flood Hazard Area (SFHA). The credit is provided only if the site qualifies for credit under Activity 420 (Open Space Preservation).

There is, in effect, duplicate credit for purchasing a property and maintaining it as public open space because the vacant lot must also qualify for the open space preservation credit under Section 421.a of Activity 420 (Open Space Preservation). If the community can obtain or require a deed restriction at the time of acquisition or relocation, credit is also provided under 421.b.

No Community Rating System (CRS) credit is provided for acquisition or relocation projects undertaken before the community joined the Regular Phase of the National Flood Insurance Program (NFIP). No credit is provided for removing a building if another building has since been built on the same site, even if the new building was built to flood protection standards. A description of the kinds of buildings that can be counted toward bAR is found in Sections 301 through 303.

521 Credit Points

Maximum credit for Activity 520: 3,200 points.

a. Buildings acquired or relocated (bAR) (Maximum credit: 3,200 points)

bAR = the number of buildings acquired, relocated, or otherwise cleared from the regulatory floodplain since the effective date of the Flood Insurance Rate Map (FIRM). The regulatory floodplain is as shown on the Impact Adjustment Map discussed in Section 403. It may include areas outside of the SFHA.

To be counted toward bAR, an acquired or relocated building must meet these requirements:

1. It must be an insurable building (see Section 301);

2. It must have been acquired or relocated after the date of the community's initial Flood Insurance Rate Map (FIRM);

3. It must not have been replaced by another building on the floodprone portion of the same lot and the site will remain preserved as open space;

4. The lot must be plotted on the map discussed in Section 524.a; and

5. The building must have been located in the regulatory floodplain as shown on the Impact Adjustment Map prepared in accordance with Section 403.

If the community did not prepare an Impact Adjustment Map, credit is provided for buildings that were in the SFHA as shown on the community's current FIRM. If areas outside the SFHA are included in the community's regulatory program and credit is requested for buildings acquired or relocated in these areas, the community must demonstrate that these buildings were in areas currently under regulation.

A building that lies outside the regulatory floodplain (aRF) because of remapping, completion of a flood control structure, or other activity is not eligible for this credit. Such a building has already benefitted twice: it does not have a mandatory NFIP insurance purchase requirement; and if the owner chooses to purchase NFIP insurance, the premium will be based on the lower X-Zone rate.

NOTE: *See Section 504 on projects funded by FEMA's Flood Mitigation Assistance (FMA) program.*

Example 521.a-1. A check of building permit records since the community's initial FIRM date has shown that 12 homes in Floodville's regulatory floodplain were bought and cleared as part of a community development project. Four buildings were demolished to make way for a new parking lot. Two people have moved their homes to higher ground on their lots outside the SFHA and above the base flood elevation and the City purchased easements to keep the floodprone portions of the lots open. Six buildings were destroyed by flooding. The City has purchased the six lots, two under FEMA's Section 1362.

bAR = 12 + 4 + 2 + 6 = 24

All 24 properties qualify for OS credit under Activity 420 (Open Space Preservation). Because the lots were small, the City opted to save some paperwork and not include all of them in its application for Activity 420. Only those properties that were added to Foster Creek Park were included in the application for Activity 420. However, the City can still document that the other properties meet the credit criteria for open space under Activity 420 as described in Section 421.a.

The City used a copy of the tax assessor's map to show the location of each of the 24 properties.

b. Buildings on the repetitive loss list that have been acquired or relocated (bRL)

bRL = the number of buildings that are listed on FEMA's repetitive loss list that have been acquired, relocated, or otherwise removed from the flood problem site they occupied.

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.

This element provides credit for those properties on the list that have been acquired, relocated, or otherwise removed from the site where they suffered flooding. The buildings must meet the first four criteria for bAR noted above. They do not have to meet the fifth requirement, i.e., be located in the regulatory floodplain. To be credited toward bRL, the building may be relocated anywhere in the community.

This element is verified by a review of the community's corrected repetitive loss list and field verified with the other buildings credited for bAR. A community with no properties on the FEMA repetitive loss list is not eligible for this credit.

Example 521.b-2. As noted in Section 503, Floodville has 20 properties on its repetitive loss list. Six of those properties have been purchased and preserved as open space (the lots are now part of Foster Creek Park).

bRL = 6 Note that the same six properties also qualify for bAR.

522 Impact Adjustment

a. Option 1

c520 = (bAR + bRL) x 5. The maximum credit for c520 under Option 1 is 100.

If the community has acquired, relocated, or otherwise removed 20 or fewer buildings, then the default credit calculation formula gives five points for each building. There is no impact adjustment formula under Option 1. The maximum credit for Activity 520 under Option 1 is 100 points.

b. Option 2:

bSF = the number of buildings in the SFHA.

$$rAR = \frac{100 \times (bAR + bRL)}{bSF + bAR + bRL}.$$ rAR cannot be greater than 100.0.

Under Option 2, the credit points are based on the ratio of buildings that have been acquired or relocated from the regulatory floodplain (rAR). This is done by dividing the number of buildings acquired or relocated (bAR + bRL) by the number of buildings in the SFHA (bSF) plus (bAR + bRL). The numerator is multiplied by 100.

A detailed discussion of impact adjustment ratios based upon buildings can be found in Sections 302 and 303. The variable bSF is described in more detail in Section 303.

The denominator includes all existing buildings PLUS all buildings that have been acquired or relocated. The denominator does not change as more buildings are removed from the regulatory floodplain (i.e., the total of bSF + bAR + bRL stays the same). However, rAR can decrease if more buildings are built in the floodplain (i.e., if bSF increases over time).

It should be noted that bAR buildings are in the regulatory floodplain (aRF) while bSF buildings are only in the SFHA as shown on the FIRM. If a community maps and regulates non-SFHA flood problem areas, it can also count buildings acquired or relocated from those areas towards bAR. This will result in a higher score.

Also, communities should note that if development is allowed in the SFHA, even if it is in compliance with the NFIP requirements, credit for this activity may decrease over time as the denominator increases.

Example 522.b-1. As discussed above for Floodville, bAR = 24 and bRL = 6. bSF is the total number of buildings currently in the Special Flood Hazard Area. These include:

250	pre-FIRM buildings (bPR in Activity 310)
22	buildings built between the initial FIRM date and the CRS application date (bPO in Activity 310)
10	buildings built since the CRS application date (bEC in Activity 310)
282	buildings in the Special Flood Hazard Area (bSF)

$$rAR = \frac{100 \times (24 + 6)}{282 + 24 + 6} = \frac{3{,}000}{312} = 9.62$$

523 Credit Calculation

a. Option 1: c520 = (bAR + bRL) x 5. If (bAR + bRL) > 20, then c520 = 100.

b. Option 2: c 520 = 32 x rAR

A community may use whichever formula provides the larger score. If a community has acquired and relocated more than 20 buildings, it may still use Option 1 and apply for credit for only 20 of those buildings. A community may want to do this if this approach provides more points than Option 2 or if the staff does not want to or is unable to calculate the values for the variables in the formula. The maximum value for c520 under Option 1 is 100.

Example 523-1. For Floodville:

c520 = 32 x 9.62 = 307.84, which is rounded to 308.

During the verification visit, the ISO/CRS Specialist reviewed the documentation for a sample of the buildings and found that they were all eligible for AR credit. She then visited the sites of a sample of the buildings to verify that there were no floodprone structures on them.

524 Credit Documentation

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

a. A map showing the location of parcels where floodprone buildings have been demolished or relocated since the effective date of the FIRM and the total number of such buildings (bAR and bRL).

This map may be the same one used for documentation of open space credit under Section 424.d under Activity 420 (Open Space Preservation). It need only show the part of the community where buildings have been cleared. It should show lot boundaries. The map will be used by the ISO/CRS Specialist to check the sites during the verification visit.

b. Documentation that shows that each site credited under this activity can also qualify for credit as preserved open space. This may be done by applying for Open Space (OS) credit under Activity 420 (Open Space Preservation) or by submitting the same documentation necessary for such credit as specified in Sections 424.a or 424.b.

As explained in Section 421.a, a site may be preserved as open space through public ownership or easement, ownership by a private preserve, or prohibitory development regulations. For acquisition and relocation credit, the community must demonstrate that the site will remain vacant by showing that it also qualifies for credit under Activity 420 (Open Space Preservation).

c. [If the community is using Option 2 under Section 522.b] Calculations showing the total number of buildings in the SFHA (bSF).

The variable bSF represents the number of buildings in the SFHA. It is discussed in detail in Sections 302 and 303.

d. Real estate or permit records that document the date of removal of each building.

The community's building permit files should have records on relocation and demolition projects. This documentation is used to confirm that the building was removed after the effective date of the initial FIRM.

e. [If the community is applying for credit for acquisition or relocation of buildings located outside the SFHA] Documentation that shows that floodplain regulations are in effect in the area outside the SFHA.

If the community's regulatory floodplain includes areas outside the SFHA shown on the FIRM, the community may request credit for acquisition or relocation of floodprone buildings outside the SFHA. However, the community must show that the areas outside the SFHA are subject to floodplain regulations. Often this documentation is supplied with the application for Activity 410 (Additional Flood Data). This documentation ensures that credit is given only for acquiring or relocating genuinely floodprone buildings.

525 For More Information

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

b. The Corps of Engineers can provide technical information and advice to communities interested in relocation of buildings to flood-free sites. Requests for assistance should be addressed to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps.

c. FEMA's Hazard Mitigation Grant and Flood Mitigation Assistance Programs are possible sources of financial assistance for acquiring and relocating floodprone properties. Contact your state NFIP Coordinator or ISO/CRS Specialist for the names of the people who run these programs. Additional programs are noted in Appendix F.

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 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
- 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
- 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.

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 up to a maximum of 84 points.

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. The retrofitting techniques are described further in Figure 530-2, at the end of this activity.

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 lowers 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 flooding. 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 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 Federal Emergency Management Agency's (FEMA's) repetitive loss list (see Section 501).

Flood protection techniques that are recognized by this activity include:

Retrofitting projects:

- Elevating buildings above flood levels
- Dry floodproofing
- Wet floodproofing
- 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
- 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,
3. Levees or floodwalls that protect more than one property (such levees are covered under Activity 620 (Levee Safety)).

4. Dams that do not meet dam safety requirements.
5. Structural flood control projects owned AND operated by a federal agency.

Credit is not provided for the major flood control works owned and operated by agencies like the Corps of Engineers, Tennessee Valley Authority, and the Bureau of Reclamation. However, credit is provided for locally owned and operated projects that were partially funded by a federal agency.

6. Projects that protect buildings outside of the regulatory floodplain. There is no CRS credit for buildings (except repetitive loss buildings) that have been removed from the regulatory floodplain by a structural project.

If the community prepared an Impact Adjustment Map in accordance with Section 403 that shows floodprone areas subject to regulation outside of the Special Flood Hazard Area (SFHA), then buildings in the regulatory floodplain but outside the SFHA may be counted for this credit.

If the community did not prepare an Impact Adjustment Map, credit is provided for buildings in the SFHA shown on the current FIRM. If areas outside the SFHA are included in the community's regulatory program and credit is requested for protected buildings in these areas, the community must demonstrate that these buildings are in areas currently under regulation.

A building that lies outside the regulatory floodplain (aRF) because of remapping, completion of a flood control structure, or other activity is not eligible for this credit.

7. Projects implemented due to a requirement of the National Flood Insurance Program (NFIP), such as elevating a substantially damaged or substantially improved residential building. However, credit is provided for replacing a pre-FIRM building with a new or substantially improved post-FIRM building if the project was implemented voluntarily or pursuant to a community action, such as providing financial assistance or declaring a dilapidated structure to be unsafe and uninhabitable.

The NFIP requires that new, substantially improved, or substantially damaged residential buildings be elevated to or above the base flood level and new, substantially improved, or substantially damaged non-residential buildings be elevated or dry floodproofed to or above the base flood level. Some items to note about these requirement are:

- The CRS credits other retrofitting measures, provided that the project is NOT part of a substantial improvement or a repair to a substantially damaged building.

- Credit is NOT provided for requiring new, substantially improved, or substantially damaged buildings to meet the minimum requirements of the NFIP.

- Similarly, if a community constructed a project to mitigate the adverse effect of not properly regulating new construction in accordance with a court order or an agreement with FEMA, then that action would be considered one taken to meet the minimum requirements of the NFIP and would not be credited.

The retrofitting techniques are described in more detail in Figure 530-2 at the end of this activity. The credit points are based on the effectiveness of the technique in preventing flood damage. The most effective techniques are elevation and those measures designed by a licensed engineer or architect.

Credit is also provided for certain structural flood control projects that reduce the flood hazard to a property. Structural flood control projects are also discussed in Activities 620 and 630 (Levee Safety and Dam Safety).

531 Credit Points

Maximum credit for Activity 530: 2,800 points. However, there is a maximum of 1,000 points for structural flood control projects and 200 for sewer backup protection projects.

Prerequisites:

a. 1. Each flood protection project must meet the following criteria:

(a) All required permits must have been issued for the project or the local permit officer must state in writing that the project complies with all federal, state, and local codes and regulations.

(b) The project must protect a building from at least the 25-year flood.

(c) If the project requires human intervention, there must be at least one hour of flood warning time plus the time it takes to install the measure. “Human intervention” means that a person must be at the site to close an opening or install or operate a protection device before floodwaters reach the building.

(d) The project must have been completed after the effective date of the initial FIRM.

(e) Credit is not provided for a retrofitted building or flood control project in disrepair or that otherwise does not appear to be maintained.

2. In addition to the above prerequisites, the design of retrofitting projects for buildings located in the following areas must be certified by a licensed professional engineer or architect:

(a) V Zones,

(b) Floodways with velocities greater than 5 feet per second,

(c) Areas subject to any of the special hazards listed in Section 401.

3. In addition to the prerequisites in 531.a.1, structural flood control projects must meet the following prerequisites:

(a) The design and construction of the project must have been certified by a licensed professional engineer.

(b) The project must meet minimum environmental protection criteria.

(1) If the project was constructed on or after January 1, 1990, the community must document that all state and federal permits were obtained, including a Section 404 permit from the U.S. Army Corps of Engineers (or document that a 404 permit was not required).

(2) If the project was constructed before 1990, the community must document that the project would be approved if it went through an environmental review.

The environmental review standards are the standards currently used by the FEMA Regional Office to approve funding for flood control projects, such as drainage improvements. Each Regional Office can provide the community with its procedures for environmental reviews of new funding requests. The community can self-certify that the review criteria have been met.

(c) The responsible agency must be implementing an operations and maintenance plan that was prepared for the project by a licensed professional engineer.

(d) The community must be enforcing development regulations that prevent or minimize the impact of future development on the project's flood protection level. These regulations can be either:

(1) Watershed-wide regulations that prevent increases in stormwater runoff. This can be documented by receipt of credit for stormwater management regulations under Activity 450 (Stormwater Management) (i.e., credit for SMR or SMP with an impact adjustment of 1.0). The design storm (DS) must be at least as large as the flood protection level for the project; or

(2) Regulations requiring new buildings in the regulatory floodplain to be protected to a base flood elevation based on a fully developed watershed. This can be documented by receipt of credit for either an appropriate freeboard (FRB) under Activity 430 (Higher Regulatory Standards) or a flood study based on future conditions hydrology (ADS) under Activity 410 (Additional Flood Data).

These prerequisites assure FEMA that CRS credit is provided for projects that are properly designed and well maintained.

b. Retrofitting technique used (TU) (Maximum credit: 2,800 points)

TUi = the value of TU for building i. The value of TU is based on the retrofitting technique used.

1. For elevated buildings:

   TU = 1.0 if the building is elevated

2. For buildings that are dry floodproofed (i.e., the walls and floor are made watertight so floodwater does not enter the building):

   TU = 0.6 if the project was designed by a licensed engineer or architect and the design accounts for openings and internal drainage, seepage, and underdrainage.

   TU = 0.4 if 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 (i.e., any floor below grade on all sides).

   TU = 0.2 for all other cases, including those for which there is no documentation of how openings, interior drainage, seepage, or underdrainage are handled.

3. For buildings that are wet floodproofed (i.e., floodwater is allowed into the building, but measures are taken to minimize damage):

   TU = 0.5 if the project was designed by a licensed engineer or architect.

   TU = 0.3 if the project was not designed by a licensed engineer or architect.

   TU = 0.2 if the furnace, water heater, electrical breaker box, and other utilities are relocated above flood level.

4. For buildings that are protected from sewer or sump backup:

   TU = 0.2 if the building is located in the SFHA.

   TU = 0.1 for sewer backup prevention measures if 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. A maximum of 200 points is provided under this activity for sewer backup prevention measures outside of the SFHA.

The variation in the value for the technique used (TU) is based on the reliability of the project to prevent flood damage. For example, dry floodproofing is a less reliable retrofitting approach than elevation. Other methods and variations on these methods can be submitted for review to determine the credit points.

The credit is calculated for each protected building. When calculating TU, each building is represented by the letter "i." TU_i is the credit for the flood protection technique used to protect building "i." When the formulae are completed on the activity worksheets, TU_1 and FPI_1 are the credits for building #1, TU_{24} and FPI_{24} are the credits for building #24, and so on.

Credit is usually not provided for post-FIRM buildings because the NFIP already requires that they be protected. However, if a post-FIRM building was retrofitted to protect it from a flood hazard not covered by the FIRM or NFIP regulations, credit is provided under this activity.

An example of this would be the case of a post-FIRM building constructed to the base flood elevation shown on an old FIRM. The current base flood elevation is higher because of a recent restudy. If the building is elevated again to protect against the new base flood elevation, then the community could receive retrofitting credit. However, constructing a NEW building to meet the community's flood protection requirements is not retrofitting.

c. Structural flood control technique used (TU) (Maximum credit: 1,000 points)

TUi = the value of TU for building i. The value of TU is based on the structural flood control technique used. If more than one technique is used to protect a building, then TU = the lower of the techniques' values.

1. For buildings protected by a barrier, including a levee, berm, or floodwall, the following prerequisites must be met in addition to those in Section 531.a:

   (a) The barrier must be located entirely on the property of the owner of the protected building(s).

The reason for this requirement is to ensure that those who are protected will maintain the levee or floodwall. When a barrier protects several neighbors and one neglects maintenance, all the properties are in jeopardy.

A barrier entirely on property owned by a condominium association would be acceptable, while one on property owned by a homeowner's association that protects several privately owned homes would not. If the barrier is on land that does not meet this requirement, then the community should review the credit criteria in Activity 620 (Levee Safety) to see if it would qualify for that credit.

(b) The barrier must have no openings (e.g., access is gained by going over the wall), openings that close without human intervention, or a written plan and adequate warning time for available personnel to close the openings.

TU = 0.8 if the barrier was designed, and the construction approved, by a licensed engineer and the design accounts for interior drainage, seepage, and underdrainage.

TU = 0.4 if the barrier was not designed by a licensed engineer, but the design accounts for interior drainage, seepage, and underdrainage.

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)

FPIi = 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:

   FPIi = 1.0 if the building (and its utilities, duct work, etc.) have been elevated to one foot or more above the base flood elevation.

   FPIi = 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:

   FPIi = FPPi – FPBi where

   FPIi = 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 feet 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)

PB = Σ(TUi x FPIi). 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 (TUi x FPIi) for any single building is 1.0 (i.e., the building was elevated (TUi = 1.0) and it was elevated to one foot above the base flood level (FPIi = 1.0)).

Summing the factors for each building is shown in the formula with the mathematical symbol "Σ" (sigma). These calculations are simpler to understand and compute in the activity worksheets.

NOTE: *See Section 504 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.

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.

This activity provides extra credit for those properties on the list that have been protected. If they are in the regulatory floodplain, they are simply listed twice on the activity worksheet, AW-530-2, and noted as "repetitive loss." If they are not in the community's regulatory floodplain, they are listed once.

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).

$TU_{1-2} = 1.0$

FPP1-2 = 0.8, FPB1-2 = 0

FPI1-2 = FPP1-2 – FPB1-2 = 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.

$TU_{3-4} = 1.0$

FPI3-4 = 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 it reaching these buildings. The other buildings in this floodplain, closer to the channel, are still subject to flooding by the 25-year flood.

$TU_{5-14} = 0.7$

FPP5-14 = 0.5, FPB5-14 = 0

FPI5-14 = FPP5-14 – FPB5-14 =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.

532 Impact Adjustment

a. Option 1:

rPB = 0.15 x 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. The maximum value for rPB is 3.0 (i.e., 20 buildings have been protected)

If the community uses Option 1, it will receive 4.2 points for each protected building. 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 x 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 x rPB

Example 533-1. Someburg uses Option 1 for the impact adjustment::

rPB = 1.95

c530 = 28 x 1.95 = 54.6, 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 x 3.53 = 98.84, 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 600 buildings in Bigtown's regulatory floodplain. This project protects 400 that had been flooded twice in the last 20 years from the 75-year flood.

$TU_{1\text{-}400} = 0.8$

FPP1-400 = 0.8, FPB1-400 = 0.3

FPI1-400 = FPP1-400 – FPB1-400 =0.8 – 0.3 = 0.5

$TU_{1\text{-}400} \times FPI_{1\text{-}400} = 0.8 \times 0.5 = 0.4$

PB = 400 x 0.4 = 160

Using Option 2: bSF = 600

$$rPB = \frac{100 \times 160}{600} = 26.67$$

c530 = 28 x 26.67 = 746.76, rounded to 747

534 Credit Documentation

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

a. Documentation that demonstrates that each project meets the prerequisites as described in Section 531.a:

   1. For all projects:

      (a) All required permits were obtained or the local permit official states in writing that the project complies with all federal, state, and local codes and regulations.

      (b) Protection is provided to at least the 25-year flood level.

      (c) If human intervention is required, there is at least one hour of warning time.

      (d) The project was completed after the effective date of the initial FIRM.

      (e) The building or project is in good condition.

   2. For retrofitting projects: If the building is in a high hazard area, the design was certified by a licensed professional engineer or architect.

   3. For flood structural flood control projects:

      (a) The design and construction were certified by a licensed professional engineer.

      (b) The project meets the minimum environmental protection criteria.

      (c) The responsible agency is implementing an operations and maintenance plan what was prepared for the project by a licensed professional engineer.

      (d) The community is enforcing development regulations that prevent or minimize the impact of future development on the project's flood protection level.

These prerequisites are discussed in Section 531.a. For some items, the documentation would be a copy of the permit, project plan, or ordinance. In other cases, a local official may have to certify that a prerequisite has been met.

b. Documentation for each protected building that is appropriate to the type of flood protection technique used.

1. For retrofitting projects:

(a) For elevated buildings, a elevation certificate should be provided.

(b) For retrofitting projects other than elevation, AW-530-3 and AW-530-4 are optional forms that may be used.

(c) If the retrofitting project was a substantial improvement or was made to a substantially damaged building, the documentation must also show that the project was implemented pursuant to a community action other than routine enforcement of the National Flood Insurance Program requirements, such as providing financial assistance or declaring a dilapidated structure to be unsafe and uninhabitable.

Examples of AW-530-3 and AW-530-4 appear in Figures 530-1a and 530-1b.

Credit is not provided for requiring new, substantially improved, or substantially damaged buildings to meet the minimum requirements of the NFIP. However, credit is provided if a community action causes a pre-FIRM building to be brought up to post-FIRM standards.

2. The documentation for structural flood control projects must show:

(a) The level of flood protection for each building to be credited, both before and after the project was installed or constructed.

(b) [For buildings protected by a reservoir, detention basin, retention pond, or other facility that stores water above ground] that the structure meets all state dam safety requirements. This is done with a letter from the state dam safety office. If there is no state dam safety office, then a licensed professional engineer must certify that the project meets all appropriate dam safety criteria.

There must be documentation on each building. A channel modification or reservoir that lowers the 25-year flood level of the stream may still leave many buildings exposed to flooding by the 25-year flood.

c. A map showing the location of all protected buildings for which credit is being applied.

1. If the building is on FEMA's repetitive loss list, it may be located anywhere in the community.

2. If the building is not on FEMA's repetitive loss list, it must be located in the SFHA as shown on the Flood Insurance Rate Map (FIRM) or in the regulatory floodplain as shown on the Impact Adjustment Map prepared in accordance with Section 403.

This map is not necessarily the same as the Impact Adjustment Map prepared pursuant to Section 403. It need only show the part of the community in which buildings have been protected. The map for this activity does not need to show lot boundaries, unless the same map is used for Activity 520 (Acquisition and Relocation).

d. [If the community is using Option 2 under Section 532.b] Calculations showing the total number of buildings in the SFHA (bSF).

NOTE: *The variable bSF must have the same value as bSF in Activities 520, 610, and 620.*

e. [If the community is applying for credit for protecting buildings located outside the SFHA] Documentation that shows that floodplain regulations are in effect in the area outside the SFHA.

As noted in Section 524.e, this documentation requirement ensures that Community Rating System (CRS) credit is provided only for actions taken to mitigate damage to genuinely floodprone properties.

535 For More Information

a. Copies of the following publications are available free from

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

1. Comprehensive and detailed reviews of retrofitting:

Above the Flood: Elevating Your Floodprone House. FEMA-347, 2000.
http://www.fema.gov/library/fema347.htm

Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding. FEMA-312, 1998.
http://www.fema.gov/mit/rfit/

Design Manual for Retrofitting Flood-prone Residential Structures, FEMA-114, September 1986.

Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings, FEMA-259, 1995.

2. Additional references on elevating a building:

Elevated Residential Structures, FEMA-54, March 1984.

Coastal Construction Manual, FEMA-55, Third Edition, 2000.

Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas, FEMA-257, October 1994.

Manufactured Home Installation in Flood Hazard Areas, FEMA-85, September 1985.

Openings in Foundation Walls, FIA-TB-1, April 1993.

Free-of-Obstruction Requirements, FIA-TB-5, April 1993.

Below-Grade Parking Requirements, FIA-TB-6, April 1993.

3. Additional references on wet and dry floodproofing:

Floodproofing Nonresidential Structures, FEMA-102, May 1986.

Flood-Resistant Materials Requirements, FIA-TB-2, April 1993.

Non-Residential Floodproofing—Requirements and Certification, FIA-TB-3, 1993.

Protecting Building Utilities From Flood Damage, FEMA-348, 2000.
http://www.fema.gov/library/lib06b.htm

Wet Floodproofing Requirements, FIA-TB-7, December 1993.

b. These Corps floodproofing publications can be found on the following website:

http://www.usace.army.mil/inet/functions/cw/cecwp/NFPC/nfpc.htm

Hard copies can be ordered from

U.S. Army Corps of Engineers, Tulsa District
Flood Plain Management Services
1645 South 101st East Avenue
Tulsa, Oklahoma 74128
(918) 669-7197
fax: (918) 669-7546
carolyn.schultz@usace.army.mil

1. Overviews of retrofitting issues:

   Flood Proofing Techniques, Programs and References, February 1991.

   Flood Proofing: How to Evaluate Your Options, July 1993.

   Local Flood Proofing Programs, June 1994.

   Flood Proofing Performance—Successes & Failures, 1998

2. Additional references on elevating a building:

   Raising and Moving The Slab-On-Grade House, 1990.

   A Flood Proofing Success Story, September 1993.

   Flood Proofing Technology in the Tug Fork Valley, April 1994.

3. Additional references on wet and dry floodproofing:

   Flood Proofing Systems & Techniques, December 1984.

   Flood-Proofing Regulations, EP 1165 3 314, June 1995.

c. The U.S. Army Corps of Engineers can provide technical information and advice on retrofitting techniques to interested communities and individuals. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps.

d. 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.

e. Several states have published their own floodproofing or retrofitting manuals and some have programs to help fund or otherwise assist property owners.

f. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. It offers a five-day course on retrofitting techniques oriented to engineers and experienced building professionals. Stipends to cover travel, registration, and rooms are usually available from FEMA. For more information, call EMI at 1-800-238-3358 or your state emergency management agency's training office.

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RETROFITTING WORKSHEET COMMUNITY: Anytown

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: 123 Memory Lane
Anytown

Permit record. EITHER: Permit # 94-32 Date of Permit: 6/3/94 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. Check either:

X 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. Check either:

X The building is NOT located in a V Zone, floodway with velocity > 5 feet per second, or an area subject to special hazard.

___ 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)

X 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)

Activity Worksheet AW-530-3 Edition: 2002

Figure 530-1a. Example worksheet for documenting a retrofitting project (AW-530-3).

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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 0 - year flood FPB = 0.0

After the retrofitting project, the building was protected from the 50 -year flood FPP = 0.8

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 = 0.4 FPB = 0.0 FPP = 0.8

✓ This property is on the FEMA repetitive loss list.

Comments:_____

I certify that the items checked above are correct to the best of my knowledge:

Name (signed): Bill D Best

Name (printed): Bill D Best Date: 7/12/02

Activity Worksheet AW-530-4 Edition: 2002

Figure 530-1b. Page two of an example worksheet for documenting a retrofitting project (AW-530-4).

Figure 530-2. Retrofitting Techniques

General: Retrofitting is one of several ways to protect a building from flood damage. It involves modifications made to a building or to the property to prevent or reduce flood damage. Other approaches include acquisition of the building, relocating it out of harm's way, and construction of a levee, reservoir, or other project to keep water away from the property. Retrofitting is different from other approaches because the building site itself remains subject to flooding; it is the building that is modified to prevent or minimize flood damage.

Activity 530 (Retrofitting) recognizes five approaches to retrofitting:

1. Elevating the building so that floodwaters do not enter or reach any damageable portions of it,

2. Constructing barriers between the building and floodwaters,

3. Dry floodproofing to make the building walls and floor watertight so water does not enter,

4. Wet floodproofing to modify the structure and relocate the contents so that when floodwaters enter the building there is little or no damage, and

5. Preventing basement flooding from sewer backup or sump pump failure.

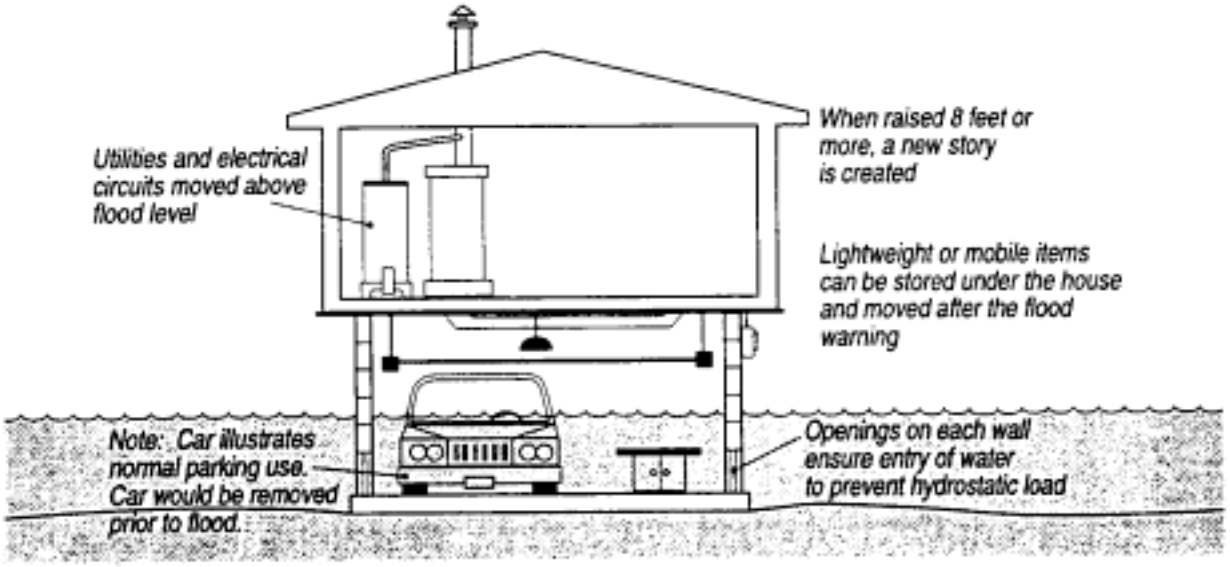
"Human intervention" is a commonly used retrofitting term. It refers to the need for a person to be at the site to take the action needed to make the retrofitting system work. For example, if a floodwall will only provide protection if someone closes a door or turns on a pump, it is considered to need human intervention. Measures that need human intervention are considered less dependable, especially if there is little warning time. Similarly, floodwalls and dry floodproofing projects that rely on human intervention or an outside source of electricity are not as dependable as elevation or other methods that continuously provide flood protection.

It should be noted that any retrofitting project must comply with the local building and floodplain management codes. If the cost of the retrofitting project and related work exceeds 50% of the value of the building, then the project is considered a substantial improvement and the building must be brought up to post-FIRM construction standards. This means that a residential building must be elevated to or above the base flood elevation.

Elevation: Short of removing it from the floodplain, the best way to protect a house or other structure from surface flooding is to raise it above the flood protection level.

Floodwaters can then flow under the building, causing little or no damage. This protection technique is required for new and substantially improved buildings in floodplains and is commonly practiced in flood-prone locations throughout the country.

There are many qualified house-moving contractors who know the techniques for elevating a building. The building is jacked up and set on cribbing while a new foundation is built underneath. The foundation is raised to the flood protection level and the house is lowered back down. Utility liens are extended and reconnected, steps are built, and sometimes the perimeter is backfilled or landscaped to mask the change.



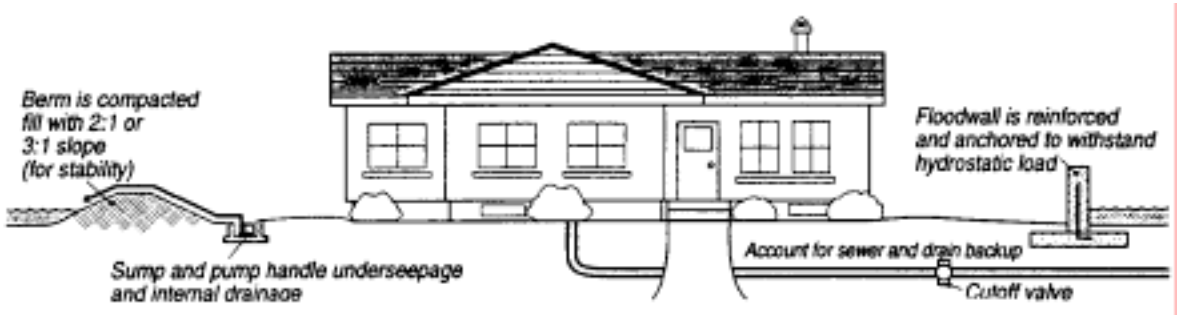
If the flood protection level is low, the result of elevation is a house similar in appearance to one on a 2- or 3-foot crawlspace. If the house is raised 2 feet, the front door would be three steps higher than before. If the house is raised 8 feet, the lower area can be wet floodproofed for use as a garage, access, or for limited storage of items not subject to flood damage.

Barriers: Barriers keep surface waters from reaching a building. There are three types of barriers: levees (earthen walls), floodwalls (made of concrete or steel), and berms (grading or filling an area, usually with local soil).

The strength of levees comes from their mass. The standard design is 3 horizontal feet for each vertical foot (3:1 slope). Providing a 1-foot width at the top results in a need for 6 to 7 feet of ground for each foot in height. Therefore they need a lot of room.

Concrete, masonry, or steel structures are used where there is not enough room for a berm or levee. Concrete and masonry floodwalls should be built with internal reinforcing bars to provide strength and to resist cracking and settling over time. They must be properly anchored to withstand lateral hydrostatic pressure and care must be taken to ensure that they are watertight.

Access into the protected area can be complicated. If the slope is not too steep, pedestrians and vehicles can go over the wall. Some floodwalls have openings for driveways and sidewalks. Closing these openings is dependent on human intervention and is not appropriate where there is little warning time. If the slope of the wall is too steep, a stairway can be built over the wall to provide access without human intervention.



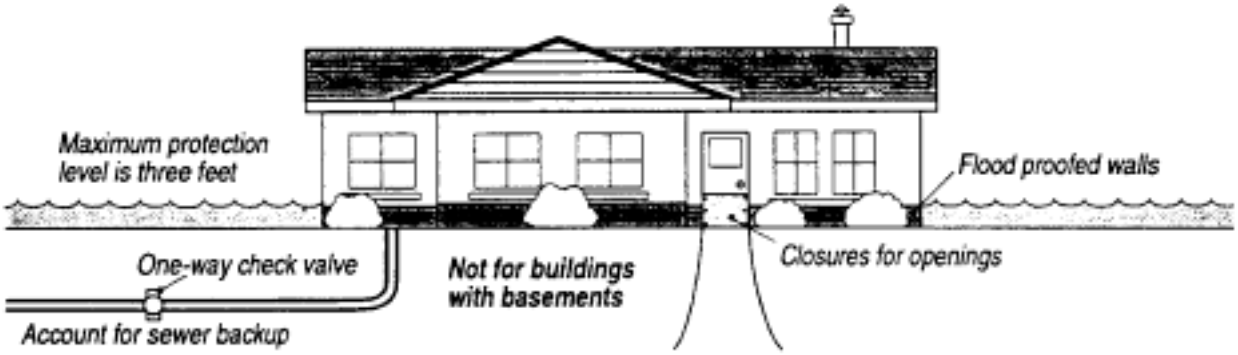
The barrier design needs to account for leaks, seepage of water under the wall, and rainwater that falls inside the floodwall perimeter. Therefore, a sump and/or drain tile is needed to collect the internal ground and surface water. A pump and pipe are also needed to pump the internal drainage over the barrier. A backup source of electricity is advisable because floods are often accompanied by storms and power outages.

Floodwalls, levees, and berms can either surround the building ("ring levee") or connect to high ground. One common approach is a floodwall that runs from high ground on one end of the house to high ground on the other end to protect a below-grade patio or walkout basement.

Dry floodproofing: This term covers several approaches to sealing up a building to ensure that floodwaters cannot get inside it. All areas below the flood protection level are made watertight. Walls are coated with a waterproofing compound or plastic sheeting. Openings, such as doors, windows, sewer lines, and vents, are closed, either permanently or with removable shields.

Dry floodproofing is only appropriate for buildings on sound slab foundations that are subject to less than 3 feet of flooding. Most building walls and floors are not strong enough to withstand the hydrostatic pressure from more than 3 feet of water.

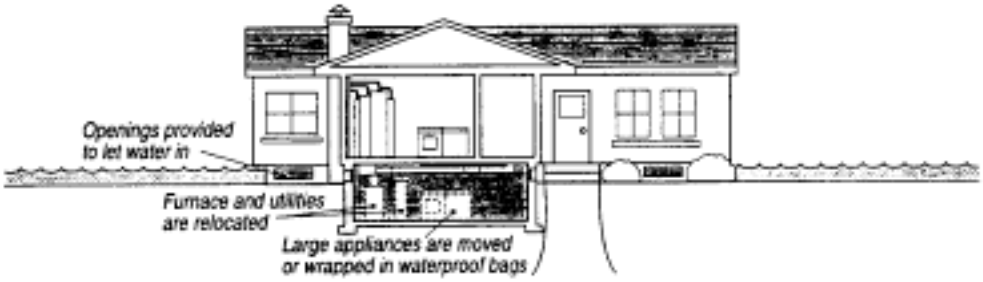
The degree of floodproofing can vary from simply applying a waterproofing compound to the walls and inserting a shield in the doorways to a more secure and attractive method. The more secure method involves coating the lower 3 feet of the outside walls with waterproofing compounds and plastic sheeting. This coating is covered to protect the waterproofing and to minimize disruption to the appearance. A drain tile sump and sump pump are installed at the base of the walls to handle underseepage. A backup source of electricity is important to prevent the buildup of water pressure during storms.



Dry floodproofing is not recommended for houses with floors below grade, such as basements and garden apartments, because the combination of hydrostatic and saturated soil pressure can collapse the walls or buckle the floor. This technique is not as desirable as a floodwall that will keep floodwaters from reaching the building. However, where there is not enough space on the lot for a levee or floodwall, dry floodproofing may be the only alternative.

Wet flood floodproofing: Outside floodwaters and saturated soil against a basement put the equivalent pressure of 7 to 8 feet of water on the wall and floor (more than 500 pounds per square foot). Most walls are not built to withstand lateral pressure of more than 3 feet of standing water (200 pounds per square foot). As a result, watertight basement walls and floors may be cracked, buckled, or broken by the pressure of floodwater and saturated soil.

One way to deal with this is to let the water in and remove everything that could be damaged by a flood. This is called wet floodproofing. Wet floodproofing covers several approaches to modifying a building to ensure that even though floodwaters are allowed inside, there is minimal damage to the building and contents. These approaches range from moving a few valuable items to rebuilding the floodable area of the building.



In the latter case, structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater, and laundry facilities are permanently relocated to a higher level. Where flooding is only 1 or 2 feet deep, these items can be raised on blocks or platforms.

Wet floodproofing is usually not used for one-story houses because the flooded areas are the living areas. However, many people wet floodproof their basements, garages, and accessory buildings simply by relocating all hard-to-move valuables, such as heavy furniture and electrical outlets. Light or moveable items, such as lawn furniture and bicycles can be moved if there is adequate time after the flood warning is issued.

Basement protection: In some communities, sewer backup and resulting basement flooding are bigger problems than overbank or surface flooding. Often they occur at the same time and many property owners are not sure how the water got into their buildings. Floodwalls and dry floodproofing projects need to account for backflow through the sewer lines and seepage of groundwater under the protective barrier during surface flooding.

Sewer backup: Sewer backup occurs during heavy rains. Stormwater flows into combined or separate sanitary sewers, overloading the system's capacity to carry the water to the sewage treatment plant. The water backs up through house service lines and floor drains and into basements.

Backed up sewage can be contained in the sewer lines with plugs, standpipes, overhead sewers, and backup prevention valves. Plugs and standpipes are placed in the floor drain. Bolts are tightened to seal rubber gaskets to the drain pipe. Although inexpensive, these two measures are not very dependable. If the sewer backup is over 2 or 3 feet deep, it will flow out of the next lowest opening, usually a laundry tub or toilet bowl.

An overhead sewer contains backed up sewer water in the plumbing system. A sump is installed under the basement floor to intercept sewage flowing from basement fixtures and the basement floor drain. The sewage is pumped out by an ejector pump in the sump. Plumbing fixtures on the first floor are not affected. They continue to drain by gravity to the sewer service line.

It is unlikely that the sewers will back up above the level of the overhead sewer line. If water does go higher, a check valve in the pipe from the ejector pump keeps it in the pipes. Backed up sewage is contained in the sewer pipes so there is no worry about overflowing laundry tubs or basement toilets.

A backup valve stops the water in the sewer pipes. Older versions of this approach were located in the basement and relied on gravity to close the valve. But if debris got caught in the flapper, the valve did not close tightly. Because of their unreliability, valves were discouraged and even prohibited in some communities.

The "balanced valve" has corrected these design shortcomings. A system of counterweights keeps it open all the time so debris cannot catch and clog it. When the sewer backs up, instead of relying on gravity, floats force the valve closed. It is usually installed in a manhole in the yard so there is less disruption during construction. The location also keeps the water pressure from breaking the pipes under the basement floor.

Sump backup: Many basements are protected from groundwater problems with drain tiles that direct groundwater into sumps. Sump pumps move the water from the sump out to the ground, away from the building. In some parts of the country, all new houses with basements are built with drain tile and sump pumps.

Very heavy rains can overload this system. Power outages and maintenance problems may knock out a sump pump. The outfall pipe may put the water too close to the house so the sump pump recycles the same water. Sometimes there is no outfall pipe and the sump pump sends the water into the sanitary sewer.

As a result of these problems, the system designed to keep groundwater out can act as a conduit to bring the water into a basement. Using larger or extra sump pumps, having backup sources of electricity during power outages, and redirecting the outfall, are measures that can be taken to correct this problem.

For More Information: See the references in Section 535.

Illustrations courtesy of *Flood Proofing Techniques, Programs, and References*, U.S. Army Corps of Engineers, 1996.

540 DRAINAGE SYSTEM MAINTENANCE

Summary of Activity 540

541 Credit Points. There are three elements in this activity for a maximum of 330 points (excluding special hazard credit).

a. Channel and basin debris removal (CDR): Up to 300 points are provided for inspecting the drainage system and removing debris. For the purposes of this activity, a community's drainage system consists of all natural and human-made watercourses, conduits, and storage basins that must be maintained to prevent flood damage to buildings from smaller, more frequent storms.

b. Stream dumping regulations (SDR): Up to 30 points are provided if the community has regulations prohibiting dumping in streams and ditches.

c. Coastal erosion protection maintenance (EPM): Credit points are provided for maintaining erosion protection programs in communities with coastal erosion-prone areas as described in *CRS Credit for Management of Coastal Erosion Hazards*.

542 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 community, the impact adjustment ratio for an element is 1.0.

b. Under Option 2, if the program is not implemented throughout all of the developed portions of the community, a default impact adjustment ratio of 0.2 may be used.

c. Under Option 3, if the program is not implemented throughout all of the developed portions of the community, the impact adjustment ratios may reflect the proportion of the community's drainage system that is affected.

543 Credit Calculation. The credit points for each element are multiplied by the impact adjustment ratios and their products are totalled.

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

a. A description of the drainage system and areas subject to the maintenance program, an explanation of the inspection and debris removal procedures, and records to document both the inspection and removal projects.

b. [Required if the community is applying for credit under 541.a.3] A copy or description of the capital improvements program, including
   1. A master list of the community's drainage maintenance problem sites;
   2. Recommended corrective measures for each problem site, and
   3. Documentation that funds are spent on improvements projects each year.

c. [Required if applying for credit for SDR under Section 541.b] A copy of the stream dumping ordinance or pertinent portion of the law.

d. [Required if applying for SDR under Section 541.b.2] A photo or photocopy of the "no dumping" sign OR a copy of the outreach project OR a note that the outreach project documentation is included in the documentation submitted for Activity 330 (Outreach Projects).

e. [If the community determines the impact adjustment factors using Options 1 or 3 (Sections 542.a and 542.c)] An Impact Adjustment Map that shows all channels and other drainage facilities in the developed portion of the community and identifies the channels and facilities covered by the channel and basin debris removal program.

f. Documentation demonstrating that the inspection and maintenance were performed according to the procedures submitted in Section 544.a.

545 For More Information.

540 DRAINAGE SYSTEM MAINTENANCE

NOTE: *A separate publication, CRS Credit for Drainage System Maintenance, 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 keeping the channels and retention basins of a community's drainage system clear of debris in order to maintain its flood carrying and storage capacity.

Background: An area's drainage system consists of natural drainageways or channels, human-made storm sewers and ditches, and detention/retention basins built along the system to store high flows. In many cases, the actual channel of a natural stream will carry only the two year flood, with the larger flows being carried in the overbank area. Engineered channels are designed to carry larger floods. When a drainage system loses a portion of its carrying or storage capacity, overbank flooding occurs more frequently and flows reach higher elevations.

Even where floodplain regulations prevent construction from encroaching, channels and detention basins can lose their carrying capacities due to debris accumulation, sedimentation, and the growth of vegetation.

One proven approach to preventing this is a community program to routinely inspect and clear debris from the drainage system. This work can be limited to removal of log jams, trash, fallen trees, shopping carts, trees growing in the channel, and similar debris that can dam a stream and cause flooding, even during small storms.

Activity Description: Under this activity, a community receives credit for inspecting its drainage system, removing debris, and correcting drainage problem sites. For the purposes of this activity, a community's drainage system consists of all natural and human-made watercourses, conduits, and storage basins that must be maintained in order to prevent flood damage to buildings from smaller, more frequent storms. In some communities, this will include streets, roadside ditches, underground storm sewers, and inlets, as well as open channels and detention and retention basins.

The sites of flood insurance and disaster assistance claims should be considered by the community in determining the extent of the local drainage system that deserves regular maintenance. In communities with repetitive losses (Category B and C communities), the drainage system MUST cover those areas having repetitive loss properties where the cause of the losses was due to local drainage problems or smaller, more frequent storms.

If the community does not inspect and maintain all parts of its drainage system, either because it does not have legal access to those parts on private property or for some other reason, it must use the impact adjustment to reflect the portion that it does maintain.

Each community must define its own drainage system for this activity. This is best done on a map with a narrative that is included in the drainage system maintenance procedures submitted with the CRS application (see Section 544.a.2).

The definition is based on what needs to be maintained in order to prevent damage to buildings. In some communities, it will be open channels and ditches. In a flat community, especially one protected by a levee, maintaining storm sewers, sewer inlets, and human-made canals may be vital to prevent flooding. In some areas of a community, roadside ditches are important conveyors of surface water and must be kept cleaned.

The implementing agency need not be the community. Many communities are in flood control or drainage districts that perform this work. However, no credit is provided for projects that rely on unsecured outside funding, such as a special appropriation from the state legislature or approval of a Corps of Engineers clearing and snagging project. Secure outside funding, such as an annual state distribution of gasoline tax receipts, is acceptable.

NOTE: *The NFIP requires that communities "must assure the carrying capacity within the altered or relocated portion of any watercourse is maintained" (44* ***CFR*** *60.3(b)(7)). This maintenance provision applies to any watercourse altered or relocated after the date of adoption of the community's floodplain management ordinance. Any natural growth or human-made debris that reduces the carrying capacity of these channels may be a violation of that ordinance. In addition, these areas may be remapped by FEMA to reflect the current carrying capacity and potential increased risk to existing development.*

This activity also credits regulations against dumping in the drainage system. Credit is available under Activity 330 (Outreach Projects) for advising people about the regulations and the need for open channels and cleared basins.

541 Credit Points

Maximum credit for Activity 540: 330 points.

a. Channel and basin debris removal (CDR) (Maximum credit: 300 points)

CDR = the total of the following points, except that no credit is provided unless the first item is credited.

1. 200, if the community's drainage maintenance program includes ALL of the following:

(a) An inspection is conducted at least once each year,

(b) An inspection is conducted after each storm that could adversely impact the drainage system,

(c) Inspections are conducted in response to citizen's complaints, and

(d) Action is taken after an inspection identifies a need for maintenance or cleaning.

2. 50, if the community's program identifies specific problem sites that are inspected and maintained differently or more frequently than other parts of the drainage system.

3. 50, if the community has an ongoing program, such as a capital improvements plan, to eliminate or correct problem sites or to construct "low maintenance" channels or other facilities. There is no credit for this item if the community does not spend money on a regular basis on such improvement projects (a one-time-only project would not be credited).

Credit is dependent upon regular inspection and maintenance. The community (or other non-federal agency) must have a program to regularly inspect its drainage facilities and remove debris as needed. Neither the cost of the work nor the amount of debris removed affects the credit. A program that simply responds to complaints is not eligible for this credit.

The maintenance work recognized by the first and second items is normally done by a public works crew, usually without heavy equipment. The objective is to remove accumulated debris like shopping carts and log jams.

The third item credited is not for an ongoing maintenance program, such as sediment removal. It is designed to recognize a program that makes structural or permanent changes to the channels or basins to reduce flooding or maintenance problems. Creditable examples would be ongoing programs to:

- Enlarge culvert and bridge openings to eliminate bottlenecks,
- Install permanent hard or soft bank protection measures,
- Install grates to catch debris during high flows,
- Build new retention basins to reduce flows into existing channels, or
- Convert problem channels into "low-maintenance" channels.

If an agency other than the community performs the inspection and/or debris removal, it is nonetheless the community's responsibility to document the activity for credit. In the case of a drainage district or county-wide maintenance program, the community may find it advantageous to

work with other affected communities and the larger agency to develop consistent documentation that can be used by all affected communities.

Example 541.a-1. Floodville's Public Works Department inspects all of the City's channels and retention basins. City crews remove critical accumulations of debris, such as log jams, that are found during the annual inspection and when problems are reported by neighboring residents. This work is done every winter: CDR = 200.
Over the years the crews have identified spots that are chronic problems, such as the culvert under the railroad on the unnamed ditch in the C Zone and spots on Foster Creek where ice jams usually form in late winter. The drainage maintenance procedures list these spots and require the crews to visit them first and more frequently during rains or ice breakup. The culvert under the railroad is inspected weekly and cleaned out as soon as debris is found. (CDR = 50).

Floodville does not have a formal program for funding channel improvement projects. Such work is done only if enough complaints are received and there is money left in the Public Works Department budget at the end of the fiscal year.

CDR = 200 + 50 + 0 = 250

b. Stream dumping regulations (SDR) (Maximum credit: 30 points)

SDR = either:

1. 15, if regulations prohibit dumping in the community's drainage system or

2. 30, if regulations prohibit dumping in the community's drainage system and the community publicizes the regulatory requirements.

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.

An ordinance that prohibits littering or similar general nuisance is not acceptable. The regulations must specifically address the problem of keeping channels clear of materials such as brush, fill, and items normally not covered in littering ordinances. Credit is not provided for ordinance language directed solely at water quality problems, or solely for construction in floodplains. The regulation must include the entire community for CRS credit.

To receive 30 points for SDR, the community must publicize the regulatory requirement. This may be through one of four kinds of outreach projects:

1. An outreach project to the community credited under OPC in Activity 330 (Outreach Projects),

2. An outreach project pursuant to the public information strategy (OPS) credited in Activity 330, provided the public information strategy document discusses publicizing drainage system maintenance,

3. An outreach project that advises all residents and businesses in the community about the regulations, but is not credited under Activity 330, or

4. Posting "no dumping in the stream" signs at key locations in the drainage system, such as frequent problem spots, schools, and public parks An example of a sign that has been used by several CRS communities is shown in Figure 540-1.

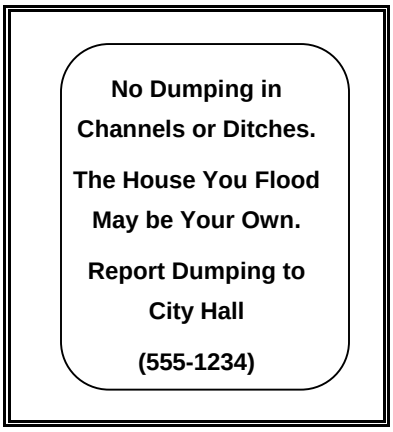


Figure 540-1.
"No dumping" sign.

Example 541.b-1. Article 21 of Floodville's code of ordinances deals with nuisances and misdemeanors. The article states that the police department is responsible for enforcement of listed violations. It also prescribes penalties.

Section 2113 of Floodville's code states:

> It shall be unlawful to dump, deposit, or otherwise cause any trash, landscape debris, or other material to be placed in any stream, channel, ditch, pond, or basin that regularly or periodically carries or stores water.

Floodville's documentation includes all appropriate sections of Article 21 with "SDR" marked in the margins. The City's outreach project to the community (OPC) discusses the need for drainage system maintenance and what to do if dumping is seen (see Figure 330-1): SDR = 30

c. Coastal erosion protection maintenance (EPM)

Credit for maintaining erosion protection programs in communities with coastal erosion-prone areas is described in *CRS Credit for Management of Coastal Erosion Hazards*. The credit points, cEPM, are added to the other elements in Activity 540.

The CRS encourages communities to devote special attention to areas affected by coastal erosion. Credit is available for maintaining measures that protect buildings from coastal flooding or erosion. These include dune or mangrove preservation, bluff stabilization, and beach nourishment programs. There are several prerequisites to this credit which are described in *CRS Credit for Management of Coastal Erosion Hazards* (see Appendix E).

542 Impact Adjustment

a. Option 1:

If all of the community's drainage system is maintained in accordance with Section 541.a, the community may use rCDR = 1.0.

b. Option 2:

If any part of the community's drainage system is maintained in accordance with Section 541.a, the community may use rCDR = 0.2.

c. Option 3:

aDC = area of the developed portion of the community.

$$rCDR = \frac{aCDR}{aDC}$$

Linear measurements can be more accurate and easier to calculate than areas, so feet or stream miles may be used for aCDR and aDC. If linear measurements are used, aDC = the total length of the streams and ditches in the developed portion of the community and aCDR = the total length of those reaches subject to the program.

To receive full credit for this activity, the community must maintain all of the surface drainage system, as defined in its procedures, not just channels in the floodplain. (See "Activity Description" at the beginning of this activity for the definition of a drainage system.) This type of program is usually implemented throughout the community and the impact adjustment ratio (rCDR) is 1.0 (Option 1).

If an element is implemented in only part of the community, the community must either use the default value, rCDR = 0.2 (Option 2), or determine the impact adjustment ratio (Option 3). In Option 3, rCDR is computed by dividing the area affected (aCDR) by the area of the developed portion of the community (aDC). The value for aDC excludes undeveloped areas where there are few buildings to protect.

This activity does not need to be conducted in undeveloped or sparsely developed areas. If a county (or other community with a large proportion of rural area) does not maintain channels in undeveloped or sparsely developed areas (e.g., areas with minimum lot sizes of 1 acre or more), or where no buildings would be affected by a lack of maintenance (e.g., on steep ravines), it may exempt those areas from the aDC calculations.

One way to identify such areas is on the Impact Adjustment Map described in Section 403. If the map has areas designated as open space or low density zoning, then the community need not implement this activity there. See Sections 402 and 403 for more information on marking the map for

areas of open space and low density zoning. Other designations of undeveloped areas may be submitted by the applicant.

If the community's program does not maintain the streams, ditches, basins, etc., in all developed areas, then the impact adjustment measurements (aCDR) must exclude those areas not maintained. The two most common reasons for not maintaining a developed area are that the streams or facilities are on private property and that environmental regulations or practices prohibit removing new growth or natural debris.

Note that the CRS is not intended to encourage communities to look at flood protection in isolation from other equally important local concerns, such as habitat preservation. However, if a facility is not maintained for whatever reason and damage to buildings could result, the lack of drainage system maintenance must be reflected in the impact adjustment.

Note also that the definition of the drainage system for CRS credit is related to damage to buildings. The denominator (aDC) includes only developed areas. If an unmaintained stream is in an area where no buildings would be affected, such as a park or farmland, those areas should be excluded from both the numerator and denominator and there would be no point reduction through the impact adjustment.

543 Credit Calculation

a. cCDR = CDR x rCDR

b. c540 = cCDR + SDR + cEPM

Example 543-1. As discussed in Section 541, the value of CDR for Floodville is 250. The program is implemented throughout the City: rCDR = 1.0.

cCDR = CDR x rCDR = 250 x 1.0 = 250

The City has an ordinance that prohibits dumping in streams and ditches. The prohibition against dumping is publicized in an annual flyer (see Figure 330-1). SDR = 30.

cEPM = 0 (There is no coastal erosion in Floodville.)

c540 = cCDR + SDR + cEPM = 250 + 30 + 0 = 280

During the verification visit, the ISO/CRS Specialist visits five sites on Floodville's drainage system. At one site, there is a car body with a tree at least two years old growing up through it. Therefore, the ISO/CRS Specialist visits 10 more sites. Two of the next 10 have bridge openings clogged with sediment and vegetation growing in the sediment that is more than a year old. The ISO/CRS Specialist can credit only 12 of the 15 sites sampled (80%).

Floodville's verified credit for CDR is 80% of the maximum possible credit:

CDR = 250 x 0.8 = 200.

c540 = 200 + 30 + 0 = 230.

544 Credit Documentation

The community must submit the following:

a. The procedures, instructions, or other documents that explain the community's routine inspection and debris removal program. The document(s) must:

   1. Identify who is responsible for the various aspects of the maintenance program,

   2. Describe the community's drainage system and the areas subject to the maintenance program. If the community uses impact adjustment Options 1 or 3, this description must include a map of the surface drainage system in the community's developed areas,

   3. Explain the procedures for inspection, including when regular inspections are conducted and how soon inspections are conducted after a complaint or a storm, and [if applying for credit under 541.a.2] specific problem sites that are inspected and maintained differently,

   4. Explain 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. Include the records that are kept to document both the inspections and the removal projects.

The document(s) should be a description of the community's program. It should be descriptive rather than detailed and need not exceed several pages. In some cases, the description will be in several documents, such as a job description, field procedures manual, memorandum of agreement with another agency, contract for canal mowing, drainage system map, forms used for records, etc..

The description document(s) must include five items.

1. Identification of who is responsible. This may include agencies other than the community's public works department, such as a drainage district (responsible for larger canals) or the

state highway department (responsible for highway bridges and culverts). The community is still responsible for providing the materials needed to verify the program.

2. A description of the community's drainage system, the areas covered by the program, and a description of the types of channels (e.g., natural or human-made). These descriptions are only needed for the developed portions of the community. If the community uses Options 1 or 3 to determine the impact adjustment, the description must include a map of all open channels and storage basins in the developed area and show which ones are subject to the maintenance program (see Section 544.e). The drainage maintenance staff must have access to the property to conduct inspections and to perform the maintenance unless the community has the legal authority to order the owners to correct the problems.

3. The procedures for inspection, including when regular inspections are conducted and how soon inspections are conducted after a complaint or a storm. If the community is applying for credit under 541.a.2 for identifying specific problem sites and inspecting and maintaining them differently or more frequently, then those sites and the inspection procedures also need to be included in the procedures.

4. The debris removal procedures, including how soon after an inspection an area must be cleared and what can and cannot be removed. The procedures may be different for different streams. For example, they may call for the public works department to remove downed trees and underbrush from human-made ditches but to leave them in parks or natural areas. Simply stating that "problems are corrected" or "debris is removed" is not an adequate description of what actions are to be taken for the different types of materials that may be found.

5. Records kept for the inspections and subsequent actions.

Examples of such procedures are presented in *CRS Credit for Drainage System Maintenance* (see Appendix E).

b. [Required if the community is applying for credit under 541.a.3] Excerpts from the capital improvements program or other documentation that shows the community (or other drainage maintenance agency) has an ongoing program to reduce drainage maintenance problems. The submittal must include:

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 (544.a.2).

2. Recommended correction measures for the problem sites.

3. Documentation that funds are spent on improvement projects each year.

The master list could be of problem sites or choke points submitted in relation to the credit under 541.a.2, provided the community intends to "eliminate or correct the problem sites." In other words, the list must be related to the capital improvements program. It cannot just be a list of problems that are not slated for an improvement project.

The list can be prepared from master watershed plans, complaints, or reports from maintenance crews. Projects do not have to be prioritized or listed in any order. For example, the community may determine which projects will be funded at the beginning of each fiscal year.

Credit can only be provided if the projects are tied to the community's drainage system as defined in its drainage maintenance procedures (Section 544.a.2). Projects to improve road drainage or storm sewers can only be credited if the roadside ditches or sewers are identified in the community's procedures and regularly inspected and maintained.

If the program is administered by a county or multi-community district (i.e., an organization outside the community's jurisdiction), then the list must be prepared from master watershed plans and not solely on complaints or other ad hoc basis.

The recommended correction measures for the problem sites do not need to be the result of detailed plans or studies. They may be one sentence statements on the most likely approach (e.g., "enlarge culvert," "bank stabilization," etc.).

The documentation that funds are spent on projects each year may be in the form of a multi-year capital improvements budget or line items in several years' budgets that fund drainage improvement projects.

c. [Required if the community is applying for credit under Section 541.b] Stream dumping ordinance or law regulating disposal of debris in the affected 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. The acronym SDR must be marked in the margin of the ordinance section pertaining to this element.

d. [If the community is applying for credit under 541.b.2.]:

   1. An annual outreach project to the community credited under OPC in Activity 330 (Outreach Projects),

   2. An annual outreach project pursuant to the public information strategy (OPS) credited in Activity 330, provided the public information strategy document discusses publicizing drainage system maintenance,

   3. An annual outreach project that advises all residents and businesses in the community about the regulations, but is not credited under Activity 330, or

4. Posting “no dumping in the stream” signs at key locations in the drainage system, such as frequent problem spots, schools, and public parks

e. [If the community determines the impact adjustment ratios using Options 1 or 3 (Sections 542.a and 542.c)] An Impact Adjustment Map that shows all channels and other drainage facilities in the developed part of the community and identifies which channels and facilities are covered by the channel and basin debris removal program.

If the community does not submit a map with its application, Option 2 will be used for the impact adjustment.

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

f. Documentation demonstrating that the inspections and needed maintenance were performed according to the procedures submitted in Section 544.a.

These records should be detailed in the CDR procedures described as the fifth item in Section 544.a. Typical documentation includes time sheets and work order forms that show follow up to inspection reports.

When the ISO/CRS Specialist makes the verification visit, a field survey may be conducted to verify that the channels and basins have been maintained in accordance with the community’s procedures. See the discussion in Section 232.d.

545 For More Information

a. The following document is available at no cost (see Appendix E).

CRS Credit for Drainage System Maintenance.

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. *Stream Obstruction Removal Guidelines*, American Fisheries Society, 1983. Copies are available for $8 plus shipping from the American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814.

600 FLOOD PREPAREDNESS ACTIVITIES

Activities in this series are usually coordinated at the local level by the emergency manager. They include actions that should be taken to minimize the effects of a flood on people, property, and building contents. The first activity, 610 (Flood Warning Program), covers flood warning, emergency response, and evacuation plans for the entire community. The other two activities ensure that flood protection structures do not exacerbate the damages caused during a flood.

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610 FLOOD WARNING PROGRAM

Summary of Activity 610

611 Credit Points. There are five elements in this activity for a maximum of 225 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 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 flood 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 (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.

d. [Required if applying for SRC credit] A copy of the StormReady or TsunamiReady recognition letter from the NWS

If the community experienced a flood during the year, it must submit the following with its annual recertification:

e. 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.

Additional credit is available depending on the community's program for actions to be taken after an impending flood is identified. A "flood response plan" is the name given in this activity to the document that describes these activities. It may have different names in different communities, such as "flood warning plan," "flood preparedness plan," or "flood annex" to a multi-hazard plan. The plan must have been adopted by the community's governing board.

Three elements provide credit points for the flood response plan:

- Dissemination of the warning to the general public;
- Implementation of specific tasks to reduce or prevent threats to health, safety, and property, such as controlling evacuation routes, restricting access to flooded areas, and maintaining vital services; and
- Coordination of flood warning and response activities with operators of critical facilities, such as hospitals and hazardous materials companies.

NOTE: *The community must have a warning dissemination program in order to receive credit for the flood response plan.*

611 Credit Points

NOTE: *Unless the documentation requirements described in Section 614.a are met, no credit will be provided for this activity.*

Maximum credit for Activity 610: 225 points.

a. Flood threat recognition system (FTR) (Maximum credit: 40 points)

Credit is provided if the community has a system that provides an early notice of a flood for at least one location within the community. The notice must be generated by meteorologic and/or hydrologic data. The system must be able to forecast specific flood conditions in the future.

1. Prerequisites: To receive credit for this element:

(a) The data collection, communications, and data analysis components of the flood threat recognition system must be regularly maintained and tested at least annually; and

(b) The community must submit descriptions of the flood hazard and the flood threat recognition system.

2. Credit points: FTR = the total of the credit points in either (a) or (b) as follows:

   (a) If the flood threat recognition system is operated by a federal, state, or other agency other than the community, FTR = the total of (1) and (2), as follows:

      (1) 20, if the community demonstrates in its documentation that it is prepared to receive and react to flood warnings on a 24-hour basis. The information received must be specific to one or more sites on each river in the community and include flood elevations and arrival times (or other specific data appropriate for warning); and

      (2) Either:

         ((a)) 5, if a manual technique is used to predict downstream arrival time and peak flow or elevations; or

         ((b)) 20, if a computerized flow or storm surge prediction model (e.g., HEC-2 or HUREVAC) is used to analyze the data to produce more locally pertinent flood threat information. This model may be either a "real-time" model run during the flood, or maps, charts, and other output from a model that provides detailed data for points other than those specifically forecast in Section 611.a.2(a)(1).

The flood threat recognition system lets local officials know that a flood is coming. It should also enable estimates to be made of the time of onset of flooding and crest height. Under 611.a.2(a)(1), credit for flood threat recognition is provided if the community documents that, on a 24-hour basis, it monitors, and is ready to react to, notification systems, such as:

- River stage reports from the National Weather Service, U.S. Army Corps of Engineers, or other agency that monitors river stages [FTR = 20].

- Reports from the National Hurricane Center [FTR = 20].

- Reports from an IFLOWS (Integrated Flood Observing and Warning System) system that rainfall in the watersheds above the community will cause the river to crest at a certain stage at a certain time at a specific location within the community [FTR = 20].

- Reports from the West Coast & Alaska Tsunami Warning Center (WC/ATWC) or the Pacific Tsunami Warning Center (PTWC) [FTR = 20]

Under 611.a.2(a)(2), credit is provided if the community documents that a computer model will allow the site-specific forecast provided through 611.a.2(a)(1) to be extended to other locations within the community:

- Using a flood profile produced by computer modeling (e.g., the profile in the community's flood insurance study) and a contour map to determine the area along the river that will be inundated by the flood that has been forecast. [FTR = 20 + 20 = 40]

- Using SLOSH inundation maps to convert a forecast from the National Hurricane Center to a predicted area of inundation throughout the community. [FTR = 20 + 20 = 40]

- Using a forecast peak flow at one point on a river from the National Weather Service or an IFLOWS system and the HEC-2 backwater model to produce a map of inundation areas throughout the community. [FTR = 20 + 20 = 40]

(b) If the flood threat recognition system is operated by a local, state, or other nonfederal agency, FTR = the total of the credit points in (1), (2), and (3) as follows:

(1) Either:

((a)) 15, for a collection system based on precipitation and/or river gage data that are manually read and reported (e.g., by volunteer); or

((b)) 20, for an automated precipitation and/or river gage data collection and reporting system (e.g., IFLOWS, ALERT, or comparable system);

(2) 10, if the density of the gage network is at least one per 10 square miles, or if all upstream tributaries with more than 10 square miles are gaged; and

(3) Either:

((a)) 5, if a manual technique is used to predict downstream arrival time and peak flow or elevations; or

((b)) 10, if a verified digital flow prediction model is used to analyze the data collected to predict downstream arrival time and peak flow or elevations.

Flood threat recognition systems creditable under 611a.2(b) include:

- Monitoring upstream river and rain gages by volunteers, neighboring communities, or others who report the data to an emergency operating center or other location [15 points] where the data are reviewed and flood predictions are made using graphs and charts [5 points for a manual technique to predict arrival times and peak flows].
  [FTR = 15 + 5 = 20]

- Operating or participating in an ALERT, IFLOWS, or similar system. ALERT or IFLOWS systems consist of remote river and rainfall gages and a communication system that transmits the gage data to a microprocessor [20 points]. A hydrologic model converts the river and rainfall data to a flood prediction [10 points].
  [FTR = 20 + 10 = 30]

It does not matter which agency provides the flood forecast to the community. What counts is that a knowledgeable person in the community is responsible for receiving information and making or communicating a locally useful flood prediction. Monitoring the NOAA (National Oceanic and Atmospheric Administration) Weather Radio and hearing that low-lying portions of several counties can expect flooding is not creditable under the CRS unless the community has its own followup system of monitoring and predicting flood levels.

Each system must have a schedule of maintenance, drills, and/or other training appropriate to its needs. An ALERT system usually has automatic daily tests, while a manual gage-reading system may only need an annual drill. The community's documentation must explain how and when the flood threat recognition system is maintained and updated (see Section 614.a.3).

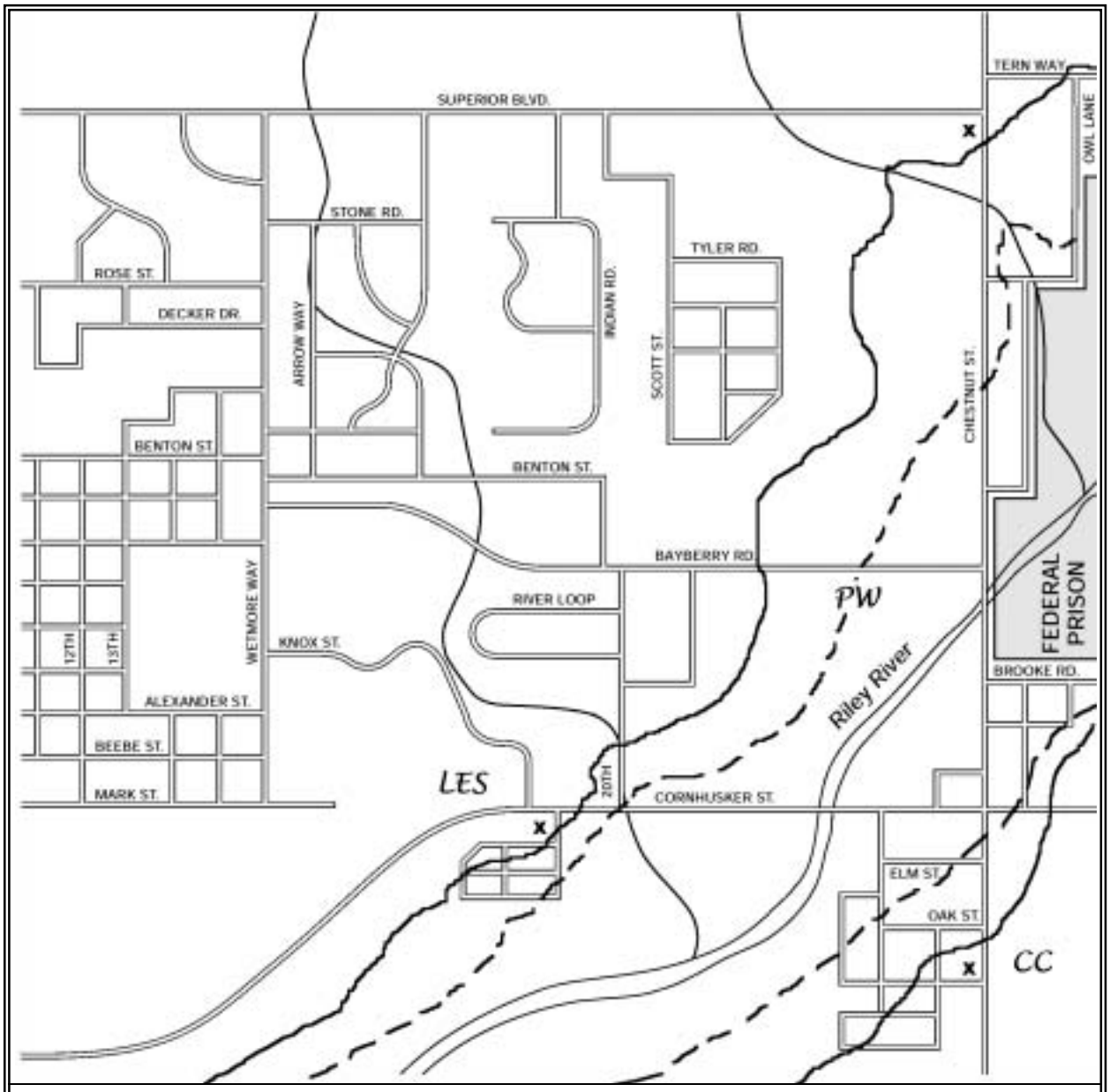
If a system does not cover all of a community's sources of flooding, the areas affected are factored in during the impact adjustment. The impact adjustment is based on the number of buildings in the Special Flood Hazard Area (SFHA) that are affected (see Section 612).

Example 611.a-1. Watertown is flooded by three streams as shown in Figure 610-1: two small streams that are not mapped as having an SFHA, and the Riley River. The following text is included in Watertown's description of the flood threat recognition system as required by Section 614.a.3:

> Watertown obtains warnings of flooding on Riley River from NOAA Weather Radio. The broadcasts include a stage predicted for the gage at the Cornhusker Street bridge. The emergency manager uses the flood stage forecast map (Figure 610-1) to determine what other areas will be affected by the predicted flood.
>
> Broadcasts are monitored 24 hours a day by personnel at the police dispatch center. Because the radio is continuously monitored, there are no special procedures for testing. Maintenance is performed under contract with a local electronics store.

This system receives 20 points under 611.a.2(a)(1) for receiving and acting on National Weather Service warnings and 20 points under 611.a.2(a)(2)(b) for using the map to provide flood data for other points in the community.

FTR = 20 + 20 = 40.



Riley River Flood Stage Forecast Map

Flood stage 32 feet
Flood stage 36 feet (base flood)

×	Sandbag distribution point
PW	Public works garage
CC	First Christian Church
LES	Lincoln Elementary School

Figure 610- 1. Watertown's flood stage forecast map.

b. Emergency warning dissemination (EWD) (Maximum credit: 60 points)

This element credits arrangements for disseminating a flood warning to the public.

1. Prerequisites:

   (a) The community must receive credit for the flood threat recognition system (if FTR = 0, EWD = 0 and c610 = 0).

   (b) The community must have adopted an emergency response plan, and the items for which EWD credit is requested must be in that plan or in appendices or procedures adopted or developed as part of that plan.

   (c) The warning must be disseminated in ways that can reach people in a timely manner, including at night or in heavy storms. If the warning lead time is under 12 hours, it is not sufficient to rely only on radio and TV announcements.

   (d) The warning dissemination equipment and procedures must be tested at least annually.

   (e) The community must publicize the warning procedures at least annually. This may be done by using an outreach project credited under elements OPC, OPF, or OPS of Activity 330 (Outreach Projects) or a project that is not credited by the CRS but that reaches at least 90% of the properties in the floodplain. The publicity must cover the topics of flood warning and flood safety discussed in Section 331. If an OPS is used, the public information strategy document must discuss the best way to publicize warning and safety information to the target audience.

2. Credit points: EWD = the total of the following points if these measures are specified in the adopted plan:

   (a) 10, for having an adopted policy that specifies when and how a warning is issued and what messages will be used. The policy must provide adequate guidance to allow staff to quickly issue appropriate warnings;

   (b) 15 for either an outdoor voice-sound system or a fixed siren system;

   (c) 30 for dissemination of warnings by door-to-door contact or mobile public address systems;

   (d) 10 for warning dissemination through the Emergency Alert System;

   (e) 15 for a telephone system that reaches all floodplain residents;

   (f) 10 for warning dissemination using a cable television override system; and

   (g) 10 for local AM radio transmitters used for public announcements.

   (h) Additional points may be possible for warning systems not listed. Communities should submit requests for such credit to their ISO/CRS Specialist.

The emergency response plan must be adopted by the governing body of the community. Specific items for which EWD credit is applied must be included in the adopted plan. The term "plan" includes annexes and standard operating procedures (SOPs) that may be developed pursuant to the plan, but without specific adoption. It is a standard procedure for such a plan to require the development and frequent revision of such SOPs without formal adoption of each procedure and revision.

A community may include redundant warning dissemination systems in its flood response plans that total more than 60 points, but no more than 60 points are provided for this element. Credit is provided for either an outdoor voice-sound system or a fixed siren system, but not both.

To receive credit for this element, the community must receive credit for FTR under Section 611.a. The documentation must show that the warning will reach people in a timely manner. In areas subject to flooding with little lead time, sirens or fixed or mobile public address systems may be necessary.

In areas with longer warning lead times, slower methods such as telephone calling trees and going from door to door may be appropriate. Often areas subject to hurricanes and coastal storms can expect more than 24 hours of warning lead time. In these cases, radio and television announcements would suffice.

The warning equipment and procedures must be tested at least annually. Each approach should have its own appropriate testing schedule. Sirens and emergency alert systems are often tested weekly or monthly. A system that relies on telephone calling trees needs a provision for updating at least annually.

The community must conduct one or more annual outreach projects that may be credited under Activity 330 (Outreach Projects) as outreach projects to the community (OPC), to floodplain residents (OPF), or pursuant to a public information program strategy (OPS) that determined the most appropriate way to advise people about the warning system. The project must cover flood warning and flood safety as discussed in Section 331. An outreach project used for this publicity requirement must be sent to at least 90% of the target audience.

Example 611.b-1. Watertown's emergency response plan describes its warning dissemination system. The plan includes guidance on what warnings to issue and to whom when the Riley River is predicted to reach different stages [10 points for the warning policy]. When the flood threat recognition system shows that the river is expected to exceed a flood stage of 30 feet, the City sounds its sirens, which are located throughout the community [15 points for a fixed siren system]. The police dispatcher also activates the Emergency Alert System and advises area radio stations about the hazard [10 points for use of the Emergency Alert System]. Different messages are used based on the predicted flood stage.

Sirens are tested on the first Monday of each month. The Emergency Alert System is tested every six months. Maintenance of the sirens and communications equipment is provided for by contracts with the manufacturers. A flood exercise is conducted every two years. In the other years, a different type of disaster is used to exercise the City's emergency response program.

The Police Department also sends a squad car along streets in the Riley River floodplain to warn residents with its public address system. The squad cars are used daily, so there is no special testing. They are maintained by local car dealers according to a preventive maintenance schedule [30 points for mobile public address system].

EWD = 10 + 15 + 10 + 30 = 65.

Because the maximum value for EWD is 60, EWD = 60.

c. Other response efforts (ORE) (Maximum credit: 50 points)

This element credits the other flood response efforts in the community's flood response plan.

1. Prerequisites:

   (a) The community must receive credit for the flood threat recognition system and for disseminating a flood warning to the general public (if FTR = 0 or EWD = 0, ORE = 0).

   (b) The community must conduct at least one exercise of the response plan each year. The exercise may be a table top exercise, drill, or response to an actual disaster. If the flood response plan is part of a multi-hazard plan, then the exercise may be in response to another disaster provided the parties and tasks involved are substantially the same.

2. Credit points: ORE = the total of the credit points in (a), (b), and (c) as follows:

   (a) 20, if the adopted plan is keyed to specific predicted flood levels or other appropriate data furnished by the flood threat recognition system;

   (b) 10, if the adopted plan identifies responsibility for flood response tasks for the community's staff and other public and private organizations; and

   (c) 20, if the adopted plan includes a summary of the estimated staff, equipment, supplies, and time required for each flood response task and the sources of the necessary resources.

Flood response tasks are assignments to be implemented by personnel within the local government, in other agencies (e.g., state police), and the private sector (e.g., contractors, volunteers, or the Red Cross). To receive full credit for this element, the tasks must be specific and flood-related. This level of detail is likely to be in an appendix or standard operating procedure attached to the plan.

Example 611.c-1. Watertown's emergency manager prepared a Flood Stage Forecast Map for Riley River, shown in Figure 610-1. Its flood response plan is keyed to predicted flood crests at the river gage on Cornhusker Street. At the predicted 32-foot stage, a flood will reach buildings south of Cornhusker and the city's Public Works garage. At the predicted 36-foot stage, the Cornhusker and Chestnut Street bridges will become impassable. The following are some of the city's flood response tasks:

32-foot stage predicted:

Police Department: direct evacuation out of the identified areas.

Fire Department: move two trucks and one ambulance to other side of river, so the entire town can be covered if the bridges are closed.

Public Works Department: sandbag the public works garage.

The Streets Department, Public Information Officer, other departments, and other agencies in the community, such as utility companies and the Red Cross, also have specific assignments.

36-foot stage predicted:

Police Department: direct evacuations.

Public Works Department: move all moveable equipment to high ground.

As noted under the example for EWD, Watertown's response plan is much more detailed than this example indicates. The EWD example also demonstrates that the town has a schedule for drills and exercises for its emergency response plan.
[20 points for keying response tasks to predicted flood levels and 10 points for itemizing flood response plans by the responsible department, agency, or organization. ORE = 20 + 10 = 30.

d. Critical facilities planning (CFP) (Maximum credit: 50 points)

This element credits warning and coordinating with operators of critical facilities. Critical facilities are defined in Section 130.

1. Prerequisites:

(a) The community must receive credit for the flood threat recognition system and for disseminating a flood warning to the general public (if FTR = 0 or EWD = 0, CFP = 0).

(b) The community must update the information on its critical facilities at least annually.

2. Credit points: CFP = the credit points as follows:

(a) CFP1 = 10, if the adopted plan includes the names and telephone numbers of the operators of all critical facilities affected by flooding. This information must be updated at least annually;

(b) CFP2 = 20, if the adopted plan includes arrangements for providing special warnings or early notifications directly to all facilities that need them; and

(c) CFP3 = 20, if the critical facilities needing them have their own flood response plans that have been developed, reviewed, or accepted by the community.

As with the other elements of this activity, the community must receive credit for its flood threat recognition system in order to receive credit for this element.

See Section 130, Glossary, for the definition of "critical facilities" used to determine CRS credit. The community's flood response plan must list the facilities considered critical in a flood. Facilities not subject to flooding generally do not need to be addressed, although in some cases loss of access can cause a critical situation. Other facilities in flood-free sites may be needed to support the flood response effort (e.g., sandbag suppliers and shelters to house evacuees).

More credit points are available if the community provides warnings tailored to the needs of its critical facilities. The timing and type of notice would depend on the facility and its needs. For example, an industrial complex where there is a lot of noise may need a direct telephone call because no one would hear a siren. Another facility may need an early notice in order to get ready. To obtain the 20 points, the community does not need to provide a special warning to all critical facilities, only all of those identified in the flood response plan as needing one.

More credit is provided if there are flood response plans for individual critical facilities. The plans may be developed by the community or developed by the facilities' operators and reviewed by the community. The facilities' plans should include flood response tasks similar to those credited under Section 611.c, Other Response Efforts.

Example 611.d-1. Watertown's multi-hazard plan lists all critical facilities in the community, their operators, and their telephone numbers. The list is updated by the emergency manager every six months [CFP1 = 10 points].

There are three critical facilities affected by flooding of the Riley River: the Public Works garage, the First Christian Church, and Lincoln Elementary School. The first is in the floodplain and the last two are adjacent to the floodplain but are needed for the flood

response plan. The City's plan includes providing special warnings to these three facilities [CFP2 = 20 points].

e. StormReady community (SRC) (Maximum credit: 25 points)

This element credits a local government that has been designated by the National Weather Service (NWS) as a StormReady or a TsunamiReady community.

1. Prerequisites:

   (a) The local government must receive credit for a flood threat recognition system operating within its jurisdiction. (if FTR = 0, SRC = 0).

   (b) The flood warning program must be able to forecast the arrival time and peak flow or elevations of floods.

2. Credit Points: SRC = 25 points for obtaining and maintaining the designation as a National Weather Service StormReady community.

The National Weather Service established the StormReady and TsunamiReady programs to help local governments improve the timeliness and effectiveness of hazardous weather related warnings for the public. By participating, local agencies can earn recognition for their jurisdiction by meeting the guidelines established by the NWS in partnership with federal, state, and local emergency management professionals.

The StormReady and TsunamiReady programs have communications and educational requirements that go beyond the traditional CRS requirements. Therefore, CRS credit is awarded to local governments that receive credit for flood threat recognition (FTR) and are designated by the NWS as a StormReady or a TsunamiReady community.

Example 611.e-1. Watertown was designated by the National Weather Service as a StormReady community on November 1, 2000. [SRC = 25 points]

612 Impact Adjustment

There is no impact adjustment for SRC because the program applies to the entire community.

a. Option 1:

1. If the flood threat recognition system, the warning dissemination system, and the flood response tasks cover the entire SFHA, rFTR, rEWD, and rORE = 1.0.

2. If all critical facilities affected by flooding have their own flood response plans, rCFP3 = 1.0.

There is no impact adjustment for CFP1 and CFP2. If the community's program does not cover all critical facilities affected by flooding, then CFP1 and CFP2 = 0. There is an impact adjustment for CFP3 based on whether all (Option 1) or some (Option 2) of the critical facilities have their own flood response plans.

b. Option 2:

1. If the flood threat recognition system, the warning dissemination system, and the flood response tasks cover less than the entire SFHA, rFTR, rEWD, and rORE = 0.25.

2. If only some of the critical facilities have their own flood response plans, rCFP3 = 0.25.

c. Option 3:

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):

$$rFTR = \frac{bFTR}{bSF} \quad rEWD = \frac{bEWD}{bSF} \quad rORE = \frac{bORE}{bSF}$$

rFTR and rORE cannot be greater than 1.0. rEWD cannot be greater than rFTR.

In most cases, a flood warning program is implemented throughout the community. This includes the regulatory floodplain and B, C, D, or X Zones that are not mapped for flooding. Where a community implements a warning program that serves everyone in the SFHA, the impact adjustment variables for those elements are 1.0.

Sections 301 through 303 discuss determining impact adjustment ratios based on buildings, including the variable bSF.

Example 612.c-1. Watertown's SFHA is limited to the Riley River floodplain. Its flood warning and response program for Riley River covers the entire SFHA. Therefore, the city uses Option 1: rFTR, rEWD, and rORE = 1.0.

613 Credit Calculation

a. cFTR = FTR x rFTR

b. cEWD = EWD x rEWD

c. cORE = ORE x rORE

d. cCFP = CFP1 + CFP2 + (CFP3 x rCFP3)

e. c610 = cFTR + cEWD + cORE + cCFP + SRC

Example 613-1. Watertown's flood warning and flood response program is described in the previous sections:

FTR = 40	rFTR = 1.0	cFTR = FTR x rFTR = 40 x 1.0 = 40
EWD = 60	rEWD = 1.0	cEWD = EWD x rEWD = 60 x 1.0 = 60
ORE = 30	rORE = 1.0	cORE = ORE x rORE = 30 x 1.0 = 30
CFP1 = 10 CFP3 = 0	CFP2 = 20	cCFP = CFP1 + CFP2 + (CFP3 x rCFP3) = 10 + 20 + (0 x 0) = 30
SRC = 25		cSRC = 25

c610 = cFTR + cEWD + cORE + cCFP + SRC = 40 + 60 + 30 + 30 + 25 = 185

614 Credit Documentation

The community must submit the following documentation with its application:

a. A description of the community's flood threat recognition system. The following items must be included and the margins must be marked so these items can be located by the reviewer. If the community is only applying for credit for a flood threat recognition system under Section 611.a, only items 1 and 3 need to be submitted. Mark the document as indicated:

   1. A description of the flood hazard ("flood hazard").

   2. A description of the areas affected by flooding and the impact of flooding on those areas ("flood impact").

3. A description of the system used to recognize and evaluate an impending flood ("flood threat recognition system" or "FTR").

4. Flood warning lead times for each stream or body of water covered by the program ("flood warning times").

This documentation is the basis for providing the community with credit for this activity. If the documentation is incomplete, does not address the elements' credit criteria, or is not adequately marked, the community may not receive all the credit points that its program deserves.

NOTE: *The community's staff may be asked to complete a questionnaire on its flood warning program to facilitate verification of this activity.*

The following provides guidance on what documentation is needed:

1. A description of the flood hazard: There must be a discussion of the nature of the flood hazard. A description that meets the criteria for step 4, "assess the hazard" items (a)(2)and (a)(3) for a floodplain management plan will usually suffice (see Section 511.a.4.(a)(2) and (3). The community may find it helpful to show the flood hazard area on a map of the community that shows the streams and other bodies of water that affect the community (see Figure 610-1). The description of the flood hazard in the community's Flood Insurance Study, which was provided to the community by the Federal Insurance and Mitigation Administration (FIMA) when the community received its Flood Insurance Rate Map (FIRM), will generally provide a good basis for this description.

Example 614.a-1. Watertown's Flood Stage Forecast Map is shown in Figure 610-1. The following text is included in Watertown's documentation:

> Watertown's primary threat of flooding is from the Riley River, which has a drainage area of 417 square miles. There are two smaller streams with drainage areas that are not large enough to be mapped as SFHA on the city's FIRM. Although Riley River occasionally floods during the summer and fall, the principal cause of flooding is spring snow melt. Attached is the Flood Stage Forecast Map for the Riley River (Figure 610-1).
>
> The duration of flooding varies depending on the cause of flooding. Summer thunderstorms immediately upstream of Watertown can cause the river to rise rapidly to a peak and to subside as quickly. Peak flows from thunderstorms farther upstream are attenuated as they move downstream. The peaks are lower, and the duration of flooding is longer. Flooding from snow melt and slow-moving winter frontal storms may persist for several days and have multiple peaks.
>
> In all cases, velocities are less than 5 feet per second. Flooding on the Riley River has included logs and other debris that increase the hazards.

2. A description of the areas affected and the impact of flooding on the areas: A flood threat recognition system should be tailored to the needs of an area. A description that meets the

criteria for step 5, "assess the problem," items (a) through (d) in a floodplain management plan will usually suffice (see Section 511.a.5(a)—(d)).

Example 614.a-2. The following text is included in Watertown's documentation:

> Areas in FIRM Zones A and B along the Riley River are subject to flooding. Major parts of these areas have been flooded at least six times in the last 50 years. The Chestnut Street bridge has sustained minor damage several times due to battering by debris.
>
> Within the area subject to overland flooding, properties subject to damage are primarily residential with a few commercial developments and one critical facility. The Riley River floodplain includes 86 houses and four non-residential buildings. There is only one critical facility in the Riley River floodplain, the city's Public Works garage.
>
> Damage in the past has included water damage to contents, battering of structures, and secondary losses due to disruption of utility services. Flooding of bridges and the Public Works garage has impeded response and recovery work.

3. A description of the flood threat recognition system: The description must demonstrate that the flood threat recognition system is timely and reliable enough to allow a reasonable opportunity to reduce the impact of the flood on the community and its residents. If the notice of impending flooding is provided by the National Weather Service or other federal agency, the description must state how the community receives the notice. If data are collected and analyzed by the community, state, or other non-federal agency, the system should be described in more detail.

Example 614.a-3. Watertown's description of the flood threat recognition system is included in the example in Section 611.a.

4. Flood warning times for each stream or body of water covered by the program: A response plan must be based on the amount of time the flood threat recognition system provides for the community to respond to the flood notification. Warning times can be estimated.

Example 614.a-4. The following text is included in Watertown's documentation:

> The flood predictions provided by the National Weather Service provide Watertown approximately 12 hours of warning in advance of flooding from events in the upper part of the Riley River watershed. Accurate and timely warnings cannot be provided for floods resulting from rain within 10 miles upstream of the community.

b. [Required if the community is applying for credit under Sections 611.b through d]:

1. Documentation that the flood response plan has been formally adopted by the community's governing board.

Many communities have prepared multi-hazard emergency response plans or comprehensive emergency management plans. Unless such a plan has a flood annex, standard operating procedures, or other parts that specifically address the community's flood problem, it may not be specific enough to qualify for CRS credit. For CRS credit, a flood response plan must specifically relate to the flood hazard and identify activities that respond to the flood threat at different predicted stages.

An effective date or adoption date on the cover of the plan or a copy of the minutes of the meeting at which it was adopted will suffice.

2. Copies of those portions of the plan or other documents demonstrating that the credit is appropriate. The CRS acronyms must be marked in the margins.

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 margin of the plan, and copies of only those pages should be submitted.

3. A copy of the materials that publicize the warning system. The publicity must 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 (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.

d. [If the community is applying for SRC credit] A copy of the StormReady recognition letter it received from the National Weather Service.

e. 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; and
8. Lessons learned and changes needed in the warning program and response plan.
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

a. The following publication is available at no cost (see Appendix E).

CRS Credit for Flood Warning Systems.

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 two 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, is available from FEMA, too. It can be downloaded from: http://www.fema.gov/pte/gaheop.htm

e. FEMA has independent study courses from the Emergency Management Institute through its website. See http://www.fema.gov/emi/crslist.htm.

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/

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.

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 portection 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. The certification must also provide the date of construction and the levee protection level.

b. The community's levee emergency response plan specifying actions to be taken 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 Community Rating System (CRS) 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.

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.

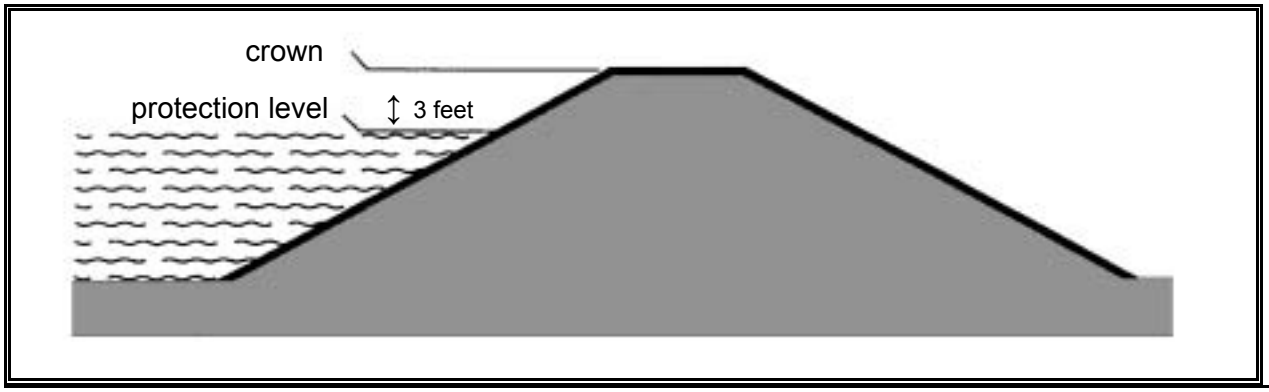


Figure 620-1. Levee protection level.

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 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 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.

b. The levee must have been constructed before January 1, 1991; and

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:

   1. Periodic patrols of the structure;

   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 621.c.1 through 621.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.

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:

$$rLP = \frac{bLP}{bSF}, \text{ where}$$

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 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 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.

d. [If the community determines the impact adjustment ratios using Options 2 or 3 (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):

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.

As an alternative to certification, the community may use a copy of the Corps' annual inspection report, provided that it rates the levee maintenance as "satisfactory" or "outstanding."

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; 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

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 the Federal Emergency Management Agency (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 response plan (DFP): Up to 100 points are provided for the community's dam failure emergency response 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 DFR or 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.

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. This is usually done 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 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.

State dam safety programs are scored based on a separate Schedule for State Dam Safety Programs, based on the standards outlined in the *Model State Dam Safety Program* developed by the Associa-

tion of State Dam Safety Officials (ASDSO) and published by FEMA as Publication 123. If the status of a state's dam safety program is unknown, the community should contact the FEMA Regional Office (see Appendix A). If a state program receives few or no points, it is hoped that local interest will encourage the appropriate state agency or legislature to improve the state program.

2. A community must meet state dam safety standards to receive credit for this element.

If a community owns or regulates the construction, operation, or maintenance of any dams, the community dam safety program must meet the state standards for dam safety in order for the community to be eligible for credit for this element. The separate dam safety Schedule requires states to advise FEMA when any community is in violation of the state's program.

Credit is provided for a community program that mitigates the threat to its floodplain properties from a failure of an upstream dam through emergency preparedness.

A community may also be eligible for credit under Activity 430 (Higher Regulatory Standards) if it requires new buildings to be protected from flooding caused by a dam failure.

631 Credit Points

Maximum credit for Activity 630: 175 points.

a. State dam safety program (SDS) (Maximum credit: 75 points)

SDS = up to 75 points, if the community is in a state with a dam safety program that has been accepted by FEMA for CRS credit. The state dam safety office must have stated that the community's program is in compliance with the state program.

This credit is available to all communities in states with acceptable dam safety programs, including communities that are not downstream of any dams. There is no impact adjustment for this credit. Credit is automatically provided. The value of SDS is determined by FEMA based upon its review of the state dam safety program.

Example 631-1. Riverview is in a state with a dam safety program that has been credited by FEMA for 50 points: The state dam safety office has confirmed that the City does not own or regulate any dams.

SDS = 50.

b. Dam failure emergency response plan (DFP) (Maximum credit: 100 points)

DFP = DFP1 + DFP2 + DFP3

1. DFP1 = 25, if the community has the following:

   (a) An emergency response plan that

      (1) Specifies that the community will be notified in the event of an impending or actual failure of a dam upstream from the community;

      (2) Provides projected inundation areas, flood elevations, and estimated arrival times for flood peaks arising from a failure of the dam; and

      (3) Calls 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) Monthly communication checks between dam operators and emergency services officials.

Credit for this element is patterned after Activity 610, Flood Warning Systems. The first sub-element, DFP1, provides credit if the community demonstrates that it is aware of the hazard and can be reasonably sure of being notified if a dam failure is imminent or has occurred. Credit for the other sub-elements is based on specific items in the community's emergency preparedness plan.

Emergency action plans (EAPs) are usually prepared by dam owners so that they and downstream communities understand the potential results of the generally unlikely event of a dam failure and prepare for them. A good EAP will discuss the different ways a dam may fail and the floods that will result if such failures occur. An EAP that qualifies for DFP1 credit must also include a hydraulic analysis that produces a dam failure inundation map, flood elevations, and arrival times at various points downstream from the dam.

If a community has a dam upstream that has no EAP, it can either prepare its own EAP or work with the State Dam Safety Office to require that the owner provide one.

The annual report by the dam operators must include any factors that have changed since the EAP that affect the safety of the dam or increase the likelihood of failure. Such factors might include the results of recent inspections, revisions to the hydrologic studies used to forecast possible dam

failures, revisions in the operation plans, and/or current conditions such as the water level of the reservoir and the snowpack in the watershed above the dam.

Example 631-2. Riverview has an adopted emergency response plan for the areas that would be affected by a failure of Safe Dam. It is based on an emergency action plan (EAP) prepared by the owner of Safe Dam. The owner has agreed by letter to provide a status report each March 1, when the reservoir of Safe Dam is normally at its highest level for the year. The plan specifies that the dam operator will contact the emergency manager once each month by radio and telephone to ensure that the established communications systems are in good order at all times. Riverview's emergency plan includes a provision for an annual exercise, although this exercise does not have to be based on dam failure.

DFP1 = 25.

2. DFP2 = 25, if the community has the following:

   (a) credit for DFP1, and

   (b) an adopted emergency plan that details at least three methods of notifying affected residents of an imminent flood event 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.
   - Emergency Alert System.
   - Cable television override.
   - Door-to-door notification.

Many communities have prepared multi-hazard emergency response plans or comprehensive emergency management plans. Unless such a plan has an annex, standard operating procedures, or other parts that specifically address the community's dam safety problem, it may not be specific enough to qualify for CRS credit. For CRS credit, a dam failure emergency response plan must specifically relate to the dam safety issue and identify appropriate response activities.

Because a dam failure is generally unexpected, and because the flood wave resulting from a dam failure can travel rapidly downstream, the warning dissemination methods appropriate for this hazard are those used in flash flood situations. In many cases, there will be only a few hours to evacuate, and in some cases, only minutes.

Example 631-3. Riverview's emergency response plan specifies four methods of warning dissemination:

DFP2 = 25.

3. DFP3 = 50, if the community:

   (a) Has credit for DFP1 and DFP2;

   (b) Has an 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

   (c) At least annually notifies occupants in the dam failure area of the hazard, the area affected, evacuation routes, and flood safety topics appropriate to the hazard.

Because dams failures are rare events, it is difficult for people to believe that they are in danger. It is necessary for them to receive repeated messages so that if the event occurs they understand that they have to act quickly. When the time comes, they also have to know what to do and where to go. Depending on the community's situation, they may have to put the family in the car and leave immediately, leaving animals to fend for themselves and leaving all of their possessions.

Facilities with special populations are a particular concern in this type of emergency. It is likely that the staff of such facilities do not have the ability to evacuate their students, patients, clients, inmates, etc. and will need extraordinary assistance to avoid a catastrophe.

Example 631-4. Riverview has worked with the local telephone company to get dam failure information published in the telephone directory. The entry includes the dam failure inundation map from the EAP, evacuation routes from their own emergency plan, and flood safety information appropriate for the 6 hours of warning expected in the event of a dam failure.

Riverview has three critical facilities within the dam failure inundation area. The emergency plan specifies that a day care center with a capacity of 50 children will be evacuated by a city-owned bus to the high school six blocks away. The three-story county hospital is outside the

100-year floodplain, and is subject to an estimated two feet of flooding in the event of a dam failure. Working with the Riverview emergency manager, the emergency power supply has been relocated and data processing and records departments were moved to the second floor. Inmates at the city jail will be evacuated to the federal prison outside of town using buses from the prison.

DFP3 = 50.

632 Impact Adjustment

There is no impact adjustment for SDS.

a. Option 1:

If the dam failure emergency plan covers all buildings in the SFHA, the impact adjustment ratio rDFP = 1.0.

b. Option 2:

If only some of the buildings in the SFHA are covered by the dam failure emergency plan, the community may use the default value rDFP =0.25.

c. Option 3:

The impact adjustment ratio rDFP is computed by dividing the number of buildings covered by the dam failure emergency response plan by the total number of buildings in the SFHA (bSF):

$$rDFP = \frac{bDFP}{bSF} \quad \text{where}$$

bDFP = the number of buildings covered by the dam failure emergency response plan.

bSF = the number of buildings in the SFHA.

rDFP cannot be greater than 1.0.

Example 632.1. Riverview is downstream from Safe Dam on Dang Creek. Even though the dam meets all the state's dam safety requirements and is well maintained, Riverview has developed a dam failure emergency response plan in conjunction with the dam operator. The area along Dang Creek subject to inundation is larger than the Special Flood Hazard Area (SFHA) for Dang Creek mapped on the Flood Insurance Rate Map (FIRM). It covers 192 buildings, of which 68 are in the SFHA: bDFP = 192.

Riverview's regulatory floodplain includes several other streams with dams upstream. These dams do not have emergency action plans, so Riverview does not have the information it

needs for dam failure planning. There are 150 buildings in Riverview's SFHA; bSF = 150.

$$rDFP = \frac{192}{150} = 1.28$$ The maximum value for rDFP = 1.0, rDFP = 1.0

633 Credit Calculation

a. DFP = DFP1 + DFP2 + DFP3

b. cDFP = DFP x rDFP

c. c630 = SDS + cDFP

Example 633-1.

a. From the examples in Section 631, SDS = 50, DFP1 = 25, DFP2 = 25, DFP3 = 50

   DFP = 25 + 25 + 50 = 100.

b. From the example in Section 632, rDFP = 1.0

   cDFP = 100 x 1.0 = 100

c. c630 = 50 + 100 = 150

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.

635 For More Information

a. 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, November 1997.

1989 Report on Review of State Non-Federal Dam Safety Programs, FEMA-188, 1990.

Suggested Procedures for Safety Inspection of Dams, Ohio Department of Natural Resources, 1987.

Dam Safety: An Owner's Guidance Manual, FEMA-145, 1987.

Emergency Action Planning for Dam Owners, FEMA, 1998.

Dam Inundation Mapping Pilot Study, FEMA, 1999.

FEMA's Dam Safety Office website: http://www.fema.gov/mit/damsafe/

b. 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*

700 COMMUNITY CLASSIFICATION CALCULATIONS

In this series, the credit points for each activity undergo final adjustment. In Section 710, the scores for mapping and regulatory activities are adjusted to reflect the community's rate of growth. The points for all the activities are then totaled in Section 720. Appendix C relates the community's total points to its Community Rating System (CRS) classification and flood insurance premium credit.

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710 COMMUNITY GROWTH ADJUSTMENT

Summary of Section 710

Activities related to new development are more important in growing communities than in communities with little or no pressure for future development in floodplains. In this section the 400 series' regulatory activities are adjusted to reflect the community's average growth rate.

711 Growth Data.

a. U.S. Census growth rate (USGR): USGR is the latest U.S. Census' average annual rate of population growth for the whole county. Use of this rate accounts for growth pressure throughout the area and for potential annexations. The U.S. Census data for a community can be obtained from the FEMA Regional Office.

b. Community growth rate (CMGR): CMGR is the growth rate of population or buildings that may be submitted by the community. This information must be taken from a growth rate accounting system used for state or federal reporting requirements. A community may want to submit a second growth rate if it is higher than USGR. If a second source is submitted, the two rates are averaged.

712 Growth Adjustment Calculation.

a. Average growth rate (AGR): AGR is an average of the values for growth data, USGR and CMGR, if used.

b. Community growth adjustment (CGA): The net result of this adjustment is to increase the credit points earned for the 400 series of activities in growing communities.

713 Credit Documentation. If the community wants the average growth rate to reflect a second source of growth data (CMGR), it must submit documentation that the second growth rate has been accepted by a state or federal agency.

710 COMMUNITY GROWTH ADJUSTMENT

Background: Activities related to new development are more important in growing communities than in communities with little or no pressure for future development in floodplains.

Activity Description: The 400 series' regulatory activities are adjusted to reflect the community's average growth rate. Community growth adjustment is applied by multiplying the number of points for the activity times the average growth rate.

711 Growth Data

Two sources of information can be used to determine a community's rate of growth.

a. U.S. Census growth rate (USGR)

The U.S. Census Growth Rate (USGR) is the latest U.S. Census' average annual rate of increase in the population of the whole county, including all incorporated cities and towns and unincorporated areas. Using this rate accounts for growth pressure throughout the area and for potential annexations.

The U.S. Census data for a community is provided by the Federal Emergency Management Agency (FEMA) Regional Office (see Appendix A) or the ISO/CRS Specialist. The growth rates provided to ISO by the FEMA Regional Offices will be used to calculate the community's Community Rating System (CRS) credit. If the community disagrees with the data, it must resolve the matter with its FEMA Regional Office.

b. Community growth rate (CMGR)

[Optional] CMGR is the growth rate of households or buildings that may be submitted by the community. This information must be taken from a growth rate accounting system that is used for state or federal reporting requirements (i.e., another agency has reviewed and accepted the approach). The minimum period for CMGR is five years. Annexation of developed areas may not be included as a source of growth. An incorporated municipality may use the U.S. Census growth rate for the community if it is higher than the USGR county growth rate.

A second source of growth data may be prepared by the community or a state agency. A community may want to submit a second growth rate if it is higher than USGR. If a second source is submitted, the two rates are averaged.

Many states have developed their own growth figures for formulae that are used to distribute grants or tax revenues. Whatever source is used, the data must have been reviewed and accepted by a state or federal agency.

The state or local growth rate data must represent construction of new insurable buildings in a community. Accordingly, data based on the annexation of areas already developed are not acceptable. Communities do not need to account for seasonal fluctuations in population.

712 Growth Adjustment Calculation

a. Average growth rate (AGR)

AGR, the average growth rate for the community, is an average of the values for growth data, USGR and CMGR, if used:

$$AGR = USGR \text{ or } \frac{USGR + CMGR}{2}$$

If AGR is less than 0.0, a value of 0.0 is used.

If AGR is greater than 5.0, a value of 5.0 is used.

Example 712.a-1. The FEMA Regional Office has advised Floodville that the Census' household growth rate for the county is 2.55: USGR = 2.55. The U.S. Census growth rate for the City of Floodville is 2.21. Because an average of the two will result in a lower growth rate, Floodville decides to use only USGR.

AGR = USGR = 2.55

b. Community growth adjustment (CGA)

CGA = 1 + (0.1 x AGR)

The net result of this adjustment is to increase the credit points earned by growing communities for activities in the 400 series. The maximum increase is 50%, which would apply to communities with average growth rates of at least 5.0 (5.0 is the maximum value for AGR). Communities that are losing population are not affected because AGR must be greater than or equal to zero. The growth rate figures are entered on activity worksheet AW-710.

Example 712.b-1. Floodville's AGR = 2.55.

CGA = 1 + (0.1 x 2.55) = 1.255 = 1.26

Floodville's credit points for Activities 410 through 450 are increased by 26%.

713 Credit Documentation

The community must submit the following documentation:

[Required only if the community wants the average growth rate to reflect a second source of growth data] If the community has growth rate data other than U.S. Census data for households or buildings, documentation that these data have been accepted by a state or federal agency for reporting requirements.

720 COMMUNITY TOTAL POINTS

At this step the points for all of the community's activities are totaled. The resulting total decides the community's CRS classification.

a. The scores for the 400 series activities are multiplied by the current value for CGA (from Section 710).

b. The results are totaled with the scores for the other activities to arrive at the community's total points (cT).

In this step, the points for all of the community's activities are calculated and totaled. The result is the community's total credit points (cT), which determines the community's Community Rating System (CRS) classification.

If the community does not have enough total points to attain a better class than it currently has, then it should apply for additional activities or elements. An application for a smaller number of points than that needed for an improved class will be returned.

The classes and the resulting flood insurance premium credits may be revised from year to year by FEMA based on experience gained in measuring the impacts of the activities. A current breakdown of credit points, the corresponding CRS classification, and the resulting premium credit appears as Appendix C.

Example 720.a-1. The verified scores for Floodville are computed below. Credit for the community growth adjustment (CGA) is included.

c310	=					97
c320	=					140
c330	=					209
c340	=					66
c350	=					43
c360	=					48
c410	=	228	x CGA	1.26	=	287
c420	=	240	x CGA	1.26	=	302
c430	=	107	x CGA	1.26	=	135
c440	=	68	x CGA	1.26	=	86
c450	=	0	x CGA	1.26	=	0
c510	=					108
c520	=					308
c530	=					99
c540	=					230

c610 =	0
c620 =	0
c630 =	0
cT = total of above	2,158

Floodville has enough points for a Class 6. It has met the Class 7 or better BCEGS prerequisite discussed in Section 211b, so it is verified as a Class 6. [Note that some of the examples for the activities were for communities other than Floodville.]

APPENDICES

Appendix A
FEMA REGIONAL OFFICES

REGION I

Connecticut, Maine, Massachusetts,
New Hampshire, Rhode Island, Vermont

FEMA Region I
J.W. McCormack POCH, Room 462
Boston, MA 02109-4595
(617) 223-9569
Fax: (617) 223-9574

REGION II

New Jersey, New York, Puerto Rico,
Virgin Islands

FEMA Region II
26 Federal Plaza, Rm. 1338
New York, NY 10278-0002
(212) 680-3620
Fax: (212) 680-3602

REGION III

Delaware, District of Columbia, Maryland,
Pennsylvania, Virginia, West Virginia

FEMA Region III
615 Chestnut St.
One Independence Mall, 6th Floor
Philadelphia, PA 19106-4404
(215) 931-5512
Fax: (215) 931-5501

REGION IV

Alabama, Florida, Georgia, Kentucky,
Mississippi, North Carolina, South Carolina,
Tennessee

FEMA Region IV
3003 Chamblee Tucker Rd.
Atlanta, GA 30341
(770) 220-5400
Fax: (770) 220-5440

REGION V

Illinois, Indiana, Michigan, Minnesota,
Ohio, Wisconsin

FEMA Region V
536 South Clark St., 6th Floor
Chicago IL 60635
(312) 408-5500
Fax: (312) 408-5551

REGION VI

Arkansas, Louisiana, New Mexico,
Oklahoma, Texas

FEMA Region VI
FRC 800 N. Loop 288
Denton, TX 76201-3698
(940) 898-5127
Fax: (940) 898-5195

REGION VII

Iowa, Kansas, Missouri, Nebraska

FEMA Region VII
2323 Grand Blvd., Suite 900
Kansas City, MO 64108-2670
(816) 283-7002
Fax: (816) 283-7018

REGION VIII

Colorado, Montana, North Dakota, South Dakota,
Utah, Wyoming

FEMA Region VIII
Federal Center, Bldg. 710
Box 25267
Denver, CO 80225-0267
(303) 235-4830
Fax: (303) 235-4849

REGION IX

Arizona, California, Hawaii, Nevada

FEMA Region IX
1111 Broadway St., Ste. 1200
Oakland, CA 94607-4052
(510) 627-7177
Fax: (510) 627-7147

REGION X

Alaska, Idaho, Oregon, Washington

FEMA Region X
Federal Regional Center
130 228th St., S.W.
Bothell, WA 98021-9796
(425) 487-4678
Fax: (425) 487-4613

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
ADS	411	additional data standards for floodplain mapping
aDC	542	area of the developed portion of the community
AFD	411	additional flood data
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
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
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 that have been acquired or relocated
bSF	303	number of buildings in the SFHA
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
CFR	310	*Code of Federal Regulations* (in the *Federal Register*)
CGA	711	community growth adjustment

Acronym	Section	Description
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
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
ERM	441	elevation reference mark 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
FIMA	113	Federal Insurance and Mitigation Administration
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
FTR	611	flood threat recognition system
FWS	411	more restrictive floodway standard

Acronym	Section	Description
GIS	441	geographic information system
HCP	511	Habitat Conservation Plan
HMGP	510	Hazard Mitigation Grant Program
ICC	431	Increased cost of compliance
ISO	113	The Insurance Services Office
LIB	351	flood protection library
LDC	431LD	land development criteria
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
NFS	411	non-FEMA share of the cost of a floodplain study
NGVD	130	National Geodetic Vertical Datum
NID	635	National Inventory of Dams
NOAA	631	National Oceanic and Atmospheric Administration
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
OPS	331	outreach project based on a strategy
ORE	611	other flood warning response efforts
OS	421	floodplain lands preserved as open space

Acronym	Section	Description
PB	531	protected buildings
PBi	531	protection credit for building “i”
PCF	431	regulations that protect critical facilities
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)
RFE	411	regulatory flood elevation
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
SMP	451	stormwater management master plan
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_i	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
WQ	451	stormwater management regulations for water quality
XXX	B-1	element acronym or variable number
XXXn	222	element number “n,” e.g., OPAn = OPA1, OPA2, and OPA3
YCM	441	number of years between checks of reference marks

Appendix C
COMMUNITY CLASSIFICATION POINTS

There are 10 community classes in the Community Rating System. Class 1 communities have the largest premium credit; residents of Class 10 communities receive no premium credit. Communities that do not apply for CRS classification are Class 10 communities.

The insurance premium credit is based on whether a property is in or out of the Special Flood Hazard Area (SFHA), i.e., the A and V Zones as shown on the community's Flood Insurance Rate Map (FIRM). The premium credit for properties in the SFHA increases according to the community's CRS class.

The credit for properties outside the SFHA is lower for Class 1–8 communities because premiums in these areas are already relatively low and can be lowered further through the Preferred Risk Policy. Also, most activities undertaken to qualify for those classes are implemented only in the floodplain. Because areas designated as A99 and AR Zones already receive an insurance premium reduction, these zones get the same premium reduction as non-SFHA areas.

A community's classification is based on the community total points (cT) as calculated on activity worksheet AW-720. The qualifying community total points, CRS classes, and flood insurance premium credits are shown below:

Credit Points (cT)	CRS Class	Premium Discount
4,500+	1	45%
4,000–4,499	2	40%
3,500–3,999	3	35%
3,000–3,499	4	30%
2,500–2,999	5	25%
2,000–2,499	6	20%
1,500–1,999	7	15%
1,000–1,499	8	10%
500–999	9	5%
0–499	10	0

SFHA (Zones A, AE, A1–A30, V, V1–V30, AO, and AH): *Credit varies depending on class.*

SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO): *10% credit for Classes 1–6; 5% credit for Classes 7–9.*

Non-SFHA (Zones B, C, X, D): 10% credit for Classes 1–6; 5% credit for Classes 7–9.

Preferred Risk Policies are not eligible for CRS premium discounts.

The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies. Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage.

Premium reductions are subject to change.

Appendix D
A Comparison of the Minimum NFIP Requirements and the CRS

The Community Rating System provides credits for exceeding the minimum requirements of the National Flood Insurance Program (NFIP). Many local officials are not sure whether their regulations exceed the NFIP requirements or just meet them. The minimum NFIP requirements for communities are spelled out in 44 *CFR* Parts 59–General Provisions and 60–Criteria for Land Management and Use. This Appendix compares these minimum requirements with specific CRS credits.

NFIP Requirement	Related CRS Credit
Part 59 General Provisions	
Subpart A - General	
59.1 Definitions	"Exceeding" the definitions for substantial improvement and substantial damage is recognized in Sections 431.c and d which credit cumulative substantial improvements (CSI) and lower substantial improvement thresholds (LSI).
59.2 Description of program	N/A
59.3 Emergency program	N/A
59.4 References	N/A
Subpart B - Eligibility Requirements	N/A
Part 60 - Criteria for Land Management and Use	
Subpart A - Requirements for Flood Plain Management Regulations	
60.1 Purpose of subpart	
(c) "Nothing in this subpart shall be construed as modifying or replacing the general requirement that all eligible communities must take into account flood, mudslide (i.e., mudflow) and flood-related erosion hazards, to the extent that they are know, in all official actions..."	In other words, the NFIP expects communities to exceed the minimum requirements.

NFIP Requirement	Related CRS Credit
(d) "The criteria set forth in this subpart are minimum standards..."	N/A
60.2 Minimum compliance with flood plain management criteria: describes the procedures for getting the local regulations approved.	N/A
60.3 Flood plain management criteria for flood-prone areas: the requirements in sections (a) - (e) are based on the type of flood data provided by FEMA.	
(a) When no flood data are provided by FEMA, the community shall:	
1. Require permits for development everywhere to determine if its in a floodprone area.	Section 411.a, regulatory flood elevation (RFE) credits identifying and regulating additional floodprone areas
2. Make sure proposed developments have permits from other agencies.	N/A
3. Make sure building sites will be reasonably safe from flooding. If in a floodprone area, new buildings and substantial improvements must be anchored, constructed with materials and methods resistant to flood damage, and have their utilities protected.	This NFIP requirement should not be confused with the credit for engineered foundations under Section 431.b (FDN).
4. New subdivisions must meet similar requirements.	N/A
5. New and replacement water systems must be protected.	N/A
6. New and replacement sanitary and septic systems must be protected.	Section 431.g, natural and beneficial functions regulations (NBR), credits prohibiting septic systems in the floodplain.

NFIP Requirement	Related CRS Credit
(b) When FEMA provides a flood map but no flood elevations, the community shall:	
1. Require permits for development in the A Zone.	Section 411.a credits providing regulatory flood elevations where not available (RFE). This would mean requiring permits in floodplains outside the A Zone.
2. Require development to meet the requirements in 60.3(a). 2-6.	N/A
3. Require larger subdivisions and developments to produce flood elevations.	Section 411.a (RFE) credits providing regulatory flood elevations for all new developments, not just large ones.
4. "Obtain, review and reasonably utilize" available flood elevations.	Section 411.a (RFE) credits providing regulatory flood elevations for all new developments, not just those where data are readily available.
5. Obtain and maintain records of the elevations and floodproofing protection levels of new buildings.	Activity 310 (Elevation Certificates) credits keeping the records on the FEMA elevation and floodproofing certificates.
6. Tell the State and other communities if a watercourse will be altered.	This requirement should not be confused with the credit in Section 431.g for stream bank protection (NBR).
7. Assure that the flood carrying capacity of an altered watercourse is maintained.	This requirement should not be confused with the credit in Section 431.g for stream bank protection (NBR).
8. Require that manufactured homes be elevated and anchored.	N/A
(c) When FEMA provides a FIRM with flood elevations, the community shall:	
1. Meet all the requirements of 60.3(b) in all types of A Zones.	N/A

NFIP Requirement	Related CRS Credit
2. Make sure that residential buildings and substantial improvements are elevated to or above the base flood elevation in those A Zones with flood elevations or depths.	Section 411.a credits providing regulatory flood elevations where not available (RFE). This results in requiring permits in A Zones without flood elevations or depths. Section 431.a, Freeboard, credits going higher than the base flood elevation.
3. Make sure that non-residential buildings and substantial improvements are elevated or floodproofed in those A Zones with flood elevations or depths.	See (c)2, above
4. Obtain an architect's or engineer's certification for floodproofing non-residential buildings.	Activity 310 credits certifications on FEMA forms. This language does not receive credit for engineered foundations (FDN) under Section 431.b.
5. Make sure that the areas below elevated buildings allow for the entry of water.	This is often confused with the credit for engineered foundations under Section 431.b (FDN), but it is a minimum NFIP requirement. Prohibiting enclosing the lower area is credited under Section 431.h (ENL).
6. Make sure that mobile homes outside of existing mobile home parks are elevated.	N/A
7. Require new and substantially improved residential buildings in AO Zones to be elevated above the specified depth or, where none is specified, two feet.	Section 431.a, Freeboard, credits going higher than the base flood depth. Section 431.a.7 notes that the two feet language is not eligible for freeboard credit.
8. Require new and substantially improved non-residential buildings in AO Zones to be elevated or floodproofed above the specified depth or, where none is specified, two feet.	See (c)7, above.
9. Require the standards of (a)1-4 and (b)5-9 in A99 Zones.	N/A

NFIP Requirement	Related CRS Credit
10. Make sure there is no cumulative increase in flood heights in areas with no floodway designated.	Section 411.b.2 credits new floodway mapping as additional data (ADS).
11. Require drainage paths around buildings in AH and AO Zones, areas of shallow flooding without defined channels.	N/A
12. Require mobile homes in existing mobile home parks to be elevated above the base flood elevation or at least three feet above grade.	Section 431n credits higher regulatory standards for existing manufactured home parks (MHP).
13. Apply for a conditional FIRM revision if a development will increase the base flood elevation by more than one foot.	Section 411.c credits a floodway standard more restrictive than one foot (FWS).
14. Require that recreational vehicles on a site for more than 180 days be treated as a manufactured home.	N/A
(d) When FEMA provides a floodway map, the community shall:	
1. Meet all the requirements of 60.3(c).1-14.	N/A
2. Adopt a regulatory floodway that does not result in increasing the base flood by more than one foot.	Section 411.c credits a floodway standard more restrictive than one foot (FWS).
3. Prohibit encroachments in the floodway from causing any increase in the base flood.	This is often confused with Section 431.f which credits preserving floodplain storage capacity (PSC), but it is a minimum NFIP requirement.
4. Apply for a conditional FIRM revision if a development in the floodway will increase the base flood elevation.	N/A

NFIP Requirement	Related CRS Credit
(e) When FEMA provides a FIRM that shows the coastal high hazard area (V Zone), the community shall:	
1. Meet all the requirements of 60.3(c).1-14	N/A
2. Keep records of the lowest structural member of new buildings.	Activity 310 (Elevation Certificates) credits keeping the records on the FEMA elevation certificate.
3. Make sure all new buildings are landward of mean high tide.	N/A
4. In V Zones with base flood elevations, require all new buildings to be elevated on pilings and columns so (i) the lowest horizontal structural member is elevated above the base flood level and (ii) an engineer or architect certifies the foundation anchoring.	Section 431.a.6 provides freeboard credit for requiring buildings *outside* of V Zones to have the lowest horizontal member elevated above the base flood. Credit under Section 431.b for engineered foundations (FDN) is not available in V Zones because they are required there. Section 431.o (CAZ) credits extending the V Zone standards to coastal AE Zones.
5. Make sure that the areas below elevated buildings are open or enclosed with breakaway walls.	Section 431.h (ENL) credits prohibiting *all* enclosures of the lower area.
6. Prohibit fill for structural support in V Zones.	Section 431.f credits prohibition of fill in the floodplain (PSC). It is not available if the community only prohibits fill in V Zones.
7. Prohibit man-made alteration of sand dunes and mangrove stands in V Zones.	*CRS Credit for Protecting Coastal Dunes and Beaches* credits prohibiting alteration of dunes outside of V Zones and regulations that restrict traffic on dunes.
8. Require mobile homes outside of existing mobile home parks to meet the requirements of (e)2-7 and mobile homes in existing parks to meet the requirements of (c)12.	N/A

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 *CRS Credit for Management of Mudflow Hazards*.
60.5 Flood plain management criteria for flood-related erosion-prone areas.	See *CRS Credit for Management of Coastal Erosion Hazards*.
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
Subpart B - Requirements for State Flood Plain Management Regulations	N/A
Subpart C - Additional Considerations in Managing Flood-Prone, Mudslide (i.e., Mudflow)-Prone, and Flood-Related Erosion-Prone Areas	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 found in the separate special hazards publications 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).

Section 631.b: Regulating new developments downstream of dams to protect them from flooding from a dam break (DFR).

Appendix E
COMMUNITY RATING SYSTEM PUBLICATIONS

Except as noted, the following documents are available at no cost. The end of this appendix includes two order forms.

General References on the Community Rating System (CRS)

CRS Coordinator's Manual, 2002. 300+ pages. Includes the current *Schedule* and *Commentary*. The *CRS Coordinator's Manual* is the primary document used by communities for the Community Rating System. It includes detailed discussion of credits provided for various floodplain management activities and instructions on the calculation of credit. The *CRS Coordinator's Manual* is used to verify CRS credit and for modifications of a community's CRS credit for a better classification.

CRS Activity Worksheets, 2002, 55 pages. The worksheets are used to calculate the verified activity scores and to submit modifications.

CRS Application, 2002, 50 pages. Instructions and worksheets for a community to apply for an initial CRS classification. The activities are summarized and the activity descriptions are combined with checklists which are submitted for application.

The National Flood Insurance Program's Community Rating System. These are several color brochures that summarize the CRS for distribution to elected officials, residents, and others who want an overview of the program.

"Computerized Calculations for the Community Rating System," 2002. A stand-alone program for IBM-compatible personal computers (on a compact disk) that guides data entry and calculates credit points. A copy of the user's guide is included. This software prints worksheets that may be used for submitting modifications as an alternative to the paper Activity Worksheets.

CRS Record-Keeping Guidance, 2002. Guidance on keeping track of records and annual actions such as outreach projects for CRS credit. The guide includes sample forms.

References on Specific Activities

"Computerized Format for FEMA Elevation Certificates," 2000. A program for entering and retrieving data from FEMA elevation certificates. Meets the requirements for credit for elevation certificates in computerized format under Activity 310 of the CRS. Requires an IBM-compatible PC and a compact disk drive.

CRS Credit for Drainage System Maintenance, 2002. 58 pages. A discussion of the credit under Activity 540 (Drainage System Maintenance) in the *CRS Coordinator's Manual*, with examples.

CRS Credit for Flood Warning Programs, 2002. 55 pages. A discussion of the credit under Activity 610 (Flood Warning Program) in the *CRS Coordinator's Manual*, with examples.

CRS Credit for Outreach Projects, 2002. 105 pages. A discussion of the credit under Activity 330 (Outreach Projects) in the *CRS Coordinator's Manual*, with examples.

CRS Credit for Higher Regulatory Standards, 2002. 73 pages. A discussion of the credit under Activity 430 (Higher Regulatory Standards) in the *CRS Coordinator's Manual*, with examples.

CRS Credit for Stormwater Management, 2002. 70 pages. A discussion of the credit under Activity 450 (Stormwater Management) in the *CRS Coordinator's Manual*, with examples.

Example Plans, 2002. 60 pages. A discussion of credit for Floodplain Management Planning (Section 510 in the *CRS Coordinator's Manual*), with examples.

References on Special Flood-Related Hazards

The following references cover the special flood-related hazards. They must be used by communities wishing to apply for CRS credit for management of the eight special hazard areas. They include worksheets needed for special hazards credit.

CRS Credit for Management of Areas Subject to Uncertain Flow Path Hazards

CRS Credit for Management of Areas Adjacent to Closed Basin Lake Hazards

CRS Credit for Management of Ice Jam Hazards

CRS Credit for Management of Floodprone Areas Subject to Land Subsidence Hazards

CRS Credit for Protecting Coastal Dunes and Beaches

CRS Credit for Management of Mudflow Hazards

CRS Credit for Management of Coastal Erosion Hazards

CRS Credit for Management of Tsunami Hazards

Community Rating System Publications

The following publications can be obtained free by folding and mailing this form (to the address on the back) or faxing it to 317-848-3578. If you want more than one copy, call (317) 848-2898. All of the "General and Application" and "Specific Activities" publications are available for downloading from FEMA's website, http://www.fema.gov, or on an IBM-compatible compact disk.

_____ Check here if you would prefer a paper copy of individual documents instead of the CD.

General and Application

_____ *CRS Coordinator's Manual*
_____ *CRS Activity Worksheets*
_____ *CRS Application*
_____ *The National Flood Insurance Program's Community Rating System* (color brochures)
_____ *CRS Record Keeping Guidance*

Specific Activities

_____ *CRS Credit for Drainage System Maintenance*
_____ *CRS Credit for Flood Warning Programs*
_____ *CRS Credit for Outreach Projects*
_____ *CRS Credit for Higher Regulatory Standards*
_____ *CRS Credit for Stormwater Management*
_____ *Example Plans*

Software

____ "Computerized Calculations for the Community Rating System" (IBM-compatible compact disk)
____ "Computerized Format for FEMA Elevation Certificates" (IBM-compatible compact disk)

Special Hazards

_____ *CRS Credit for Management of Areas Subject to Uncertain Flow Path Hazards*
_____ *CRS Credit for Management of Areas Adjacent to Closed Basin Lake Hazards*
_____ *CRS Credit for Management of Ice Jam Hazards*
_____ *CRS Credit for Management of Floodprone Areas Subject to Land Subsidence Hazards*
_____ *CRS Credit for Protecting Coastal Dunes and Beaches*
_____ *CRS Credit for Management of Mudflow Hazards*
_____ *CRS Credit for Management of Coastal Erosion Hazards*
_____ *CRS Credit for Management of Tsunami Hazards*

Please send these publications to (please specify a street address, not a post office box):

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Community Name: _____

Stamp

Flood Publications
NFIP/CRS
P.O. Box 501016
Indianapolis, IN 46250-1016

[Fold, staple or tape, and mail]

Federal Emergency Management Agency

Community Rating System Publications

The following publications are available free by faxing this form to (301) 362-5335. If you want more than one copy, call 1-800-480-2520. Each publication was written for a target audience:

GP - general public E - engineers and architects O - planners and permit officials

Libraries are encouraged to order only those publications noted with a "GP." Items noted with an asterisk can also be found on FEMA's website: www.FEMA.gov

Documents on flood maps and studies

____ GP *How to Use a Flood Map to Protect Your Property*, FEMA-258, May 1995.
____ E, O **Managing Floodplain Development in Approximate Zone A Areas*, FEMA-265, July 1995.
____ E *Flood Insurance Study Guidelines and Specifications for Study Contractors*, FEMA-37, 1999.

Documents on flood insurance

____ *GP* **Answers to Questions about the National Flood Insurance Program*, FEMA-387, 2001.
____ GP **Mandatory Purchase of Flood Insurance Guidelines*, FEMA-186, September 1999.

Documents on protecting a building

____ GP **Repairing Your Flooded Home*, FEMA-234,1992.
____ GP **Homeowner's Guide to Retrofitting*, FEMA-312,1998.
____ GP * *Above the Flood: Elevating Your Floodprone House*, FEMA-347, 2000.
____ GP *Elevated Residential Structures*, FEMA-54, March 1984.
____ GP *Coastal Construction Manual*, FEMA-55, June 2000.
____ GP *Manufactured Home Installation in Flood Hazard Areas*, FEMA-85, September 1985.
____ GP *Floodproofing Nonresidential Structures*, FEMA-102, May 1986.
____ GP *Design Manual for Retrofitting Flood-prone Residential Structures*, FEMA-114, 1986.
____ E, O **Protecting Building Utilities from Flood Damage*, FEMA-102, May 1986.
____ E *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings*, 1995.
____ O **Answers to Questions about Substantially Damaged Buildings*, FEMA-213, May, 1991
____ GP *Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas*, FEMA-257, October 1994.

Documents on community floodplain management or flood hazard mitigation

____ GP *A Unified National Program for Floodplain Management*, FEMA-248, May 1994.
____ GP *Design Guidelines for Flood Damage Reduction*, FEMA-15, December 1981.
____ O *Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials*, FEMA-116, February 1987.
____ GP, O * *Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability*, FEMA-364, 2000.
____ O * *Rebuilding for a More Sustainable Future: An Operational Framework*, FEMA-365, 2000.

Documents on natural and beneficial floodplain functions

____ GP, O *Protecting Floodplain Resources, A Guidebook for Communities*, FEMA-268, 1995

Please send these publications to (please specify a street address, not a post office box):

Name:_____

Address: _____

_____

City: _____ State: _____ Zip: _____

Community Name: _____NFIP Number: _____
(if applicable) (if applicable)

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Appendix F
COMMUNITY RATING SYSTEM ASSISTANCE AGENCIES

These agencies can help communities prepare programs that qualify for credit under the 18 CRS activities. More information about these agencies is provided on the following pages.

Federal Agencies	Pg.	310	320	330	340	350	360	410	420	430	440	450	510	520	530	540	610	620	630
FEMA Regional Office	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Emergency Management Institute	3	x	x				x	x		x					x				
Natural Resources Conservation Service	3		x			x	x	x	x		x	x	x	x	x	x	x	x	
US Geological Survey	4						x	x			x						x		
National Park Service	5								x				x						
Fish and Wildlife Service	6								x	x									
National Weather Service	7																x		
Coastal Resources Management	8			x					x	x		x							
US Army Corps of Engineers	8	x		x		x	x	x		x	x	x	x	x	x	x	x	x	x
Environmental Protection Agency	**10**											x	x						
State Agencies																			
State NFIP Coordinator	10	x	x	x	x	x	x	x		x			x		x				
Housing/econ./ community development	10									x			x	x	x				
Dam safety program	10																x		x
Emergency mgmt. agency	11			x									x				x	x	x
Department of transportation	11							x				x				x			
Environmental protection agency	10					x				x			x		x				
Parks/natural resources department	12					x			x	x									
State licensing board	12		x		x														
Regional Agencies	13			x		x		x	x	x	x	x	x	x	x	x			

Community Rating System Assistance Agencies

Federal Emergency Management Agency (FEMA) Regional Office - Mitigation Division [http://www.fema.gov]

Each of the ten FEMA Regional Offices has a Mitigation Division that handles the administration of the National Flood Insurance Program (NFIP), the Community Rating System (CRS), and several mitigation funding programs. These offices help states, communities and private entities interpret the federal regulations.

Program: NFIP and CRS Assistance

Program Description: Regional staff includes engineers and planners assigned to help communities. They provide technical assistance and publications to help citizens and local officials understand NFIP flood maps and the regulatory requirements for communities to participate in the NFIP. While each office has one person designated as the lead person for the CRS, a local official's first point of contact should be the planner or emergency management specialist assigned to that community.

Activities Supported: All

Point of Contact: FEMA Regional Office (see Appendix A in the *CRS Coordinator's Manual*).

Program: Hazard Mitigation Grant Program

Program Description: The Hazard Mitigation Grant Program will pay for 75% of the eligible costs of such mitigation projects. To be eligible, the projects should be consistent with the recommendations of the state's mitigation plans and strategies. Projects must be shown to be cost-effective, and they may mitigate hazards other than the one that caused the disaster.

Activities Supported: 520, 530

Point of Contact: FEMA Regional Office (see Appendix A in the *CRS Coordinator's Manual*).

Program: Flood Mitigation Assistance (FMA)

Program Description: To assist states and local governments to implement cost-effective measures that will reduce future flood damage and reduce future flood insurance claims. Examples of eligible projects include acquisition or elevation of National Flood Insurance Program-insured buildings, and minor drainage improvement projects. Also hazard mitigation plans can be generated with these funds.

Activities Supported: 510, 520, 530, 540

Point of Contact: FEMA Regional Office (see Appendix A in the *CRS Coordinator's Manual*).

Federal Emergency Management Agency
Emergency Management Institute

Program Description: FEMA's National Emergency Training Center in Emmitsburg, MD, is the home of the Emergency Management Institute (EMI) and the National Fire Academy. There, emergency managers, firefighters, and elected officials can take classes in many areas of emergency management, including emergency planning, exercise design and evaluation disaster management, hazardous materials response, and fire service management. EMI course are also given by many states. An Independent Study Program is also available to private citizens. Special seminars and workshops are offered via satellite as part of FEMA's *Emergency Education Network*, called EENET.

Courses of special interest to engineers, architects and building code officials are:

Retrofitting Floodprone Residential Buildings
Multihazard Building Design Summer Institute
Digital Hazard Data Course
Managing Floodplain Development Through the National Flood Insurance Program
National Flood Insurance Program - Community Rating System

Activities Supported: 310, 320, 360, 410, 430, 440, 530

Point of Contact: Your local emergency manager or the training officer in your state emergency management agency.

Department of Agriculture
Natural Resources Conservation Service (NRCS)

NRCS primarily serves rural areas. NRCS staff provides information on land use planning, conservation planning, resource development, water management and flood prevention to farmers, community officials, and land developers. While mostly a general information and technical assistance operation, NRCS also funds flood protection projects.

In addition, NRCS can assist local officials with review of subdivision proposals, erosion and sedimentation control, and other development plans.

Program: Cooperative River Basin Program, Section 6, Public Law 83-566

Program Description: Cooperative River Basin studies are for appraising water and related land resources and formulating alternative plans for conservation use and development. Generally, studies are of limited scope and short duration to provide specific information needed for planning. Plans may include management and land measures or combinations thereof that would meet existing and projected needs and objectives.

Task Assistance: 320, 350, 360, 410, 420, 440, 450, 510, 520, 530, 540, 610, 620

Point of Contact: The NRCS work is conducted through local soil and water conservation districts. The point of contact is the district conservationist who usually has an office in the county seat. (Check the local telephone directory).

Department of the Interior
U.S. Geological Survey (USGS) [http://www.usgs.gov]

The USGS performs surveys, investigations and research, covering topography, geology, hydrology, and the mineral resources of the United States. They classify lands as to their mineral water resources and publish and disseminate data relative to the foregoing activities. The USGS also publishes flow rates, and peak flows of certain streams and rivers.

Program: National Water Data Exchange

Program Description: Each state has a User Assistance Center. These centers can provide

- Factual information on flood peaks and discharges, flood depths and velocities, profiles of the water surface and areas inundated during major floods, time-of-travel of flood wave, and sediment transport information;
- Interpretative information regarding flood frequency relations, estimates of 10-, 50-, 100-, and 500-year flood discharges, computed water surface profiles, and flood-prone areas delineated on topographic maps;
- Assistance in minimizing flood losses by quickly identifying areas of potential flood hazards; and
- Additional information on the hydrology of floodplains.

Activities Supported: 360, 410, 440, 610

Point of Contact: Each state has a USGS Office. Either check the government section in the phone book or contact the State NFIP Coordinator.

Department of the Interior
National Park Service [http://www.nps.gov]

The objectives of the National Park Service are to administer the properties under its jurisdiction, to protect the natural environment of the areas, and to assist States, local governments, and citizen groups in the development of park areas, the protection of the natural environment, and the preservation of historic properties.

Program: Rivers, Trails and Conservation Assistance Program

Program Description: The Rivers, Trails and Conservation Assistance Program provides National Park Service staff for assistance to communities for river and trail corridor planning and open space preservation efforts. Program personnel are acknowledged experts in facilitating cooperative planning efforts. Projects are all based on substantial involvement of varied community interests. Targeted National Park Service assistance with grassroots planning can help communities make informed choices based upon consensus about future growth and development that will help avoid future flood losses.

Activities Supported: 420, 510

Point of Contact:

Alaska	(907) 257-2650
Northeast (Delaware, Maryland, Pennsylvania, Virginia, West Virginia)	(215) 597-7995
Midwest (Arkansas, Iowa, Kansas, Missouri, Nebraska, North Dakota, South Dakota)	(402) 221-3350
Illinois, Minnesota, Wisconsin	(414) 297-3617
Indiana, Michigan, Ohio	(216) 657-2950
North Atlantic (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont)	(617) 223-5203
Pacific Northwest (Idaho, Oregon, Washington)	(206) 220-4113
Rocky Mountain (Colorado, Montana, Utah, Wyoming)	(303) 969-2850
Southeast (Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Virgin Islands)	(404) 562-3175
Southwest (Arizona, New Mexico, Oklahoma, Texas)	(505) 988-6762
Western (California, Hawaii, Nevada)	(415) 427-1446

Department of the Interior
Fish and Wildlife Service [http://www.fws.gov]

The mission of the U.S. Fish and Wildlife Service is to work with others, to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Their major responsibilities are: migratory birds, endangered species, freshwater and anadromous fish, the National Wildlife Refuge System, wetlands, conserving habitat, and environmental contaminants.

The Fish and Wildlife Service provides expertise on questions relating to fish, wildlife, and habitat resource, preservation and maintenance. They also review wetland projects as part of the U.S. Army Corps of Engineers' 404 permit program.

Activities Supported: 420, 430

Point of Contact:

Region 1: Portland, Oregon (503) 231-6118
(California, Hawaii, Idaho, Nevada, Oregon, Washington)

Region 2: Albuquerque, New Mexico (505) 248-6911
(Arizona, New Mexico, Oklahoma, Texas)

Region 3: Twin Cities, Minnesota (612) 713-5361
(Illinois, Iowa, Indiana, Michigan, Minnesota, Missouri, Ohio, Wisconsin)

Region 4: Atlanta, Georgia (404) 679-4000
(Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico)

Region 5: Newton Corner, Massachusetts (413) 253-8325
(Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia)

Region 6: Denver, Colorado (303) 236-7920
(Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming)

Region 7: Anchorage, Alaska (907) 786-3309
(Alaska)

National Oceanic and Atmospheric Administration
National Weather Service (NWS) [http://www.nws.noaa.gov]

Reports the weather of the U.S. and its possessions and provides weather forecasts to the general public, issues warnings against natural events, such as hurricanes, tornadoes, floods, and tsunamis, provides special services in support of aviation, marine activities, agriculture, forestry, urban air-quality control, and other weather-sensitive activities; monitors and reports all non federal weather modification activities conducted in the United States.

Program: Local Flood Warning Systems

Program Description: Floodplain information and interpretation assistance for specific points on larger rivers of the United States can be obtained from the National Weather Service. NWS provides flood forecasts and warnings on larger rivers and provides flash flood warnings on smaller streams. Interested communities are assisted in establishing flood warning systems. There are 12 field forecasting offices across the United States. Regional office staff can identify field stations near a user.

Also, storm surge frequency information and interpretative assistance are available for the Gulf of Mexico and Atlantic coasts. Studies have been completed for the Gulf of Mexico coast from the Alabama-Florida border to southern Florida and along the Atlantic coast from southern Florida to Cape Henlopen, the southern boundary of Delaware Bay. NWS also provides warnings of storm surges associated with tropical and extra-tropical storms.

Activities Supported: 610

Point of Contact: There are six Regional Offices:

Eastern: Bohemia, NY (516) 244-0100
(Connecticut, Delaware, District of Columbia, Rhode Island, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania)

Southern: Fort Worth, TX (817) 978-2561
(Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, New Mexico, Oklahoma, Puerto Rico, Tennessee, Texas)

Central: Kansas City, MO (816) 426-5400
(Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin, Wyoming)

Western: Salt Lake City, UT (801) 524-5122
(Arizona, California, Idaho, Montana, Nevada, Oregon, Utah, Washington)

Alaskan: Anchorage, AK (907) 271-5136
(Alaska)

Pacific: Honolulu, HI (808) 532-6416
(Hawaii, independent countries in free association with the U.S.)

National Oceanic and Atmospheric Administration
Office of Coastal Resources Management [http://www.ocrm.nos.noaa.gov/czm]

Program: Coastal Zone Management Program (Their website is being developed. Consult the state contact at the phone number listed blow for updated website information.)

Program Description: The national program, created by the Coastal Zone Management Act of 1972 (CZMA), balances competing demands on the coast. The program covers a range of issues, including habitat protection, coastal hazard mitigation, public access to the coast, nonpoint source pollution control, and responsible coastal development. The program is designed as a federal-state partnership in which coastal management is undertaken through the administration of state laws and regulations while the federal government provides funding, technical assistance, and support.

Objectives of the CZMA include:

- manage coastal development to protect life and property from coastal hazards;
- protect wetlands and other coastal ecosystems;
- provide public access to the nation's beaches and coastal areas;
- maintain and, where necessary, improve the quality of coastal waters;
- provide for the development of energy resources, such as oil and gas, in a manner compatible with the long-term conservation of resources; and
- coordinate and simplify administrative procedures to expedite government decisionmaking.

Activities Supported: 330, 420, 430, 450

Point of Contact: The following are the state coastal zone management contacts. Those marked with an asterisk do not yet have a federally approved coastal management program.

Alabama	(510) 286-4185
Alaska	(907) 465-3562
California	(415) 904-5200
Connecticut	(860) 424-3034
Delaware	(302) 739-4506
Florida	(850) 922-5438
Georgia*	(912) 264-7218
Guam	(671) 472-4201
Hawaii	(808) 587-2875
Illinois*	(312) 793-3123
Indiana*	(317) 233-0131
Louisiana	(225) 342-7591
Maine	(207) 287-3261
Maryland	(410) 974-2784
Massachusetts	(617) 727-9530 x 400
Michigan	(517) 373-1950
Minnesota*	(218) 327-4417
Mississippi	(228) 374-5000
New Hampshire	(603) 271-2155
New Jersey	(609) 292-2662
New York	(518) 474-3643
North Carolina	(919) 733-2293
No. Mariana Is.	(670) 234-6623
Ohio	(614) 265-6413
Oregon	(503) 731-4065
Pennsylvania	(717) 787-5259
Puerto Rico	(787) 724-2816
Rhode Island	(401) 277-2476
Samoa	(684) 633-5155
South Carolina	(803) 744-5838
Texas	(512) 463-5054
Virgin Islands	(340) 774-3320
Virginia	(804) 698-4320
Washington	(360) 407-6600
West Virginia	(304) 558-5380
Wisconsin	(608) 267-7982

Department of Defense
U.S. Army Corps of Engineers

The Civil Works Program is the Nation's major water resources development activity. It involves engineering works such as major dams, reservoirs, levees, harbors, waterways, locks, and many other types of structures. Planning assistance is provided to states and other nonfederal entities for the comprehensive management of water resources, including pollution abatement works.

This program conducts feasibility studies and builds flood damage reduction projects. Major projects require specific authorization and funding by Congress, while small projects can be implemented with agency authority.

Program: Floodplain Management Services Program

Program Description: Within the Civil Works Program is the Corps' Floodplain Management Services Program which provides flood hazard determinations, technical data on flood hazards, and guidance on flood proofing, floodplain regulations, flood warning, emergency preparedness, and evacuation planning.

Program: Section 206 of the 1960 Flood Control Act, as amended (Floodplain Management Services Program)

Program Description: Provides floodplain information and technical assistance to states, counties, and cities for prudent use of land subject to flooding from streams, lakes and oceans.

Examples of projects include developing and interpreting flood and flood plain data such as flood hazard mapping; providing a broad assessment of the impact of structural and nonstructural flood damage reduction measures; providing technical assistance on flood proofing systems and techniques; and assessing the possible impacts of land use changes on the physical, socio-economic and environmental conditions of the floodplain.

Activities Supported: 310, 330, 350, 360, 410, 430, 440, 450, 510, 520, 530, 540, 610, 620, 630

Point of Contact: There are eight Division Offices, and 38 District Offices. Check the local phone book, contact the State NFIP Coordinator, or contact the FEMA regional office for the appropriate Corps district office.

U.S. Environmental Protection Agency
Watershed Assistance Grants (www.rivernetwork.org)

Funding to provide support to grassroots organizations to develop watershed partnerships in part comes from the EPA. Eight Federal agencies are responsible for developing a Clean Water Action Plan. As a result of this plan, in 1998 the EPA selected the River Network to administer and coordinate the Watershed Assistance Grants. Agencies responsible for developing the Action Plan include Defense, Interior, Agriculture and others.

Program: Watershed Assistance Grants

Program Description: The purpose of the Watershed Assistance Grants program is to provide small grants to local watershed partnerships to support their organizational development and long term effectiveness. These grassroots citizens' organizations are dedicated to protecting and restoring the watershed in their area.

Interested persons should use the self-screening process which is available to assure that persons and organizations are eligible to receive a grant and that the activities being proposed meet the program criteria.

Activities Supported: 450, 510

Point of Contact: This is one of the Federal agencies coordinating development of the Clean Water Plan.

Interagency Coordinator
U.S. Army Corp of Engineers
CECW-PD
441 G Street N.W., 3G73
Washington, D.C. 20314-1000
(202) 761-4489
Fax: (202) 761-0140

State Agencies

State NFIP Coordinator

Most states have an NFIP Coordinator whose duties include advising and assisting local officials and property owners about the National Flood Insurance Program (NFIP), particularly its regulatory aspects. These offices are also the best sources of information about related floodplain management issues, including programs that affect or support flood reduction. A few state coordinating offices provide technical assistance or manage financial assistance programs. The State NFIP Coordinating Offices are listed in Appendix H.

Activities Supported: 310, 320, 330, 340, 350, 360, 410, 430, 510, 530

Housing/community affairs/economic development agency

Most states have a department of community affairs or similar office that is responsible for managing the Community Development Block Grant. Some states have their own funding programs that operate similar to the Block Grant. They fund housing or economic improvement projects, including projects that protect buildings from floods. Some agencies provide technical assistance to communities undertaking floodplain management planning or establishing programs to help property owners.

Activities Supported: 430, 510, 520, 530

Point of Contact: The title and duties will vary from state to state, but most will have a community affairs agency located in the state capital. Check with your state NFIP Coordinator.

Dam safety program

Most states have a dam safety program. It will vary from state to state as to what size of impoundments are regulated. The majority of states also provide for a system of inspections and checks for state regulated dams, to insure they are being properly maintained.

Activities Supported: 610, 630

Point of Contact: Check with your state NFIP Coordinator or contact the Association of State Dams Safety Officials at 450 Old Vine St., 2nd Floor, Lexington, KY 40507, (606) 257-5140.

Emergency management agency

This agency is the Governor's designated contact in the event of a disaster. It is the liaison between community officials and the federal government. This agency is responsible for publishing the state's emergency plans as required for presidentially declared disaster assistance. The state manages the FEMA mitigation programs introduced earlier.

Activities Supported: 330, 510, 610, 620, 630

Point of Contact: Check with your state NFIP Coordinator.

Department of transportation

An office in the highway agency is responsible for the design, engineering and developing of roads and bridges. As part of their duties they make sure the following regulations are complied with:

- Federal Highway Administration's *Federal-Aid Policy Guide*;
- The Federal Emergency Management Agency regulations;
- The Environmental Protection Agency's National Pollution Discharge Elimination System regulations;
- The state stormwater and sediment and erosion control regulations; and
- Departmental policy

The highway office may have a listing of all bridges, the elevations of the bridges, and the 100-year flood level for that bridge location. This information can be used to determine flood levels in areas with state highways.

Activities Supported: 410, 450, 540

Point of Contact: Check with your state NFIP Coordinator.

Environmental protection agency

Most state environmental protection agencies have a stormwater management program. This program monitors communities for compliance with state and federal stormwater run-off regulations . Some agencies manage erosion and sedimentation regulations as part of their non-point source pollution management programs.

Activities Supported: 350, 430, 450

Point of Contact: Check with your state NFIP Coordinator.

Parks/recreation/natural resources department

This department usually handles the rules and regulations governing the natural resources within the state. It usually controls large amounts of open space land, wetlands, and water impoundments. Department staff can help with issues related to natural and beneficial floodplain functions.

Activities Supported: 350, 420, 430

Point of Contact: Check with your state NFIP Coordinator.

State licensing board

Among other things, the state licensing board tests and issues licenses for lending institutions, insurance agents, and real estate agents. The agency may be a good contact with these organizations.

Activities Supported: 320, 340

Point of Contact: Check with your state NFIP Coordinator.

Regional Housing, Community Development, Planning, and Sewer Agencies

There are many different kinds of city, county, and regional agencies involved in housing, planning, urban renewal, and community development. Community development departments and housing authorities work to improve local housing conditions through public housing and other programs to help low and moderate income residents. This work can be in the form of building inspections, technical assistance, and financial assistance.

Other local and regional agencies include regional planning commissions and water management districts. Most provide general information to residents and technical assistance to local officials. Some can assist in mitigating flood conditions when done on a community-wide or neighborhood basis.

Some sanitary districts have floodplain or stormwater management regulatory authority based on the need to keep floodwaters out of sewer lines. Some of these agencies have active technical and financial assistance programs to help property owners flood proof or retrofit their homes.

Activities Supported: 330, 350, 410, 420, 430, 440, 450, 510, 520, 530, 540

Point of Contact: These agencies may be listed in the local telephone directory. State NFIP coordinators and FEMA Regional Offices may know of agencies particularly active in floodplain management.

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Appendix G
ISO/CRS SPECIALISTS

Alabama – David Van Troost
Alaska – Linda Ryan
Arizona - Ron Mielnicki
Arkansas - Bill Baker
California – Linda Ryan, Rob Flaner, Ron Mielnicki
Colorado (Denver metro) – Phil Anderson
Colorado (rest of state) – Bill Baker
Connecticut - Jimmy Chin
Delaware - Linda Clarity
Florida - Danny Hinson, Gabe Gambrill, David Clukie
Georgia - David Van Troost
Hawaii - Rob Flaner
Idaho - Rob Flaner
Illinois - Mike Knox
Indiana – Jack Clark
Iowa - Errol Garren
Kansas – Phil Anderson
Kentucky - Jack Clark
Louisiana - Phil Anderson
Maine - Jimmy Chin
Maryland - Linda Clarity
Massachusetts - Jimmy Chin
Michigan - Errol Garren
Minnesota - Errol Garren
Mississippi - David Van Troost
Missouri - Phil Anderson
Montana – Rob Flaner
Nebraska – Phil Anderson
Nevada - Ron Mielnicki
New Hampshire - Jimmy Chin
New Jersey - Linda Clarity
New Mexico – Ron Mielnicki
New York (Long Island) - Linda Clarity
New York (Upstate) – Tom Brett
North Carolina - Gil Dunn
North Dakota - Errol Garren
Ohio – Tom Brett
Oklahoma - Bill Baker
Oregon – Linda Ryan
Pennsylvania - Tom Brett
Rhode Island - Jimmy Chin
South Carolina - David Van Troost
South Dakota - Errol Garren
Tennessee - Jack Clark
Texas - Bill Baker
Utah – Rob Flaner
Vermont - Jimmy Chin
Virginia - Tom Brett
Washington - Rob Flaner
West Virginia - Tom Brett
Wisconsin – Mike Knox
Wyoming – Errol Garren

Telephone numbers are for both voice and fax.

Phil Anderson
1713 Lakeshore Dr.
Owensville, MO 65066
573/437-3338
panderson@iso.com

Bill Baker
3013 Twilight Cove
Bryant, AR 72022
501/847-2280
wbaker@iso.com

Tom Brett
1327 Old Meadow Road
Pittsburgh, PA 15241
412/221-4679
tbrett@iso.com

Jimmy Chin
6 Stedman Street - #1
Brookline, MA 02446
617/734-9424
jchin@iso.com

Linda Clarity
1116 Bernard Court
Brick, NJ 08724
732/840-5296
lclarity@iso.com

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jwclark@iso.com

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gdunn@iso.com

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90 South Blackwood Ave.
Eagle, ID 83616
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rflaner@iso.com

Gabe Gambrill
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Ponte Vedra Beach, FL 32082
904/280-1268
hgambrill@iso.com

Errol Garren
1948 NW 88th Court
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515/278-8186
egarren@iso.com

Danny Hinson
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Orange Park, FL 32073
904/264-8646
jhinson@iso.com

Mike Knox
189 Little John Lane
Springfield, IL 62704
217/787-0584
mknox@iso.com

Ron Mielnicki
P.O. Box 2819
2375 W. Willow Breeze
Chino Valley, AZ 86323
928/636-5969
rmielnicki@iso.com

Linda Ryan
270 Bluebird Lane
Tillamook, OR 97141
503/842-0029
lryan@iso.com

David Van Troost
4250 Poplar Springs Rd.
Gainesville, GA 30507
770/536-3039
dvantroost@iso.com

Appendix H
STATE NFIP COORDINATORS

Most states have an NFIP Coordinator whose duties include advising and assisting local officials and property owners about the National Flood Insurance Program (NFIP), particularly its regulatory aspects. These offices are also the best sources of information about related floodplain management issues, including programs that affect or support flood reduction. A few state coordinating offices provide technical assistance or manage financial assistance programs. The State NFIP Coordinating Offices are listed below.

Charles Sanders
Alabama Dept. of Economic & Comm. Affairs
Office of Water Resources
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Appendix I
APPLICATION PROCEDURES

The procedures for applying for the CRS are covered in the *CRS Application*. The information in this appendix is taken directly from that publication.

210 REQUESTING CRS CREDIT

The prerequisites for applying for a CRS classification are covered in Section 211 of this *CRS Application* and the more detailed *CRS Coordinator's Manual*. Application documents and procedures are explained in Sections 212 and 213. If you do apply, you are required to submit all of the application documents needed, including application for credit under Activity 310 (Elevation Certificates). Repetitive loss communities are also required to submit additional materials as explained on pages 33–34.

211 Credit Prerequisites

a. Application Prerequisites: There are two prerequisites to applying to become a Class 9 or better community. First, the community must have been in the Regular Phase of the National Flood Insurance Program (NFIP) for at least one year. Second, the community must be in full compliance with the minimum requirements of the NFIP. If a CRS community is determined at any time not to be in full compliance, it will revert to a CRS Class 10.

Your application must include a letter from the FEMA Regional Office stating that your community is in full compliance with the NFIP. (The Regional Offices are listed on page 45.) The letter must have been written no earlier than six months before your application is submitted. The Regional Office or State NFIP Coordinator may need to visit your community if they have not been there recently. If so, your application cannot be processed until the visit is conducted and FEMA confirms your community's full compliance.

b. Class 7 Prerequisite: To be a Class 7 or better, a community must have received a classification of 6 or better under the Building Code Effectiveness Grading Schedule (BCEGS). Both BCEGS classifications (residential/personal and commercial) must be a Class 6 or better.

The BCEGS is administered by the Insurance Services Office, Inc. (ISO). It measures a community's building code standards as they relate to natural hazard mitigation and how the community administers its code. More information about BCEGS can be obtained from your ISO/CRS Specialist (see page 53).

There are additional prerequisites for a community to become a Class 4 or better.

c. Application Information: You MUST check with your FEMA Regional Office (listed on page 45) to determine if your community is in full compliance with the NFIP. If so, ask for a letter of confirmation. You cannot apply for a CRS classification until the FEMA Regional Office provides the letter. You may have to wait for the Region or the State Coordinator to conduct a community visit.

Call your ISO/CRS Specialist (see page 53) and discuss your application. The ISO/CRS Specialist can provide advice on helpful hints, common mistakes to avoid, how neighboring communities have

handled certain activities, and possible timing of the verification visit. Ask your ISO/CRS Specialist for the following information:

1. What is your community's BCEGS classification? Enter the two numbers (residential/ commercial) in the blanks in the top line of the application cover page on page 7.
2. What parts of the application are submitted to the Regional Office and the State NFIP Coordinator? Some FEMA Regions and State Coordinators will want the entire application and some will want to review only certain parts. In any case, the entire application is submitted to the ISO/CRS Specialist. See also "Application Submittal" on page 9.
3. Is your community a repetitive loss community? If so, ask for the FEMA repetitive loss list so that you can meet the requirements of Sections 501–503 on pages 33–34.
4. How many credit points will you receive for your state's dam safety program under Activity 630 (Dam Safety)? Enter this in the blank before Section 631.a on page 44.
5. What is your community's growth adjustment factor? Enter this number in the blank before 711.a on page 44.
6. How many NFIP policies are in your community, how much flood insurance coverage is provided, and what are the annual premiums paid? This information is not required, but it will help determine the monetary impact of your participation in the CRS.

212 Application Documents

A complete application must include the appropriate worksheet pages from this *CRS Application* and the documents that must be submitted with them as noted in the Application Documentation section for each activity. Your application will not receive full credit, and may be rejected, if the documentation is not complete.

Application Cover Page: On page 7 is the application cover page that includes data needed about your community. It should be the first page of your application. The following notes explain Sections 1 through 8 on the cover page. All of these items must be included with your application package.

1. Your NFIP number and "FIRM Effective Date" are found on the legend of your FIRM. The latter is usually the date of conversion to the Regular Program of the NFIP. The "Current FIRM Date" is the date on the FIRM Index Map (or the FIRM legend if only one panel was printed).

2. Your Chief Executive Officer (CEO) is your mayor, county board chair, city manager, or other person of equivalent position. Your CEO must designate your community's CRS Coordinator.

The CRS Coordinator

The CRS Coordinator coordinates the application work of the various local departments and offices performing the activities for which credit is being requested. This person serves as the liaison between the community and FEMA and the ISO/CRS Specialist on CRS matters.

The CRS Coordinator need not be the person who normally handles NFIP activities. The program will be best managed when the CRS Coordinator can speak for the CEO, e.g., an assistant city manager. The CRS Coordinator should attend all CRS workshops. This person should know the operations of all community departments that deal with floodplain management and public information. The CRS Coordinator must coordinate the application process and know where to obtain the documentation needed for each activity.

OMB NO. 3067-0195
Expires February 28, 2005

210 CRS APPLICATION COVER PAGE

1. Community Name: _____State: ____ BCEGS: _____/_____

   NFIP Number: _____ FIRM Effective Date: _____, _____

   Population: _____ Current FIRM Date: _____, _____

   Application Date: _____, 200____ County: _____

2. | | Chief Executive Officer | CRS Coordinator |
   |---|---|---|
   | Name: | _____ | _____ |
   | Title: | _____ | _____ |
   | Address: | _____ | _____ |
   | | _____ | _____ |

   Coordinator's Telephone: _____ Fax: _____

   Coordinator's email: _____

3. Attached is our letter from FEMA stating that we are in full compliance with the minimum requirements of the National Flood Insurance Program.

4. I hereby certify that _____ [community name] is implementing the following activities (check the ones that apply). We will continue to implement these activities and will advise the Federal Emergency Management Agency 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
   ____ 320 Map Information
   ____ 330 Outreach Projects
   ____ 340 Hazard Disclosure
   ____ 350 Flood Protection Information
   ____ 360 Flood Protection Assistance
   ____ 410 Additional Flood Data
   ____ 420 Open Space Preservation
   ____ 430 Higher Regulatory Standards
   ____ 430LD Land Development Criteria
   ____ 440 Flood Data Maintenance
   ____ 450 Stormwater Management
   ___✓ Repetitive Loss Requirements
   ____ 510 Floodplain Management Planning
   ____ 520 Acquisition and Relocation
   ____ 530 Flood Protection
   ____ 540 Drainage System Maintenance
   ____ 610 Flood Warning Program
   ____ 620 Levee Safety
   ____ 630 Dam Safety

5. Attached are the worksheet pages and the documentation for the checked activities as well as the page for Section 720, showing that we have at least 500 points for CRS credit.

6. 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.

7. Signed: _____ (Chief Executive Officer)

3. Your application must include the letter from the FEMA Regional Office stating that your community is in full compliance with the NFIP. The letter must be dated no more than six months before your application date.

4. Check each activity for which you are applying. One space is already checked because Activity 310 (Elevation Certificates) is a minimum requirement for participation in the CRS. You must complete and submit the worksheet page for Activity 310 (page 10).

   As noted on page 5, you must check to see if you are a repetitive loss community. Read and complete page 33 on Repetitive Loss Requirements. If you have one or more repetitive loss properties, you must obtain the list of properties from FEMA and complete the two worksheet pages for Sections 501–503 on pages 33–34. Category C communities (those with more than 10 repetitive loss properties) must also apply for Activity 510 (Floodplain Management Planning).

   Your CEO's signature certifies that your community is actually implementing the activities in your application. This certification does NOT mean that you will START doing them; it means that your community IS doing them as of the date of your application.

> This *CRS Application* contains examples of certifications and ordinance language. It is recommended that all certifications and proposed ordinances be reviewed by your attorney or corporation counsel.

5. Your application must include completed copies of the appropriate worksheet pages of this *CRS Application* and the documentation that is required for each activity. See "Worksheet Pages" on page 9. The worksheet page for 720 (Community Total Points) is also required to show your total points. You may apply for any of the other activities, as long as all of your activities add up to 500 points or more.

6. The National Flood Insurance Act, as amended in 1973, requires "the purchase of flood insurance by property owners who are being assisted by federal programs or by federally supervised, regulated or insured agencies or institutions in the acquisition or improvement of land or facilities located or to be located in identified areas having special flood hazards." This requirement is also explained on page 14.

   As a property owner, a local government is subject to this law as well. If your community received federal financial assistance for a community-owned building in the floodplain, you are required to maintain flood insurance on that building. Examples of federal financial assistance you may have received include Environmental Protection Agency grants to improve wastewater treatment plants, Community Development Block Grants, and FEMA disaster assistance for damaged buildings.

   Your CEO must certify that you have all the flood insurance policies that you have been required to have. The CRS is not concerned with past lapses in flood insurance coverage. What counts is that NFIP insurance is in effect when you apply and is kept in the future. The CRS Coordinator should make every effort to determine the community's legal requirement to purchase flood insurance.

7. The cover page must be signed by your community's CEO. This form cannot be signed by a department head or other staff person.

213 Application Procedures

a. Application Submittal: Ask your ISO/CRS Specialist about who gets what parts of the application. A complete application (appropriate worksheet pages and all needed documentation) is sent to your ISO/CRS Specialist.

Worksheet Pages: Each activity has one or more pages that explains the credit points and/or a worksheet page. Worksheet pages are the pages in this *CRS Application* with the space at the top for the community's name. Enter the appropriate credit points in the blanks in the left column of the worksheet page. The credit points are added and the total points for each activity are transferred to page 44.

Documentation: The last section of each activity is the Application Documentation section. You must check off the documentation that is needed with the application and you must check that those items needed for verification will be provided during the verification visit. Attach the documentation that is submitted with the application to the worksheet page for that activity. Mark the margins of the documents to show where the credited element is covered (see example on pages 19-20). Your ISO/CRS Specialist will explain any additional documentation that may be needed for the verification visit or your annual recertification.

Submittal: All or parts of the application are sent to the FEMA Regional Office, Attn: Director, Federal Insurance and Mitigation Division, and to your State NFIP Coordinator. The FEMA Regional Offices are listed in Appendix A, page 45. They or the ISO/CRS Specialist can provide the name, address, and telephone number of your State NFIP Coordinator.

A complete application includes the following:

- A completed *CRS Application* Cover Page (page 7), signed by the CEO
- Completed worksheet pages (those pages with "Community: _____" at the top)
- All needed documentation, as noted at the end of each worksheet page.

Your application will not be processed under the following circumstances:

- If your community is not in full compliance with the NFIP,
- If your application is incomplete, or
- If your application does not have the 500 points needed to warrant a Class 9.

b. Application Review: The ISO/CRS Specialist and FEMA Regional Office will need approximately one month to conduct the application review. Once the application review confirms that your community should have the 500 points needed for a Class 9, the ISO/CRS Specialist schedules a verification visit. This visit is usually held within six months of receipt of a complete application.

During the verification visit, the ISO/CRS Specialist will review your activities according to the scoring criteria in the *CRS Coordinator's Manual*. For example, a random sample of your elevation certificates will be checked to see if they are complete and correct. Your credit points could increase or decrease based on these reviews and the more accurate scoring formulae in the *Coordinator's Manual*.

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ACTIVITY WORKSHEETS

The Activity Worksheets are no longer published as part of the *CRS Coordinator's Manual*. They can be ordered separately in paper or digital format (see Appendix E).

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