IOWA DEPARTMENT OF NATURAL RESOURCES

LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES



# FLOODPLAIN MANAGEMENT READY REFERENCE

# INTRODUCTION

## NOTES TO THE USER

This condensed ***Ready Reference*** is a companion to the comprehensive ***Floodplain Management Desk Reference***, which provides the information and lists of additional resources that can be used to effectively administer a local floodplain management program at the community level. Both publications are available free from the Iowa Department of Natural Resources.

The responsibility for reducing flood losses is shared by all levels of government (local, state, and federal) and the private sector. Successfully fulfilling this responsibility depends on having the knowledge and skills to plan and implement needed floodplain management measures. While any interested party may use these reference manuals, both are written specifically for the local official responsible for administering community floodplain management programs and regulations.

## COMMONLY USED ACRONYMS

The acronyms below are frequently used throughout the ***Ready Reference*** and the ***Floodplain Management Desk Reference***.

| | |
|---|---|
| **AMP:** | Automated Map Production |
| **BFE:** | Base Flood Elevation |
| **CFR:** | Code of Federal Regulations |
| **CID:** | Community Identification Number |
| **CLOMA:** | Conditional Letter of Map Amendment |
| **CLOMR:** | Conditional Letter of Map Revision |
| **CLOMR-F:** | Conditional Letter of Map Revision Based on Fill |
| **CRS:** | Community Rating System |
| **CWID:** | County-Wide Identification Number |
| **DNR:** | Department of Natural Resources |
| **DOT:** | Department of Transportation |
| **EO:** | Executive Order |
| **FDT:** | Floodway Data Table |
| **FEMA:** | Federal Emergency Management Agency |
| **FHBM:** | Flood Hazard Boundary Map |
| **FIRM:** | Flood Insurance Rate Map |
| **FIS:** | Flood Insurance Study |
| **FMIX:** | FEMA Mapping and Insurance Exchange |
| **FPE:** | Flood Protection Elevation |
| **ICC:** | Increased Cost of Compliance |
| **HVAC:** | Heating, Ventilation, and Air Conditioning |
| **LIDAR:** | Light Detection and Ranging |
| **LOMA:** | Letter of Map Amendment |
| **LOMC:** | Letter of Map Change |
| **LOMR:** | Letter of Map Revision |
| **LOMR-F:** | Letter of Map Revision Based on Fill |
| **NFHL:** | National Flood Hazard Layer |
| **NFIP:** | National Flood Insurance Program |
| **NGS:** | National Geodetic Survey |
| **NTU:** | Notice to User |
| **MSC:** | Map Service Center |
| **RR 2.0:** | Risk Rating 2.0 |
| **SDE:** | Substantial Damage Estimator |
| **SFHA:** | Special Flood Hazard Area |
| **SFIP:** | Standard Flood Insurance Policy |
| **USACE:** | United States Army Corps of Engineers |
| **USGS:** | United States Geological Survey |

## READY REFERENCE ORGANIZATION

The section numbering is the same in both the Ready Reference and Floodplain Management Desk Reference documents. For more information on topics discussed in the Ready Reference, refer to the first page of that same section in the companion Floodplain Management Desk Reference. This first page serves as the Table of Contents specific to that section.

**Background Information**

1. Flooding and Floodplain Dynamics
2. The National Flood Insurance Program

**Flood Maps and Data**

3. How Flood Maps are Prepared
4. NFIP Maps
5. Using Maps and Data
6. Maintaining and Revising NFIP Maps

**Regulatory Standards**

7. Regulatory Framework
8. Regulatory Requirements: Maps and Data
9. Regulatory Requirements: What Requires a Permit?

# INTRODUCTION (cont'd)

10. Regulatory Requirements: Floodways
11. Regulatory Requirements: New Buildings
12. Regulatory Requirements: Existing Buildings – Improvements and Repairs
13. Additional Regulatory Standards

**Administration**

14. Permit Review
15. Inspections
16. Appeals and Variances
17. Enforcement
18. Records

**Flood Insurance**

19. Flood Insurance
20. The Community Rating System

**Planning and Mitigation**

21. Disaster Operations

**Resources**
Contacts and Resources

## BASIC RULES

There are five basic rules to follow when administering a floodplain management program. They are detailed in this ***Ready Reference.***

**Rule #1: You must use the effective maps and flood data published by the Federal Emergency Management Agency (FEMA).**
*Section 8 reviews the requirements on using maps and data and ordinance administration.*

**Rule #2: A permit is required for all development in the Special Flood Hazard Area (SFHA) as shown on your community's Flood Insurance Rate Map (FIRM).**
*Sections 9 and 14 cover permit requirements.*

**Rule #3: Development must not increase the flood hazard on other properties.**
*Section 10 discusses the requirements for accessing the impacts of proposed development on other properties and the area designated as a regulatory floodway.*

**Rule #4: New buildings must be protected from damage caused by the base flood.**
*Section 11 discusses the regulatory requirements for new buildings.*

**Rule #5:** If the cost of improvements or the cost to repair the damage equals or exceeds 50 percent of the market value of an existing structure, it must be brought up to current floodplain management standards. This requirement also applies when the original floor area of a building is increased by 25 percent.
*Section 12 covers the rules for substantial damage and substantial improvement.*

## FOR MORE INFORMATION

***Iowa Department of Natural Resources***
Land Quality Bureau – Flood Plain Management & Dam Safety
Wallace State Office Building
502 E 9th St
Des Moines, IA 50319-0034
http://www.iowadnr.gov/InsideDNR/RegulatoryLand/FloodPlainManagement

***Additional Sources***
Flood Plain Permits, Dam Safety, Floodplain Mapping and the NFIP
1-515-725-8415

Sovereign Land Program Coordinator
515-281-8967

Water Quality Certification
515-725-0341

Recreational Boat Docks
515-281-5918

Sand and Gravel Permits
515-281-8621

***Federal Emergency Management Agency***
Federal Emergency Management Agency, Region VII
11224 Holmes Road
Kansas City, MO 64131
816-283-7031

FEMA

# 1. Flooding and Floodplain Dynamics

Floods are part of the Earth's natural hydrologic cycle. Water is in a state of continuous movement between the sky, the surface of the Earth, bodies of water, under the ground, and inside plants and animals. Whenever the rate of precipitation is greater than the combination of evaporation and infiltration, water accumulates on the surface as runoff, and flooding can occur.

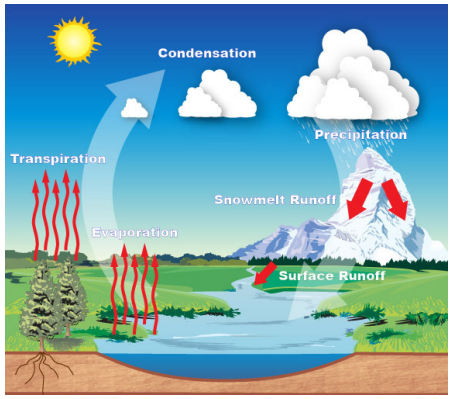


*Figure 1: The Hydrologic Cycle*

## WATERSHEDS AND FLOODPLAINS

Watershed: A land area that channels rainfall and snowmelt to creeks, streams, rivers, and eventually outflow points such as reservoirs, bays, and the ocean.
Floodplain: Any land area susceptible to being inundated by floodwaters from any source.

If a floodplain is undeveloped, it has two major effects on a flood: it stores more water temporarily while the channel is overflowing, and it allows additional infiltration of water during flood events. Both effects reduce the amount of water moving downstream, reducing peak flows and the maximum flood depths.

**Types of Flooding**

- Riverine (Fluvial) Flooding – overflows a river's banks
- Flash Flooding – occurs with little or no warning
- Rainfall (Pluvial) Flooding – driven by persistent, heavy rainfall

**Types of Flood Hazards**

- Sheet Flow – floodwater that spreads out over a large area with uniform depth
- Ponding – occurs when runoff collects in depressions and cannot drain out
- Levee and Dam Failures – overtopping or failure of water impoundment systems
- Ice Jams – an accumulation of ice that constricts a channel and raises water levels
- Debris Dams –debris that constricts a channel and raises water levels
- Closed Basin Lakes – no outlet, subject to large fluctuations in water level

## NATURAL AND BENEFICIAL FLOODPLAIN FUNCTIONS

**Water Resources**

- Floodwater storage and conveyance
- Reduced flood velocities and flood peaks
- Natural controls on flooding and erosion
- Water quality – filtering nutrients and impurities form runoff
- Groundwater recharge

**Biologic Resources**

- High rate of plant growth
- Biodiversity and ecosystem integrity
- Habitat protection

**Societal Resources**

- Wild and cultivated food products
- Recreational opportunities
- Scientific study and outdoor education

## IMPACT OF DEVELOPMENT

Two critical issues can result from development occurring in the floodplain:

1. Development alters the floodplain and the dynamics of flooding
   - Urbanization decreases infiltration and increases runoff
   - Development can restrict channels and alter flowpaths
2. Buildings and infrastructure are damaged by periodic flooding
   - Hydrodynamic forces (moving water)
   - Debris impact
   - Hydrostatic forces (standing water)
   - prolonged exposure to flood waters
   - Sediment and contaminants


*Figure 2: Flooded Urban Area*

# 2. The National Flood Insurance Program

## HISTORY OF THE NFIP

After failing to curtail casualties and property damage through major flood control construction projects and disaster relief programs, Congress launched the National Flood Insurance Act in 1968 to:

- Transfer the costs of private property flood losses from the taxpayers to floodplain property owners through flood insurance premiums
- Provide floodplain residents and property owners with financial aid after floods, especially smaller floods that do not warrant federal disaster aid
- Guide development away from flood hazard areas
- Require that new, substantially improved and substantially damaged buildings be constructed in ways that would minimize or prevent damage in a flood

Floodplain management is officially defined by the federal government's Unified National Program for Floodplain Management as "a decision-making process that aims to achieve the wise use of the nation's floodplains" by both reducing flood losses and protecting the natural resources and functions of floodplains.

Numerous amendments and other acts have modernized the NFIP and changed how rates are assessed and applied, but the main purposes of the program are the same.

## HOW THE NFIP WORKS

The NFIP is based on a mutual agreement between the federal government and the community. Federally guaranteed flood insurance is made available to property owners in those communities that agree to regulate development in their mapped floodplains.
There are four central components that make up the current program:

**1. Mapping**
FEMA has prepared a floodplain map and developed flood hazard data for most of the flood prone communities in the country. The maps and data are used for several purposes:

- Communities, states, and federal agencies use them as the basis for regulating new construction and substantial improvements in a flood hazard area;
- Lenders and federal agencies use them to determine when flood insurance must be purchased as a condition of a loan or financial assistance.

**2. Insurance**
NFIP flood insurance can be purchased to cover any building or building contents located in a community participating in the NFIP—even buildings not located in a mapped floodplain. Under the new pricing methodology, often referred to as Risk Rating 2.0 (RR 2.0), flood insurance premiums for buildings are based on the flood risk, the amount and type of coverage (contents and structure), location, deductible amount, the design and age of the structure, and the location of building contents.

**3. Mitigation**
Under the NFIP, communities are encouraged to identify mitigation opportunities within their community that will help to reduce the impacts of flooding. This comes in the form of planning assistance and grant programs for acquisition, relocation, elevation or other floodproofing methodologies.

**4. Regulations**
The community's floodplain management regulations are designed to ensure that new buildings will be reasonably protected from damage by flooding and that development within the flood hazard area will not increase the flood hazard. Sometimes, these building restrictions can be met with community pushback, but they are needed to remain part of the NFIP.

## NFIP ROLES AND RESPONSIBILITIES

Community: Enacts and enforces floodplain management regulations
State (IDNR): Establish minimum state regulatory requirements, provide technical assistance
Federal: Advise local officials, assessing compliance, maps and data, grants, training and federally backed flood insurance

## JOINING THE NFIP

Community participation is voluntary but widespread because of the benefits. The community must adopt and submit a floodplain management ordinance that meets or exceeds the minimum NFIP and State criteria.

## SANCTIONS FOR NON-PARTICIPATION

- Flood insurance will not be available
- Existing flood insurance policies will not be renewed
- No direct federal grants or loans for development may be made in identified flood hazard areas under programs administered by federal agencies
- Federal disaster assistance will not be provided to repair insurable buildings
- No federal mortgage insurance or loan guarantees may be provided in identified flood hazard areas

# 3. How Flood Maps Are Prepared

Early flood maps, referred to as Flood Hazard Boundary Maps (FHBMs), were based on approximate studies with no Base Flood Elevations (BFEs) established. All communities in Iowa have had their FHBM replaced by a Flood Insurance Rate Map (FIRM). A FIRM typically is based on a Flood Insurance Study (FIS) and includes flood elevations and other hazard information needed to better inform communities of flood risk. Today, all Iowa counties have digital countywide FIRMs that are readily available.

## FLOOD STUDY TERMINOLOGY

**Base Flood:** The 1% annual chance or 100-year flood adopted by the National Flood Insurance Program as the basis for mapping, insurance rating, and regulating new construction

**Base Flood Elevation (BFE):** The elevation (above sea level or other datum) of the crest of the base flood

**Flood Insurance Rate Map (FIRM):** An official map of a community, on which FEMA has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to the community

**Flood Insurance Study (FIS):** A report published by FEMA for a community in conjunction with the community's Flood Insurance Rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM

**Special Flood Hazard Area (SFHA):** The base floodplain displayed on FEMA maps. It is the area to be regulated by the floodplain management ordinance.

## RIVERINE FLOOD STUDIES

Riverine flooding is the most prevalent flood hazard that is depicted in the FEMA flood studies within Iowa. Riverine flooding occurs in rivers, streams, ditches, or other waterways that are subject to overbank flooding, flash floods, and urban drainage system flooding. Riverine studies involve the collection and analysis of information about the river's watershed, the topography of the land along the river, precipitation, and the characteristics of the river itself.

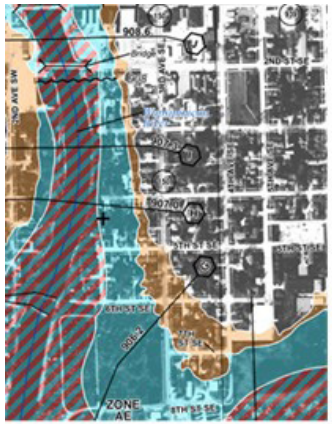



*Figure 3: Example FIRM Screenshot*

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

**Flood Discharge:** The rate at which the runoff reaches the stream and flows downstream

**Terrain Data:** Data on the shape of the stream and changes in the floodplain that are obtained from field surveys, aerial photos, topographic maps, or Light Detection and Ranging (lidar) data

**Cross Section:** Surveyed information that describes the stream and the floodplain at a particular point along the stream

**Hydraulics:** The study of moving water. A hydraulic analysis in a Flood Insurance Study calculates how high and how fast a flood discharge flows

**1D Hydraulic Study:** Produces water surface elevations, velocities, and floodplain widths at each cross section for a range of flood flow frequencies

**Flood Profile:** A graph of the flood elevations along the centerline of a stream; helps reveal flood elevations at locations between cross sections

**Floodway Analysis:** The mapping of the regulatory floodway, identifying where encroachment by development can and cannot be allowed

**Floodway:** The stream channel and portion of the adjacent floodplain that must remain open to permit passage of the base flood

**Floodway Fringe:** The portion of the floodplain lying on either side of the floodway (normally, development is permitted here)

**2D Hydraulic Study:** More advanced method of hydraulic modeling that calculates flow in multiple directions

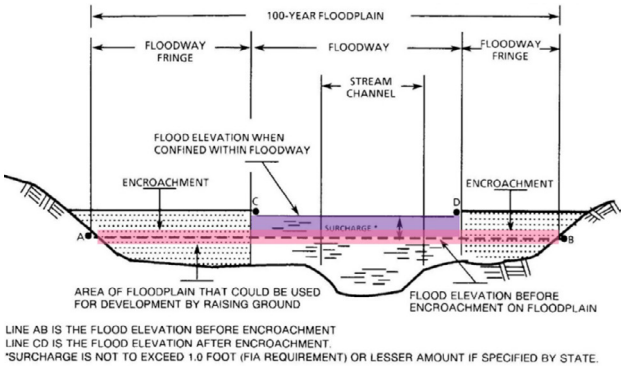



*Figure 4: Example Floodway Cross Section*

# 4. NFIP Maps

Starting in 2003, FEMA began an aggressive multi-year initiative to upgrade the country's flood maps. This included modernizing and digitizing the nations flood maps on a county wide basis instead of by community. This also updated the format of the FIRM maps to add color and consistency to the mapping applications. Iowa DNR, as a partner with FEMA has continued to update the flood maps on a watershed level.

**Map Index:** Includes community boundaries, prominent features, sometimes watershed boundaries (after 2011); shows how community is displayed on map panels; panels not printed (because of the absence of flood hazards) are identified with an asterisk

**Community Name and NFIP Number:** Unique six-digit Community Identification Number (CID); all Iowa communities start with "19"; counties have county-wide ID (CWID) number

**Elevation Reference Marks:** No longer included on FIRMs funded in 2011 or later; can be found in archived project documentation or National Geodetic Survey (NGS) website

Floodplain areas on FIRMs can consist of several different zones designations which are primarily used for insurance rating purposes. The more common zones are listed below.

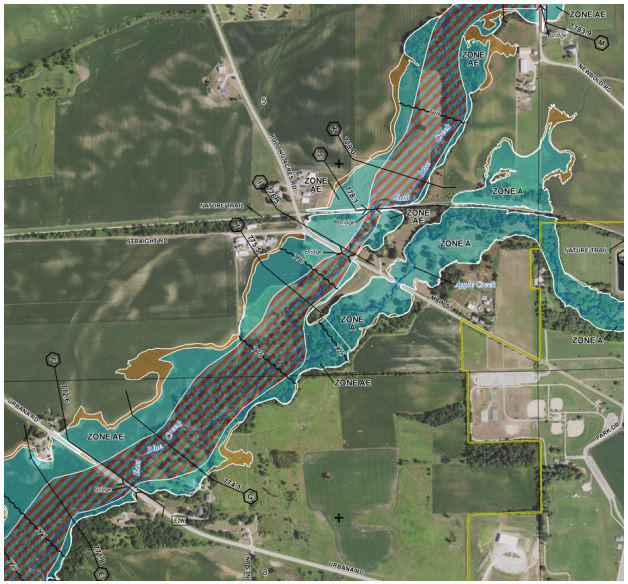



*Table 1: FIRM Map Zones*

| | |
|---|---|
| **Zone A** | Designation of the area inundated by the 1% annual chance flood (also known as the 100-year or base flood), which is also called the base floodplain. No coastal flood hazard dynamics or coastal flood hazard areas determined. There are seven types of A Zones:<br>**A** The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFE) or depths are shown within this zone.<br>**AE** The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from hydraulic analyses are shown within this zone.<br>**AO** The flood insurance rate zone that corresponds to the 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where the average depths are between 1 and 3 feet. Average whole foot depths derived from the hydraulic analyses are shown within this zone.<br>**AH** The flood insurance rate zone that corresponds to the 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole foot BFEs derived from the hydraulic analyses are shown in selected intervals in this zone.<br>**AR** The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.<br>**A99** The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a federal flood protection system where construction has reached a specific statutory milestone. No base flood elevations or flood depths are shown within this zone. |
| **Zone V** | **V** The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.<br>**VE** The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown in this zone as static whole foot elevations that apply throughout the zone. |
| **Zone X (shaded)** | Area of moderate flood hazard, usually the area between the limits of the 1%- and 0.2%- annual chance floods. It can also be an area of the 1% annual chance flood (1) with average depths of less than one foot, (2) with a drainage area less than one square mile, or (3) areas of reduced flood risk due to levees. |
| **Zone X (unshaded)** | Area of minimal flood hazard, usually depicted on FIRMs as above the 0.2% annual chance flood level. |
| **Zone D** | Area of undetermined but possible flood hazard. |

# 4. NFIP Maps (cont'd)

In addition to identifying floodplain zones, FIRMs also include:

- 1% annual chance floodplain (blue hatching, Zones A, AE, AH, or AO)
- 0.2% annual chance floodplain (black or orange hatching)
- Floodway (white or red hatching)
- BFE (wavy lines, prior to 2011)
- Cross section lines, nearest 10th of a foot (after 2011)
- Profile baseline (indicates path of riverine flood flows)
- Jurisdiction (defined political boundaries)

FIRMs completed after 2011 have transferred the index, listing of communities, and map repository tables into the FIS. Additional colors and hatching were also introduced. For any floodplain mapping projects funded in fiscal year 2020 or later, the FIRM panels must be developed using FEMA's Automated Map Production (AMP) tool. AMP will read the data in a submitted FIRM database and use a series of cartographic algorithms to autogenerate FIRM panels and indexes that comply with FEMA requirements.

FIRMs can be in the National Flood Hazard Layer (NFHL), a geospatial database that includes current effective flood hazard data and letters of map revision produced across the nation.

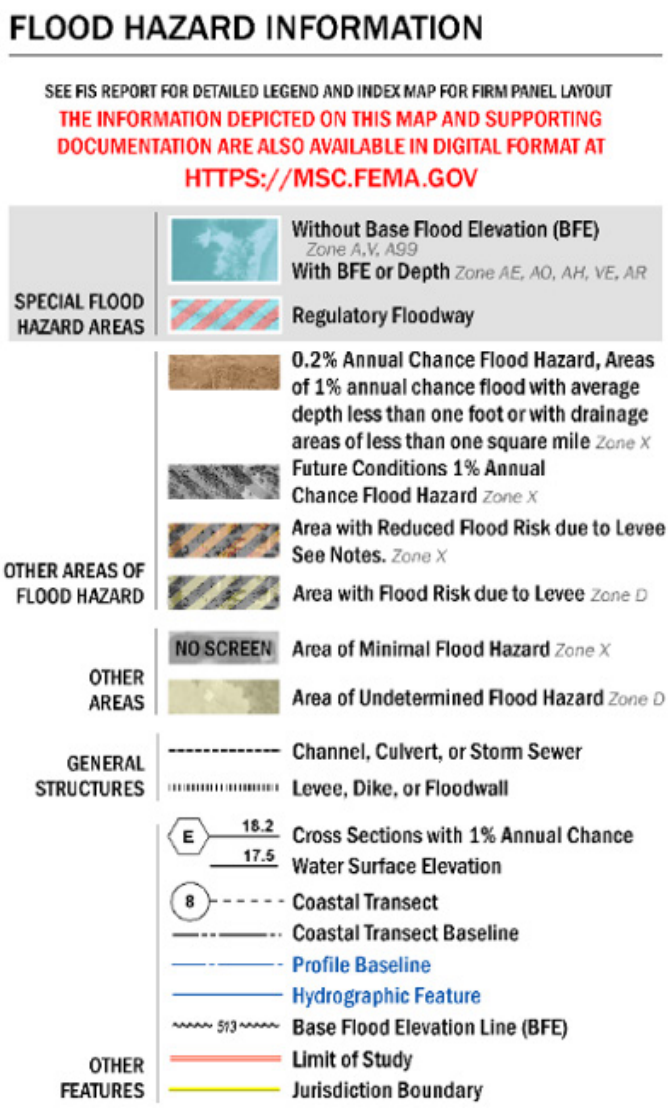



*Figure 5: Example FIRM Legend*

# 5. Using Maps and Data

## FLOOD INSURANCE STUDY (FIS) REPORTS

The FIS report is the companion to the FIRM and the FIRM database in the depiction and communication of regulatory flood hazard information. Starting in 2011, the FIS report format was changed to be more tabular in order to align with FIRM database formats for consistency. The new format also includes the FIRM index, notes to users, and map legend. The following sections of the FIS report are consistent regardless of location and scope of study:

**Section 1** – introduction, purpose, jurisdictions included, notes to user, index figure, map legend

**Section 2** – background information on floodplain management applications of the study

**Section 3** – insurance applications of the flood study

**Section 4** – area description (basins, principal flood problems, dams or levee systems)

**Section 5** – description of engineering methods used (hydrologic and hydraulic)

**Section 6** – description of mapping methods used

**Section 7** – information about contracted studies within the report and community meetings

**Section 8** – location of map repository, federal and state contact information

**Section 9** – bibliography and references

Out of a total of 32 individual tables that make up modern FIS reports, three of the most useful for floodplain managers to become familiar with are listed below.

**Table 9** – summarizes peak flood discharge determined for various flood frequencies within the study area, including size of drainage area/watershed

**Table 13** – roughness coefficients (or, 'Manning's n values') describing flood channel, impact the flood elevation calculated by hydraulic model

**Table 23** – floodway data table (FDT) listing specific data for each flooding source having a regulatory floodway (includes cross sections, distances, widths, section areas, mean velocities, base flood elevations under different scenarios)

The data contained in FIS reports are consistent with those found in the hydrologic and hydraulic analyses, FIRMs, digitally produced FIRMs, and in the NFHL database. The order of precedence for determining BFE is: floodway data table, flood profile data, FIRM data.

## FIRMS

The FEMA Map Service Center (MSC) website provides several tools to view the effective floodplain data and help narrow your search for a specific property, view the flood hazard data online, and locate the correct FIRM panel. In addition to the FEMA MSC, flood hazard information regarding a site location may be found using the NFHL.

A bank or lender may request information to determine if a property is in or out of the SFHA. Communities should be aware that lenders are legally responsible for determining if a flood insurance policy is required for a loan. Under the National Flood Insurance Reform Act, if someone other than a lender provides map information to decide if a flood insurance policy is required as a condition for a loan, the information must be guaranteed. This information is usually provided on FEMA's Standard Flood Hazard Determination Form. Note that if you are asked to sign such a form, you are guaranteeing the accuracy of the determination, so you may assume some liability for your action.

***Determining Mileage (Stationing)***

To determine the BFE at a development site, the stream mileage (stationing) for the site will need to be determined by:

1. Locating your site on the FIRM
2. Identifying the nearest labeled cross sections upstream and downstream of site
3. Measuring the distance from your site to these cross sections using map scale
4. Using these distances to find site location on flood profile and determine BFE

***BFEs on FIRMs***

BFEs can be shown on the FIRMs as whole numbers for older FIRMs but recent FIRMs may show BFEs to the nearest half foot or tenth of a foot as well as the actual BFE value labeled on mapped cross sections.

***Locating the Floodway Boundary***

If the floodway width measured on the map at a site is at a cross section and does not agree with the width in the FDT, the map should be used because it is the floodway depiction officially adopted by the community. **If the difference between the map width at the site and the cross-section width in the FDT is greater than map tolerance (25 feet), contact the Iowa Department of Natural Resources (DNR) and/or the FEMA Region 7 Office for a resolution.**

# 5. Using Maps and Data (cont'd)

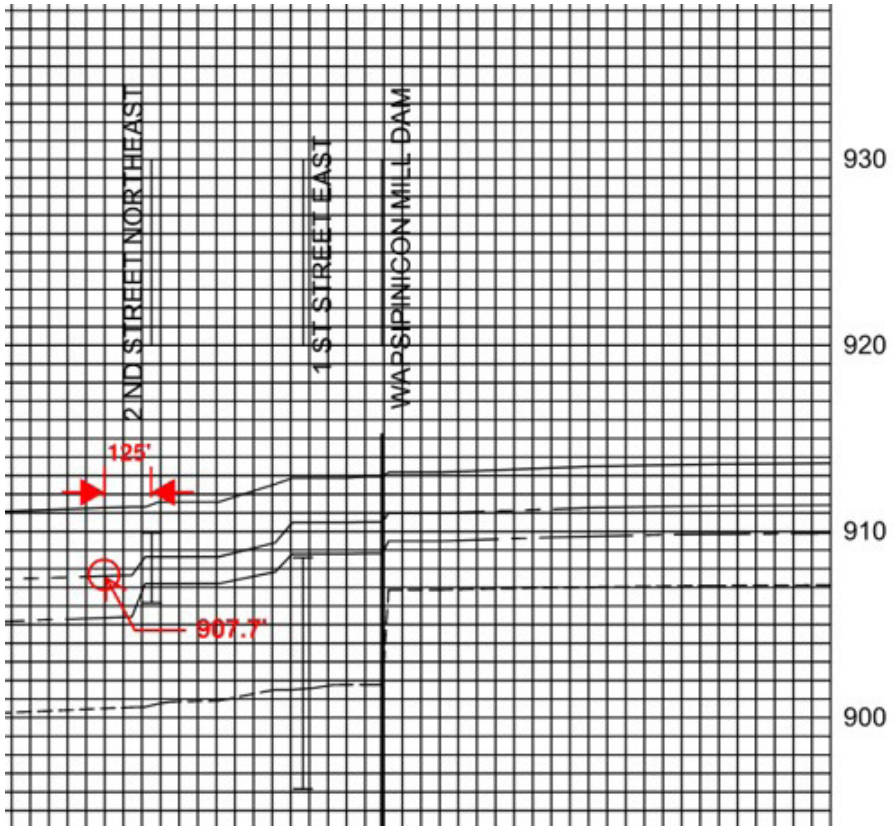
## FLOOD PROFILES

Up to five flood profiles are shown on the flood profile fold-out sheets at the back of the FIS report: the 10%, 4%, 2%, 1% (base), and 0.2% floods.

The flood profile sheet of an FIS also contains: a plot of the stream bed, the locations of cross sections used, the location of dams and other hydraulic structures, the location of bridges and roads, and stream connections. The data are plotted on a grid to facilitate their interpretation.

To determine a BFE for a site using flood profiles:

1. Locate features near the site on the FIRM, such as a bridge or cross section
2. Measure the distance from site to feature(s) along stream centerline
3. Find features on flood profile
4. Check scale used for flood profile and measure distance from feature(s) to site
5. Locate site on flood profile line and read elevation on y-axis for BFE



# 6. Maintaining and Revising NFIP Maps

A community participating in the NFIP is obligated by its agreement with FEMA to submit new or revised map information when it becomes available. **In Iowa, proposed changes to an existing flood study must first be approved by the DNR for urban areas that drain two square miles or more and rural areas that drain 10 square miles or more.**

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

- Correcting errors in non-flood-related features (usually street labels, text updates, and minor errors; often corrected with Notice To User (NTU) – no regulatory change)
- Including better ground elevation data or reflecting changes in ground elevation in the floodplain (may require Letter of Map Amendment (LOMA) of Letter of Map Revision (LOMR) depending on scope of update)
- Reflecting new flood data (updated hydrology and hydraulics modeling)
- Incorporating manmade alterations to the floodplain (manmade projects that raise BFE by equal to or greater than 0.1 feet necessitate a map revision)

## TYPES OF MAP CHANGES

FEMA uses two methods to make flood map changes. Sometimes, if the change is significant and affects a large area or numerous FIRM panels, a Physical Map Revision (PMR) is required and results in a new FIRM panel and FIS. More commonly, a document is issued to describe the map change – called a **Letter of Map Change (LOMC)**. The six different types of LOMCs are describe below.

*Letter of Map Amendment (LOMA)* – can be requested if it can be shown that a structure or property (or portion of property) is on natural high ground that is at or above the BFE; requires elevation information produced through field survey by licensed land surveyor or engineer

*Conditional Letter of Map Amendment (CLOMA)* - property owners and developers who intend to place structures in the SFHA may need to demonstrate to lending institutions and local officials before construction that proposed structures will be above the BFE; if the project involves only the elevation of structures on natural high ground (i.e., not elevated by fill), they can request a CLOMA from FEMA that states whether a proposed structure would or would not be removed from the SFHA if built as proposed

*Letter of Map Revision Based on Fill (LOMR-F)* - makes a determination on whether a structure or property can be removed from the SFHA based on the placement and proper compaction of fill outside of the regulatory floodway; for a property or structure to be removed from the SFHA, it must be demonstrated that the appropriate feature(s) are at or above the BFE

*Conditional Letter of Map Revision Based on Fill (CLOMR-F)* - a document from FEMA with its comment on whether a parcel of land or proposed structure would be inundated by the base flood if fill is placed on the parcel and/or the structure is built as proposed

*Letter of Map Revision (LOMR*) - a letter from FEMA officially revising a portion of the effective FIRM and any associated FIS sections to show changes to floodplains, regulatory floodway, and/or flood elevations; a LOMR is normally based on revised hydraulic modeling and usually will not involve specific lots, properties, or structures; can be issued by FEMA to communities that have a flood control project under construction

*Conditional Letter of Map Revision (CLOMR)* - under this process, engineering data may be submitted for a proposed project or future condition with a request that FEMA review the data and issue a CLOMR describing the revisions that may be made upon completion of the proposed work; can be submitted for any project, but required for proposed revisions involving the regulatory floodway; a follow-up LOMR is required upon project completion

A processing fee is charged for LOMRs, LOMR-Fs, CLOMRs, CLOMAs, and CLOMR-Fs. There is no fee for FEMA's review of a LOMA.

## REQUESTING MAP CHANGES

FEMA's maps are based on the best available information at the time the study was completed. As better information becomes available or as changes are proposed in the floodplain, the floodplain maps should be updated. The applicant is often the party that would benefit the most from a new map. Usually, this is a property owner or developer who wants to eliminate the flood insurance purchase requirement or the extra floodplain building regulations.

# 6. Maintaining and Revising NFIP Maps (cont'd)

The following steps should be followed when requesting a map change.

**Step 1:** Obtain FEMA forms
There are three different forms for different types of LOMCs, and all can be found on FEMA's website. The MT-1 form handles LOMAs, CLOMAs, LOMR-Fs, and CLOMR-Fs. The MT-2 form handles LOMRs and CLOMRs. The MT-EZ form is the shortest and simplest and handles LOMAs for a single residential lot or structure.

**Step 2**: Prepare needed information
In addition to FEMA forms, information such as property legal documents, maps, annotated FIRM, certified elevation, structural specifications, Community Acknowledgement forms for LOMR-F, CLOMR-F, and LOMAs, Endangered Species Act compliance for CLOMRs and CLOMR-Fs may need to be submitted.

**Step 3:** Submit the request to DNR (LOMR and CLOMR only)

**Step 4:** Submit FEMA forms and necessary attachments by mail or online
*Applicants are encouraged to submit via the Online LOMC tool but can also submit hard copy (paper) submittals to the LOMC Clearinghouse. See FEMA's website for the latest application forms and submittal instructions, including the latest mailing address.*

**Step 5:** FEMA forwards the request
FEMA forwards the request to a contractor for processing, followed by corroboration by FEMA and distribution to the affected community.



# 7. Regulatory Framework

"Statutory authority" means the powers given to a community by state law. In Iowa, city and county home rule amendments to the constitution were passed in 1968 and 1978, respectively, that give cities and counties the authority to govern local affairs to the extent that they are not in conflict or inconsistent with state statute. If a government or other organization undertakes a development project that would violate the flood protection standards of your ordinance, it should be required to show how its statutory authority exempts the project.

## TAKING

The term "taking" has come to mean any action by a government division that relieves a person of his or her property without payment. Very restrictive floodplain regulations as well as state and National Flood Insurance Program (NFIP) regulatory standards have been challenged as a taking in a number of cases. This is because they regulate what development can and can't occur on a floodplain property – impacting the land-use and economic returns for the owner.

Most NFIP criteria are performance standards that do not prohibit development of a floodplain site provided the performance standards are met. For example, development in the floodway is prohibited only if it increases flood heights. These performance-oriented standards of the NFIP have never been ruled as a taking.

Floodway requirements are defensible because they prevent the actions of one property owner from increasing flood damage to his or her neighbors.

## LIABILITY

The following points highlight limitations to the liability that public officials hold for flood damage.

- Government agencies are generally not liable for flood damage unless the flood was caused by a government action.
- Liability is based on negligence; a community is well defended by a properly administered program.
- It is better to have clear standards spelled out in the ordinance adopted by your governing board than to leave a lot to interpretation.
- Government employees are usually protected from liability suits.

## THE ORDINANCE

This reference assumes that your community has a floodplain management or development ordinance in effect and that it is based on one of the DNR models.

Certain communities are considered "delegated" communities by the DNR. They have authority to issue permits for certain project types without waiting for a DNR floodplain permit. Any change to a delegated community's ordinance must have DNR approval. Non-delegated communities are not required to get DNR approval of ordinance changes, but it is advisable.

Floodplain management regulations may be defined and implemented through one of four types of regulations, including: "stand-alone", zoning ordinances, building codes, and subdivision regulations ordinances.

Whether your floodplain regulations are in one ordinance or several, they should have these provisions:

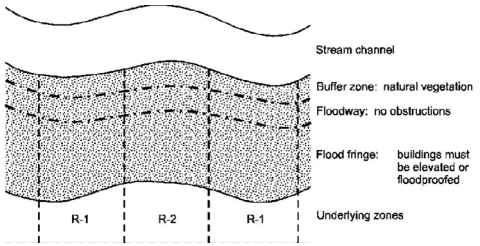



*Figure 6: Example of Overlay Zoning for Flood-Prone Areas*

- Purpose – why was the ordinance adopted? What are its objectives?
- Definitions – need-to-know technical terms
- Adoption of Flood Data – community must adopt effective FEMA FIRM
- Requirement for a Development Permit – process for obtaining a development permit
- Construction Standards – covers all minimum NFIP and state standards
- Designation of Administrator – responsible for administering ordinance
- Variances and Appeals Process – defined process for case-by-case exceptions
- Enforcement – clarifies penalties for violations
- Abrogation and Greater Restriction – legal provision specifying ordinance takes precedence over less restrictive requirements
- Severability – provisions are separable; if one is ruled invalid, rest of ordinance unaffected

## THE ADMINISTRATOR

In general, the administrator is responsible for ensuring that development activities comply with the floodplain management regulations and other applicable codes and ordinances. Common duties are as follows:

- Understand the regulations
- Ensure permit processes are followed
- Correct violations
- Process permit applications
- Maintain and update flood data and maps
- Interacting with the public
- Coordinate with other programs
- Ensure projects built correctly
- Take enforcement actions
- Keep records
- Update the ordinance

# 8. Regulatory Requirements: Maps and Data

**Basic Rule #1:** You must use the effective maps and flood data published by the Federal Emergency Management Agency (FEMA).

This requirement does not prevent a community from adopting and enforcing regulations based on data more restrictive than that provided by FEMA. This requirement also does not prevent a community from using other technical data to identify and regulate flood-prone areas not shown on FEMA maps.

The community always has an opportunity to provide input and comment on maps and data produced. FEMA offers several outreach opportunities during the FIRM and FIS update process to encourage community input and comments.

## EXCEPTIONS

1. **When the FEMA data disagrees with ground elevations**
   - If a site is in a Special Flood Hazard Area (SFHA) and field surveys show the natural ground elevation at a development site is above the BFE, the site is still subject to the regulations in the floodplain ordinance, until the site is removed from the SFHA by a Letter of Map Amendment (LOMA).
   - Sites outside the mapped SFHA but known to be below the BFE require a permit if the development site falls within the DNR's jurisdiction.
2. **When FEMA has provided draft revised data**
   - Where the original FIRM shows an SFHA with no BFEs and the draft FIRM has flood elevations, use the draft information. In the absence of other elevation or floodway data, the draft information is presumed to be the best available.
   - Where the original FIRM shows an AE or AH Zone with an elevation (or an AO Zone with a flood depth) or floodway and the revision increases the BFE or widens the floodway, the community should consider using the draft revised data. However, if the community disagrees with the data and intends to appeal, the current effective data can be presumed to be valid and may still be used until the appeal is resolved.
   - Where the original FIRM shows a B, C, or X Zone and the draft FIRM shows an SFHA, NFIP regulations do not require that the draft revised data be used. However, you are encouraged to use the draft data to regulate development, since these areas are subject to a flood hazard and new development may need a DNR permit.
3. **When FEMA provides "advisory" flood hazard data**
   - Sometimes FEMA issues advisory data after a major flood where it was found that the FIRM and/or FIS underestimated the hazard. This information is provided so communities can ensure that reconstructed buildings are protected from the true hazard, not the effective data shown on the FIRM. When you receive such advisory information, you should "reasonably utilize" it. If your community agrees with the information, the ordinance should be revised to adopt it.

*Note: These situations only apply to the use of flood data for floodplain management purposes. Insurance agents and lenders must use the effective FIRM when determining whether flood insurance is required.*

## APPROXIMATE A ZONES

An additional situation where communities may vary from the data provided by FEMA is in approximate A Zones. Approximate A Zones are those areas not studied by detailed hydrologic and hydraulic methods.

The rules in approximate A Zones depend on whether the DNR has regulatory jurisdiction. The DNR has jurisdiction over streams in:

- Incorporated (urban) areas where the drainage area is 2 square miles or greater
- Unincorporated (rural) areas where the drainage area is 10 square miles or greater

The permit applicant is required to provide the necessary data for DNR staff to calculate the BFE in an approximate A Zone.

Approximate A Zones that are outside the DNR's jurisdiction include:

- Incorporated (urban) areas where the drainage area is less than 2 square miles
- Unincorporated (rural) areas where the drainage area is less than 10 square miles

Communities outside DNR jurisdiction are still held to FEMA regulatory requirements and the DNR can provide technical assistance.

*Where do you get the flood data you need when FEMA does not publish base flood elevation on the FIRM for A Zones?*

If the information is not available through FEMA, the best place to start is to find out whether data has already been prepared by a State or Federal agency or from another project. Possible sources of existing floodplain data include Iowa DNR, Iowa DOT, County engineer, USACE, Natural Resource Conservation Service, and USGS.

If there is no existing data, the developer will usually fund a new study to determine BFEs.

Large Developments: Subdivisions larger than 50 lots or 5 acres (whichever is smaller) in approximate A zones must supply BFE data and floodway delineations if not on FIRM or FIS.

Small Developments: For small, isolated buildings outside DNR jurisdiction, historical records may be used to roughly estimate BFE levels.

# 9. Regulatory Requirements: What Requires a Permit?

**Basic Rule #2:** A permit is required for all development in the SFHA shown on your FIRM.

The NFIP defines "development" as "any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations, or storage of equipment or materials.

## KEY FLOODPLAIN DEVELOPMENT PERMIT REVIEW QUESTIONS

- Is the site near a watercourse?
- Is the site in the mapped Federal Emergency Management Agency (FEMA) SFHA?
- Is the site in the mapped floodway?
- Have other Federal permits been obtained?
- Is the site reasonably safe from flooding?
- Does the site plan show the flood zone, Base Flood Elevation (BFE), and building location?
- Is an improvement or addition to an older building proposed?
- Will new buildings and utilities be elevated properly?
- Do the plans show an appropriate and safe foundation?
- Will the owner/builder have to submit an as-built Elevation Certificate?

Regulating all development in the SFHA is essential because fill or other materials can obstruct flood flows just as structures can.

**Highways**
The Iowa DOT and DNR reached a Memorandum of Agreement in 1994 that gives the DOT some leverage when constructing highways in floodplains for:

- Rural areas with a river or stream draining less than 100 square miles
- Urban areas with a river or stream draining less than 2 square miles

Essentially, in these areas, IDOT will work with the community impacted to help meet their obligations under the NFIP. This includes conducting hydraulic studies, considering location alternatives, coordinating with local community regulators, and assisting in providing data to FEMA.
Projects with drainage areas greater than those above must be permitted through the DNR.

**Small Projects**
It is acceptable to exempt certain activities from floodplain development permitting, such as planting a garden, farming, setting up a mailbox, or adding a flagpole. It is best to clearly define these exceptions; communities can use language from the DNR model ordinance.

## NON-BUILDING REQUIREMENTS

For large developments like subdivisions, parks, shopping centers, schools, and factory-built home parks with flood-prone areas, site plan review will assure that:

1. Potential flood damage is minimized by locating structures on high ground
2. Potential flood damage is minimized for utilities like water, gas, and electric
3. Adequate drainage is provided for each building site

Water and wastewater treatment systems have their own special considerations when being permitted to minimize or eliminate infiltration, contamination, and impairment of operations.

It is advised that the water-reactive and hazardous materials be prohibited below the BFE.

## PERMITS FROM OTHER AGENCIES

You should not issue your local permit until you are certain that the other agencies' requirements are met. To implement this requirement, you are encouraged to develop a list of what permits are required in your jurisdiction, a process the DNR can assist with.

# 9. Regulatory Requirements: What Requires a Permit?

## IOWA DNR PERMITTING REQUIREMENTS

Below is a table summarizing DNR floodplain permit and flood data approval requirements.

*Table 2: DNR Floodplain Permit Authority Matrix*

| **Flood data and delegation status** | **Incorporated areas** | | **Unincorporated areas** | |
|---|---|---|---|---|
| | Drainage area ≥ 2 sq. miles | Drainage area < 2 sq. miles | Drainage area ≥ 10 sq. miles | Drainage area < 10 sq. miles |
| **No detailed study (AO & approximate A Zones)** | | | | |
| No delegation of floodplain authority | Permit and flood data needed | No DNR floodplain permit required | Permit and flood data needed | No DNR floodplain permit required |
| Floodplain authority delegated to community | DNR approves flood data | No DNR floodplain permit required | DNR approves flood data | No DNR floodplain permit required |
| **Detailed data available (AE, AO, and AH Zones)** | | | | |
| No delegation of floodplain authority | Permit needed | No DNR floodplain permit required | Permit needed | No DNR floodplain permit required |
| Floodplain authority delegated to community | Permit needed only for bridges and flood protection systems | No DNR floodplain permit required | Permit needed only for bridges and flood protection systems | No DNR floodplain permit required |

# 10. Regulatory Requirements: Floodways

**Basic Rule #3:** Development must not increase the flood hazard on other properties.

The FIS defines the floodway and floodway fringe, which is then included on FIRMs. The floodway is the channel of a river or other watercourse and the adjacent land areas that must be reserved to pass the 1% annual chance flood discharge (also known as the 100-year or base flood) without increasing the base water surface elevation more than one foot (determined with the help of computer models).

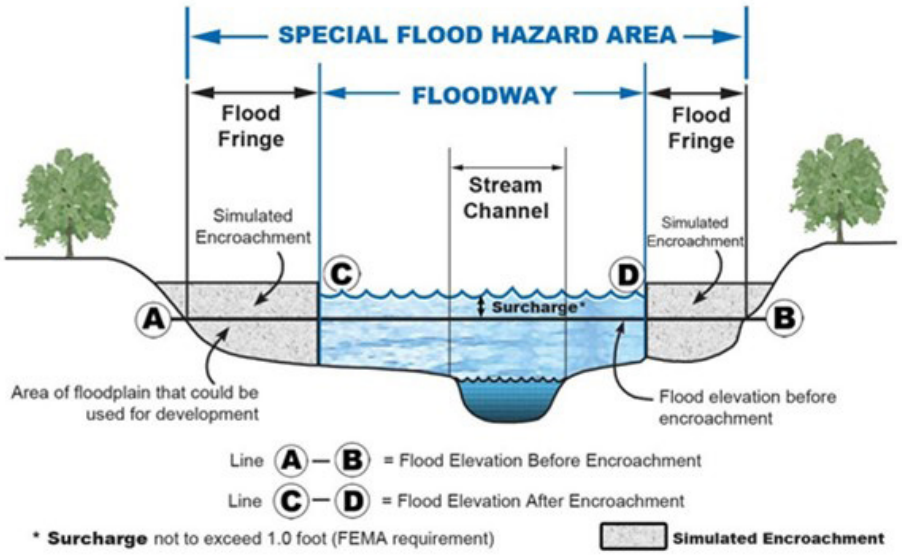



*Figure 7: Floodway Cross Section*

## FLOODWAY RULES

In some areas, floodways have not been designated because of high costs and historically low development pressure. For communities without Zone AE floodplain studies, the DNR must be contacted to establish floodplain and floodway limits and, in most cases, to issue a permit.

If your community has a FIRM with BFEs but no mapped floodway, it is required that no new construction, substantial improvements, or other development (including fill) be permitted within Zones A1-30 and AE on the community's FIRM, unless demonstrated that development will not increase water surface elevation of base flood by more than one foot at any point.

In communities with established floodways, development must be prohibited in the floodway unless it can be shown through hydrologic and hydraulic analyses that encroachment will not result in any increase (0.0 feet) in flood levels during the base flood.

If the site is in an identified fringe (in other words, outside of the floodway), you know the development or construction project will not cause an increase in flood heights above that already accounted for by the delineation of the floodway.

## DNR JURISDICTION

The Iowa DNR regulates certain floodplains and floodways in the state (these authorities are detailed in Table 2).

*Delegated Communities*
Communities that have received DNR delegation and have Zone AE studied streams are responsible for permitting development in the mapped floodways.

Communities that have received DNR delegation that have Zone A floodplain maps must contact the DNR at the time of a permit application to assist in delineating the floodway and establishing a BFE.

Once a floodway is identified, the community is responsible for issuing the floodplain development permit.

*Non-Delegated Communities*
All construction and development projects must be submitted to the DNR for review.

# 10. Regulatory Requirements: Floodways (cont'd)

*Exemptions*
Activities such as installing a signpost, constructing a driveway or road at grade, burying pipelines that follow natural contours, and installing recreational, non-floating boat docks on certain large bodies of water are exempt from DNR review.

## ADDITIONAL RESPONSIBILITIES FOR DELEGATED COMMUNITIES

All projects in the floodway must undergo an encroachment review to determine their effect on flood flows and ensure that they do not cause problems. Development projects in the flood fringe by definition do not increase flood heights above the allowable level, so encroachment reviews are not needed.

The preferred approach is to avoid all development in the floodway so that it may complete its function of carrying floodwater, unimpeded. However, as stated above, development is allowed if it can be shown through proper engineering studies that it will result in no rise (0.0 feet) in flood levels during the base flood.

Most local permit officials require that floodway encroachment reviews be done by an engineer at the owner's expense – often called a "no-rise certification".
Activities permitted in the floodway (if they do not alter flood flows through grading or filling) include agricultural uses, loading/parking areas, recreational uses, and lawns.

Activities permitted upon issuance of a conditional use permit include accessory structures, temporary amusement enterprises, drive-in theaters, car lots, billboards, sand/gravel extraction, marinas/piers, utility transmission lines, and underground pipelines.

# 11. Regulatory Requirements: New Buildings

**Basic Rule #4:** New buildings must be protected from damage caused by the base flood event.

The term "building" or "structure" does not include open pavilions, bleachers, carports, and similar structures that do not have at least two rigid walls and a roof.

Residential and nonresidential buildings are treated differently. If building in the floodplain, a residential building must be elevated to the design flood elevation (flood protection elevation for the purposes of this reference). Nonresidential buildings, on the other hand, may be elevated or floodproofed.

**Freeboard:** A margin of safety added to the BFE; the state of Iowa requires a minimum freeboard of one (1) foot above the BFE

**Flood Protection Elevation (FPE)**: A term used in this reference for the BFE plus freeboard

*Flood Protection Elevation = Base Flood Elevation + Freeboard (1 foot in Iowa)*

In Zones A, AE, AO, and AH, all new construction and substantial improvements of residential structures must be elevated so that the lowest floor (including the basement) is elevated to or above the flood protection elevation. This can be done with fill, piles/posts/columns, and/or crawlspaces. To ensure that a building is elevated above the flood protection elevation, the lowest floor is surveyed, and an Elevation Certificate is completed by a licensed surveyor or engineer. A copy is kept by the local permit office.

## ENCLOSURES

Enclosures, as referenced here, are areas created **by continuous foundation walls below the flood protection elevation** (crawlspaces, not basements). They deserve special consideration because of the risks posed by hydrostatic and hydrodynamic forces from floodwaters and because of the potential for owners to convert them into finished spaces, which is not allowed.

Three permissible uses of enclosures according to NFIP regulations are building access, vehicle parking, and storage of materials that have low flood damage potential.

Materials like carpeting, paneling, insulation, and drywall are not allowed in enclosures.

All utilities and ductwork in enclosures must sit above the flood protection elevation. Openings must be installed in the walls of the enclosure to avoid damaging floodwater forces and meet the following criteria:

- At least two openings with a total net area of not less than one square inch for every square foot of enclosed area subject to flooding
- The bottom of all openings shall be no higher than one-foot above grade
- Openings may be equipped with screens, louvers, valves, or other coverings provided they permit the automatic entry and exit of floodwater

## FLOODPROOFING

The NFIP requires that all nonresidential structures within Zones A1-30, AE, and AH either be elevated or floodproofed, with associated utilities, so that walls below the BFE are watertight, impermeable, and structurally resistant to hydrostatic and hydrodynamic loads. A registered engineer or architect is required to certify that construction methods meet standards.

Floodproofing techniques that require human intervention (e.g., turning a valve or switch) or an outside source of power are allowed by the NFIP but should be discouraged.

## AO ZONES

Shallow flooding zones where a depth but no flood elevation is provided have different rules for new construction and substantial improvements. Elevating must occur:

- At least one foot above the depth number specified on the community's FIRM OR
- At least two feet if no depth number specified

## BASEMENTS

Basements below the BFE are NOT allowed in new buildings. Flood insurance coverage is very limited in basements.

Two Iowa communities—City of Clive, and La Porte City—have received a residential basement floodproofing rating credit (exception) from FEMA. Residential basements are allowed, provided a FEMA Residential Basement Floodproofing Certificate is completed.

# 11. Regulatory Requirements: New Buildings (cont'd)

## ANCHORING

Anchoring measures beyond conventional construction practices, such as using extra bolts to connect the sill to the foundation or installing rods to connect the cap to the sill, should be required in three situations:

- Where base flood velocities exceed five feet per second
- In areas subject to waves and high winds
- n manufactured homes

## FLOOD RESISTANT MATERIAL

If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall be constructed with materials resistant to flood damage.

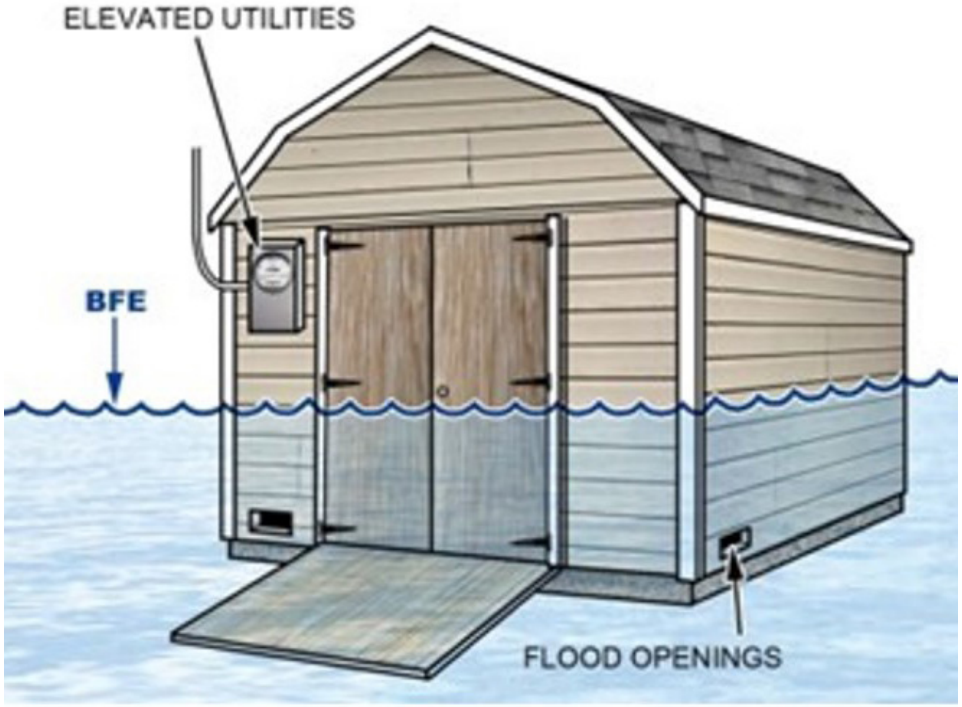
*See Desk Reference Chapter 11.5.4 for a list of materials.*

## ACCESSORY, AGRICULTURAL, AND FACTORY-BUILT STRUCTURES

Accessory structures for residential uses (like detached garages and sheds) in the floodway fringe may be exempt from full building protection standards if it is properly anchored and designed to withstand floodwaters.

Agricultural structures must be either elevated above the BFE or dry floodproofed at or above the BFE. Communities may request a community-wide exception from FEMA for wet floodproofing.

Factory-built homes must be elevated above the BFE with permanent foundations.



# 12. Regulatory Requirements: Existing Buildings – Improvements and Repairs

**Basic Rule #5:** If the cost of improvements or the cost to repair the damage equals or exceeds 50 percent of the market value of the building, it must be brought up to current floodplain management standards. This requirement also applies when the original floor area of a building is increased by 25 percent.

**Substantial Improvement:** Any reconstruction, rehabilitation, addition, or other improvement to a structure, the total cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement; or any addition which increases the original floor area of a building by 25 percent or more.

*Substantial Improvement:*
*(Cost of Improvement Project/Market Value of Building)≥ 50%*

For multiple projects, count all costs totaled over one year to determine percent of value spent.

Costs include structural elements, interior finishing elements, utility and service equipment, demolition, labor, built-in appliances, overhead, profit, and repairs.

Costs do NOT include plans and specs, carpeting over a finished floor, survey costs, permit fees, post-storm clean-up, landscaping, sidewalks, fences, yard lights, swimming pools, screened pool enclosures, detached structures, and landscape irrigation systems.

**Lateral Addition (Residential):** If the common wall is demolished, then the entire structure must be elevated; if only a doorway is installed with minimal finishing, only the addition must be elevated.

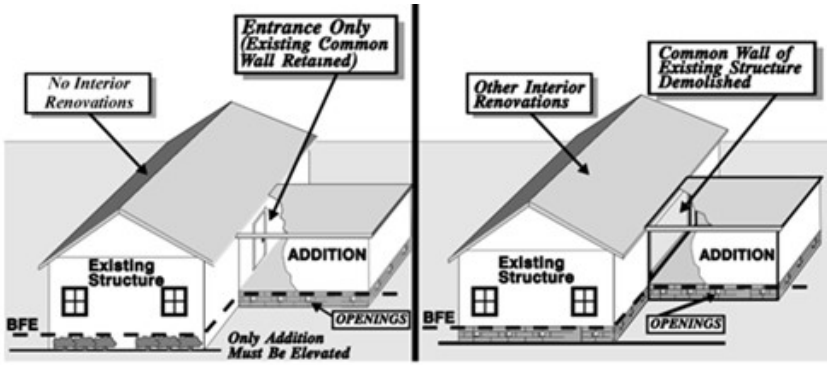



*Figure 8: Lateral Additions to a Residential Building*

**Vertical Addition (Residential):** When the proposed substantial improvement is a full or partial second floor, the entire structure must be elevated.

**Post-FIRM Buildings:** All additions to post-FIRM buildings are defined as new construction and must meet the requirements of the floodplain management ordinance regardless of size or cost

**Substantial Damage:** 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 percent of the market value of the structure before the damage occurred.

*Substantial Damage: (Cost to Repair/Pre-damage Market Value of Building)≥50%*

* The **cost to repair** the structure must be calculated for full repair to the building's before-damage condition, even if the owner elects to do less. It must also include the cost of any improvements that the owner has opted to include during the repair project.

FEMA has developed a software program, Substantial Damage Estimator Software (SDE 3.0), to help local officials make substantial damage estimates.

## INCREASED COST OF COMPLIANCE

Applicable when the local floodplain management ordinance requires elevation or retrofitting of a substantially damaged building, Increased Cost of Compliance (ICC) coverage not only pays for repairs to the flooded building, but also pays up to $30,000 for the cost of complying with the elevation requirements of the ordinance.

There are some limitations to ICC:

- Payment is dependent on bringing the building into compliance
- It is only available if there is a current NFIP policy on the building before/during flood
- It covers only damage caused by a flood
- Claims are limited to $30,000 per structure
- Must include substantial damage determination completed by floodplain administrator

# 12. Regulatory Requirements: Existing Buildings – Improvements and Repairs (cont'd)

Reconstructions of **destroyed buildings** are considered "new construction" and must be brought to current floodplain management ordinance standards.

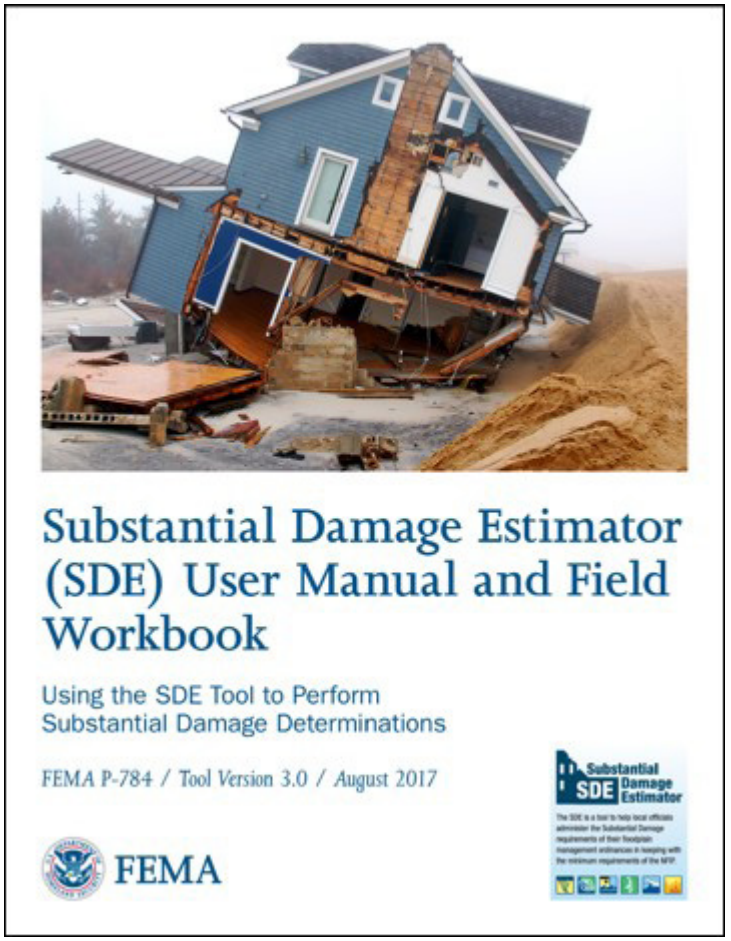
## EXCEPTIONS

There are three possible exceptions to the substantial improvement and substantial damage requirements:

- Exempt expenses
- Historic buildings
- Projects required by code (involuntary correction of a violation that existed before)

*Example: Code Violation Exception*

*A building whose pre-damage market value was $100,000 suffers damage with total cost to repair at $45,000. Before damage, the city had cited code violations for electrical wiring, smoke detectors, and inadequate bathrooms totaling $8,000. Since citations were issued before the damage, code requirements are not counted toward cost to repair. Total cost to repair remains under 50% and building is not considered substantially damaged.*



# 13. Additional Regulatory Standards

FEMA requirements AND state laws must be enforced. Additional regulations should be considered.

## LOCATION RESTRICTIONS

This is the most restrictive higher regulatory provision and allows communities to prohibit all or certain types of development where the hazard is severe.

Highly **hazardous areas** with exposure to life threatening situations such as areas prone to ice jams and flash flooding are most appropriate for location restrictions.

Communities can encourage (and sometimes mandate) subdivisions to be designed so that buildings do not become isolated by floodwaters and so at least part of the floodplain remains conserved as a natural area.

**Setbacks** establish minimum distances that development must be positioned away from river channels. This helps protect structures from erosion, protect riparian habitat, and minimize the effects of non-point sources of pollution.

Many communities restrict factory-built homes from being placed in the flood hazard area.

Communities should consider zoning its floodplains for agricultural or other low-density uses.

## BUILDING REQUIREMENTS

*Freeboard*
As previously discussed, the state of Iowa requires one foot of freeboard elevation on top of the base flood elevation. Freeboard helps:

- Account for future increases in flood stages if additional development occurs
- Account for future flood increases due to upstream watershed development
- Act as a hedge against backwater conditions caused by ice jams and debris dams
- Reflect uncertainties inherent in flood hazard modeling, topography, and mapping
- Provide an added measure of safety against flooding

Communities may wish to consider a freeboard greater than one foot for extra protection.

*Foundation Standards*
The NFIP performance standards do not specify how a building's foundations are to be constructed. Especially in areas where an engineer's certificate is not required by the NFIP regulations, more specific foundation construction standards would help protect buildings from flood damage.

## SAFETY REQUIREMENTS

*Critical Facilities*
For some activities and facilities, even a slight chance of flooding poses too great a threat. These should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be in a floodplain. If a critical facility must be in a floodplain, then it should be designed to higher protection standards and have flood evacuation plans.

FEMA defines four kinds of 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 have occupants who may not be sufficiently mobile to avoid injury or death 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.
- Public and private utility facilities that are vital to maintaining or restoring normal services to flooded areas before, during and after a flood.

*Dry Land Access*
To ensure access, some communities have enacted ordinance provisions requiring that all roads and other access facilities be elevated to or above the BFE.

*Dam Breaks*
Close to the dam, the dam breach inundation area is likely to be larger than the mapped floodplains. A community may choose to include this larger area as part of its regulatory program.

# 13. Additional Regulatory Standards (cont'd)

## FLOOD CONVEYANCE AND STORAGE

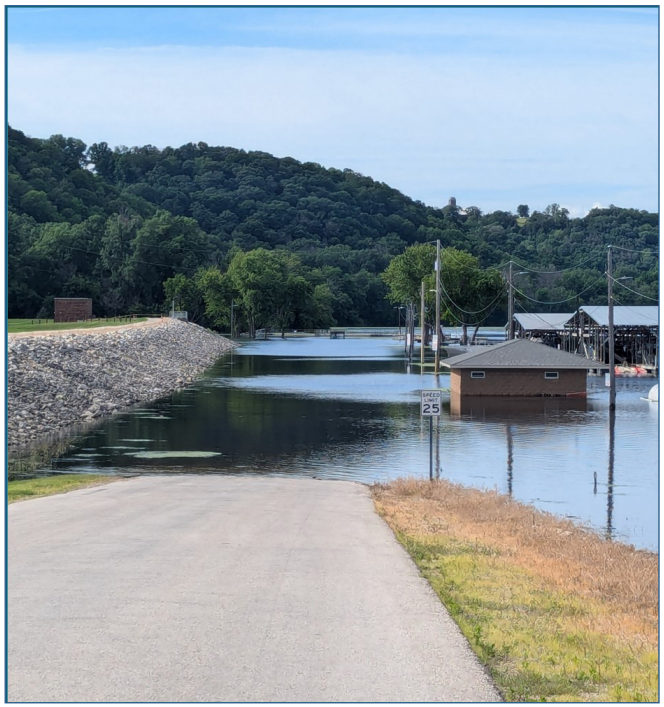
Some communities have restricted development farther from the floodway to allow for a smaller flood elevation surcharge than one foot.

Another approach is to require compensatory storage to offset any loss of flood storage capacity. The developer is required to offset new fill put in the floodplain by excavating an additional floodable area to replace the lost flood storage area.

Runoff in urban drainage areas can be severe. Communities can regulate development according to a plan that provides for stormwater management of the watershed as a whole.

## ENVIRONMENTAL PROTECTION MEASURES

Preserving natural floodplains, stream channels, and wetlands can help minimize the impacts of flooding through natural water storage processes. Communities can combine floodplain management goals with those of local environmental preservation/restoration for greater support.



## DRY LAND ACCESS

Ensure access for emergency response along critical transportation routes

# 14. Permit Review

Once the ordinance is in force, any development or change in land use requires authorization, generally in the form of a permit from the local administrator. This section reviews a standard process. It is not a mandatory process, but it does ensure that all your State and NFIP requirements will be met.

***When is a permit required?***
A permit is required for almost any development within the special flood hazard area. Development is defined as any man-made change to improved or unimproved property.

***Where is a permit required?***
You cannot exempt activities by your own community government and all development will be regulated.

***What about the actual permit form?***
Your community should have its own permit application form that includes all State and NFIP requirements. The Iowa Department of Natural Resources (DNR) has model permit application forms available upon request.

## REVIEW FOR COMPLETENESS

Some communities ensure that the permit process will go smoothly by having a formal pre-application meeting with a developer to review a preliminary plan.

The application package should contain all the administrative forms, plans, blueprints, and technical documentation required for you to review the proposed project for regulatory compliance. If the application package is incomplete, the review should stop. The applicant should be advised (in writing) of missing documents and told (in writing) that the review will not start until the missing documents are submitted.

Make sure all **administrative forms** are completed satisfactorily and properly signed.

Make sure **site plan** has all necessary features required for review.

If structures are to be built, the application must include building design plans showing:

- The kind and potential use of the structure
- Proposed lowest floor elevations of all new construction and the existing lowest floor elevations for substantially improved or substantially damaged buildings
- Proposed elevations of adjacent grades
- The type of foundation system
- The existence of any enclosure below the lowest floor, along with electrical and plumbing plans for the area, location and dimensions of openings, and materials proposed for use in an enclosure below the Base Flood Elevation (BFE)
- The height to which a nonresidential structure is to be floodproofed and the complete list of floodproofing techniques to be used, with detailed drawings

Ensure that all necessary certifications are included and properly signed. Based on the minimum NFIP requirements, two situations would require the filing of certified documents with the permit application:

- Floodproofed building: In the event a nonresidential structure is to be floodproofed, the applicant must submit a statement from a licensed professional engineer or architect certifying that the design and methods of construction meet standards
- Enclosures below the lowest floor: If an applicant designs an enclosure below the lowest floor using an alternative to the NFIP standard, a licensed professional architect or engineer must certify the design

Ensure that all necessary **federal and state permits** are being obtained.

Circulate application to **other relevant departments** for their review.

## REVIEW FOR COMPLIANCE

Examine **site information** to determine if development (building, fill, grading, excavating, etc.) is in SFHA; a permit is only required if the planned development is in the SFHA.

Review **building plans** to check proposed elevations against required flood protection elevation.

All **engineering documents** should be examined by your community's staff engineer, or a consulting engineer available to perform reviews, to ensure that acceptable technical standards were used and that calculations are correct.

When elevating a structure with an enclosure that requires flood vents, having the applicant sign and record a non-conversion agreement should be required. This

document will serve as a notice to the current owner that the enclosed area cannot be converted to a living space.

## APPLICATION APPROVAL OR DENIAL

If the proposed development is following regulations, issue a permit.

The day a permit is issued is the date of the "start of construction," provided construction begins within 180 days. Used for insurance rating purposes, this date determines what FIRM was in effect when the building was built, regardless of when ground was broken or construction was finished.

If the application is not in compliance with local regulations, the permit should be denied.



No._____

**FLOODPLAIN DEVELOPMENT PERMIT**

Specify for what purpose the permit is issued—
New construction, alterations, fill, excavation, other

ISSUED TO:_____

ADDRESS:_____

PROJECT ADDRESS:_____
(if different from permittee's address)

ISSUED BY:_____
Floodplain Management Administrator

DATE:_____
(This permit expires 180 days from this date)

THIS PERMIT MUST BE POSTED ON THE PREMISES IN A CONSPICUOUS PLACE SO AS TO BE CLEARLY VISIBLE FROM THE STREET.

*Figure 9: Sample Permit Form*

# 15. Inspections

Follow-up conversations and inspections are vital to ensure that the applicant adheres to permit requirements. The most effective way to ensure compliance is to inspect the site frequently during construction, when errors in the location or elevation of the lowest floor can be found and corrected.

A series of at least three inspections is recommended for every project, especially any project that involves construction of a building:

## PRE-CONSTRUCTION INSPECTION

- Complete before ground broken but after the site is staked out
- Check: Location of floodplain and floodway boundaries; setbacks from lot lines, channel banks, etc.; floodway encroachments; proposed elevation

## ELEVATION INSPECTION

- Complete before installation of lowest floor, timing dependent on type of foundation being constructed
- Request certified elevation from applicant
- Check: Lowest floor built at heigh stipulated in permit application; whether any fill meets necessary compaction, slope, and protection standards; building's location matches permit application; number and size of crawlspace or enclosure openings; whether any part of project encroaches into the floodway

## FINAL INSPECTION

- Complete as project nears completion
- Obtain as-built Elevation Certificate or Floodproofing Certificate (nonresidential)
- Check: Foundation and floor elevations unaltered since second inspection; enclosures below lowest floors have adequate openings; utilities above lowest floor; any floodway encroachments; compliance with issued permit
- Issue certificate of occupancy, certificate of compliance, or use permit to signify that project is complete and meets all requirements

Take site photos during inspections to document existing conditions.

Properties should be checked for compliance in semi-regular future inspections – especially for enclosures, additions, etc. Informal inspections can also be carried out after major storms or damage to help inform property owners of permitting route for rebuilding.



**FLOODPLAIN INSPECTION REPORT**

Date: _____ Inspector: _____

Permit #: _____ Applicant: _____

Project identifier/Address: _____

_____

**Type of inspection:** ☐ Pre-construction* ☐ Elevation ☐ Final ☐ Other:

**Notes on back**

**Pre-Construction Inspection***

*Office Work*

☐ Review permit file before going to the field

☐ Ask permit reviewer any questions, if necessary

☐ Check for any necessary State or Federal permits

*Field Work*

☐ Check building or development location. Measure distances from waterway or landmarks. Locate floodplain and floodway boundaries.

**Elevation Inspection**

☐ Check elevation of the lowest floor. Is it at or higher than the permitted elevation?

☐ YES, development continues ☐ **NO**, TAKE IMMEDIATE ACTION

☐ If fill is used, check fill location, compaction, and side slopes.

**Final Inspection**

☐ Elevation or Floodproofing Certificate in files (if not required from owner prior to final acceptance).

☐ Check fill and grading for any floodplain or floodway encroachment.

☐ For enclosures below the BFE, check use, number, and size of openings (at least 2 openings on different walls; openings size totals 1 sq. in./1 sq. ft. of enclosure; openings no more than 12 in. above grade.

☐ Check that the furnace, air conditioner, etc. are elevated at or above the lowest floor elevation.

☐ For factory-built homes, check anchoring.

**INSPECTION APPROVED?** ☐ YES ☐ NO, SEE NOTES ON OTHER SIDE

*If no pre-construction inspection was done, inspect these items at the time of the elevation inspection.

*Figure 10: Sample Inspection Form*

## CHECKING ELEVATIONS IN THE FIELD

1. Confirm a starting elevation from USGS survey or local records
2. Use a two-person survey team to "run the level" and relate starting elevation to height of surveying instrument
3. Use the surveying instrument to measure the height of the lowest floor

# 16. Appeals and Variances

Appeals, special uses, and variances represent exceptions to typical permit requirements and usually require judgment calls involving several people.

## APPEALS

Appeals occur when the permit applicant and permit office interpret the language of requirements differently. Disagreements will be handled according to ordinance protocol and decided by a local board.

## CONDITIONAL OR SPECIAL USE

This process allows certain uses of the floodplain and gives a community the opportunity to thoroughly review the proposed activities and place conditions on accepted uses. Common occurrences could be for a temporary carnival or marina.

## VARIANCES

Variances give a developer or property owner a way to seek permission to vary from the ordinance because of a special situation. A variance from the floodplain management standards may have a negative impact on flood insurance rates. Granting variances is a local decision that requires approval from the DNR.
In general, a variance is granted for a parcel with physical characteristics so unusual that complying with the ordinance would create an exceptional hardship to the applicant or surrounding property owners. Cost is not considered an exceptional hardship. Conditions must:

- Be unique to that property and not shared by adjacent parcels
- Pertain to the land, not to any structure, its inhabitants, or the property owners

Variances should be granted on a structure-by-structure review – never to multiple lots or subdivisions.

Issuing variances is not a good practice, even variances from your own higher local standard.

When considering a variance application, ask the following 10 questions:

1. Is the variance requested on land that is unique?
2. Would failure to grant the variance result in exceptional hardship to the applicant?
3. Is the property in a floodway?
4. Will granting the variance increase flood heights and velocities?
5. Will granting the variance increase the threat to public safety?
6. Will granting the variance result in extraordinary public expense?
7. Will granting the variance create nuisance, or cause fraud on or victimization of the public?
8. Will the water supply and sanitation systems still be able to operate and prevent disease, contamination, and unsanitary conditions?
9. Can the project be built in a flood-free location?
10. Is the project compatible with existing local plan, laws, or ordinances and with existing and anticipated development?

A variance to your state-approved ordinance needs to be approved by the DNR.

To grant a variance, the claimed hardship must be exceptional, unusual, and peculiar to the property involved. Financial hardship, inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors do not qualify as exceptional hardships.

No variance may be issued within a regulatory floodway that would result in any increase in base flood levels.

A variance from elevation requirements will most likely result in higher annual insurance premiums from NFIP.

A common case for variances is a functionally dependent use – where a facility must be located or carried out close to water for its use (e.g., docking facility, shipbuilding structure).

# 17. Enforcement

Adequate, uniform, and fair enforcement means two things:

- All development in a Special Flood Hazard Area must have a permit.
- All development with a permit must be built according to the approved plans.

If you find a violation, you should take photographs, document the problem in writing, and issue a stop work order for projects still under development. Different strategies for enforcement of ordinance requirements are presented below.

## VOLUNTARY COMPLIANCE

Attempt to convince the property owner or developer that following ordinance requirements is in their best interest concerning insurance premiums and flood damage protection.

## ADMINISTRATIVE STEPS

1. Contact the responsible party by phone to explain concerns and provide a response deadline
2. Follow-up with a written notice explaining the response required (permit application, Elevation Certificate, etc.)
3. If responsible party is resistant, send a Notice of Violation or Stop Work Order

## LEGAL RESOURCES

If resistance and violations persist, consult with your community attorney to discuss next steps.

A violation of the floodplain ordinance is classified as a misdemeanor. The DNR model ordinances provide for the use of fines as a means of enforcement. These fines are usually between $50 and $500. Iowa also allows imprisonment not to exceed 30 days.

Cities can also record the violation in the property's deed records, a process called recordation, that could make it harder to sell. A lis pendens issued by a local court has a similar effect and requires buyer satisfaction with violation resolution before purchase.

County and city boards may also order restraining orders to stop further non-compliant conduct.

Civil citations may also be issued for ordinance infractions. These are like traffic tickets and contain a fine amount and court appearance date.

## SECTION 1316

Section 1316 of the National Flood Insurance Act authorizes FEMA to deny flood insurance to a property declared in violation of the community's ordinance. T**his is the last resort of floodplain ordinance administrators to amend violations.** Without flood insurance:

- The property may be difficult to sell, and impossible to sell for those who rely on a federally insured loan to purchase the property.
- The market value of the property may fall.
- The cost of suffering flood damage without insurance may be too great a risk for the property owner.
- Lending institutions holding the property's mortgage may threaten to foreclose.
- Any permanent reconstruction will not be eligible for Federal disaster assistance.

## EXAMPLE VIOLATION AND RESOLUTION #1

Someone has placed fill in the floodway without a permit.

**Option 1:** Remove the fill.

**Option 2:** Leave the fill and get a permit.

**Option 3:** Apply for a variance.

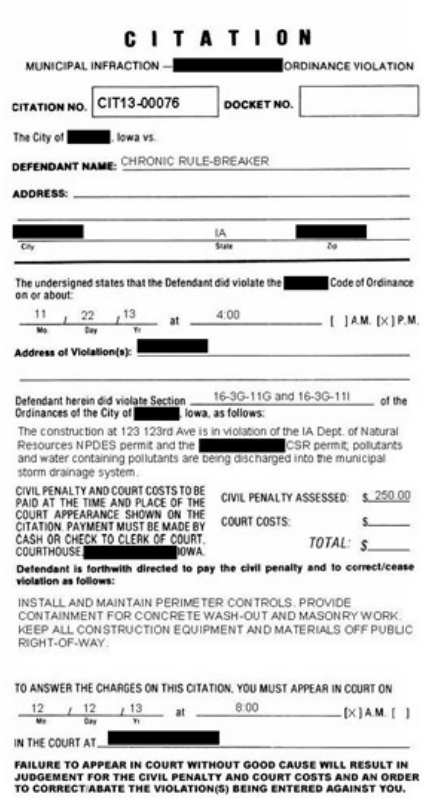
## EXAMPLE VIOLATION AND RESOLUTION #2

House is built too low.

**Option 1**: Elevate the house to standard.

**Option 2:** Allow house to remain and suffer higher insurance premiums.

**Option 3:** Demolish the house.



C I T A T I O N

MUNICIPAL INFRACTION – [redacted] ORDINANCE VIOLATION

CITATION NO. CIT13-00076 DOCKET NO.

The City of [redacted], Iowa vs.

DEFENDANT NAME: CHRONIC RULE-BREAKER

ADDRESS:

[redacted] IA [redacted]

City State Zip

The undersigned states that the Defendant did violate the [redacted] Code of Ordinance on or about:

11 / 22 / 13 at 4:00 [ ] A.M. [X] P.M.

Mo. Day Yr.

Address of Violation(s): [redacted]

Defendant herein did violate Section 16-3G-11G and 16-3G-11I of the Ordinances of the City of [redacted], Iowa, as follows:

The construction at 123 123rd Ave is in violation of the IA Dept. of Natural Resources NPDES permit and the [redacted] CSR permit; pollutants and water containing pollutants are being discharged into the municipal storm drainage system.

CIVIL PENALTY AND COURT COSTS TO BE PAID AT THE TIME AND PLACE OF THE COURT APPEARANCE SHOWN ON THE CITATION. PAYMENT MUST BE MADE BY CASH OR CHECK TO CLERK OF COURT, COURTHOUSE [redacted] IOWA.

CIVIL PENALTY ASSESSED: $ 250.00

COURT COSTS: $

TOTAL: $

**Defendant is forthwith directed to pay the civil penalty and to correct/cease violation as follows:**

INSTALL AND MAINTAIN PERIMETER CONTROLS. PROVIDE CONTAINMENT FOR CONCRETE WASH-OUT AND MASONRY WORK. KEEP ALL CONSTRUCTION EQUIPMENT AND MATERIALS OFF PUBLIC RIGHT-OF-WAY.

TO ANSWER THE CHARGES ON THIS CITATION, YOU MUST APPEAR IN COURT ON

12 / 12 / 13 at 8:00 [X] A.M. [ ]

Mo. Day Yr.

IN THE COURT AT [redacted]

**FAILURE TO APPEAR IN COURT WITHOUT GOOD CAUSE WILL RESULT IN JUDGEMENT FOR THE CIVIL PENALTY AND COURT COSTS AND AN ORDER TO CORRECT/ABATE THE VIOLATION(S) BEING ENTERED AGAINST YOU.**

*Figure 11: Sample Citation*

# 18. Records

Records show what you approved and what you told the developer, forming a paper trail needed for administrative or legal proceedings related to development projects. Permit files and electronic records should contain copies of all of the following:

- Permit Application and Attachments (including site plan)
- All Pertinent Correspondence
- Flood and Floodway Data (prepared by developer)
- Engineering Analyses of Floodway Encroachments
- Special Engineering Designs for Enclosures
- Any Variance or Appeals Proceedings
- Inspection Records
- As-Built Lowest Floor Elevation
- Elevation and/or Floodproofing Certificate
- Certificates of Compliance or Occupancy

Keeping these records is a requirement to participate in the NFIP; there is no statute of limitations as to how long they should be kept.

## ELEVATION CERTIFICATE

Use FEMA's Elevation Certificate Form for new and substantially improved structures.

- Used to certify compliance and obtain LOMAs
- Certified by registered surveyor
- Local permit official responsible for obtaining

## FLOODPROOFING CERTIFICATE

Floodproofing is only an option for nonresidential buildings. Design must consider parameters like flood warning time, floodwater velocities, and debris impact. Certificate must be signed by professional engineer.

# 19. Flood Insurance

One of the primary reasons for participating in the NFIP is to make insurance available for people who want to protect themselves financially from flood hazards. This section reviews how the insurance aspect of the NFIP works.

Flood insurance policies are obtained through local property insurance agents. The agents may sell a policy through one of the Write Your Own insurance companies or a "direct" policy through FEMA. Both approaches will result in the issuance of a Standard Flood Insurance Policy (SFIP) that meets all the requirements and rates set by FEMA.

## COVERAGE

Flood insurance coverage is provided for insurable buildings and their contents.

**Building** coverage includes the physical structure, utility equipment, carpeting, built-in appliances, and wallpaper/paneling. To be insurable a building must be principally above ground. "Principally above ground" means at least 51 percent of the actual cash value of the structure, including machinery and equipment (but not land value), is above ground. Contents are not covered unless there is voluntarily purchased contents coverage.

Things not covered under building or contents coverage include:

- Gas or liquid storage tanks
- Underground pumping stations, wells, or septic tanks
- Tents
- Swimming pools
- Open pavilions
- Carports
- Sheds on skids
- Licensed vehicles, campers, and travel trailers
- A building in violation of state or local law
- Landscaping and/or crops
- Animals and livestock
- Jewelry, artwork, furs, and similar items valued at more than $2,500
- Money or valuable papers

Limited coverage for enclosures and their contents include portable and window-type air conditioning units, clothes washers and dryers, food freezers (and the food within), required utility connections, and foundation/anchoring system. FURNACES ARE NOT COVERED.
Coverage for basements and their contents include air conditioners, cisterns, drywall, electrical junctions and circuit breakers, outlets and switches, elevators and related equipment, fuel tanks, furnaces and hot water heaters, hat pumps, nonflammable insulation, solar energy equipment, staircases, water softeners, well water tanks/ pumps, required utility connections, and foundations/anchoring system.

## INCREASED COST OF COMPLIANCE (ICC) COVERAGE

This coverage covers the costs of repairing or rebuilding a structure that has been substantially damaged to bring it into conformance with the local ordinance.
ICC coverage is mandatory for all SFIPs except:

- Those sold in Emergency Program communities
- Contents-only policies
- Dwelling Forms on individual condominium units
- Group Food Insurance

Current ICC coverage limit is **$30,000.**

Total amount of combined loss payment received and ICC coverage cannot exceed **$250,000** for residential structures and **$500,000** for nonresidential structures.




*Figure 12: Summary of ICC Applicability*

In most cases, a 30-day waiting period follows the purchase of a flood insurance policy before it goes into effect.

# 19. Flood Insurance (cont'd)

## RISK RATING 2.0

Starting in October 2021, this new system of policy rating replaced the antiquated methodology from the 1970s. Its goal is to calculate a flood insurance premium that reflects the actual risk posed to an individual property.

The following parameters are considered in Risk Rating 2.0 methodology:

- Distance to Flooding Sources
- Ground Elevation
- Building Occupancy
- Foundation Type
- First Floor Height
- Number of Floors
- Unit Location
- Construction Type
- Flood Openings
- Machinery and Equipment

## MANDATORY PURCHASE REQUIREMENT

Flood insurance is a prerequisite for receiving money from a federal agency or federally supported financial program.

The requirement also applies to secured mortgage loans from financial institutions that are regulated, supervised, or insured by federal agencies (e.g., Federal Deposit Insurance Corporation, the National Credit Union Administration).

# 20. The Community Rating System

The Community Rating System (CRS) is designed to recognize communities that go above and beyond NFIP standards – with insurance premium reductions of between five and 45 percent, depending on the activities performed.

The CRS recognizes 19 creditable activities organized under four categories.

Based on the number of credit points received for each activity, a community is ranked in one of ten CRS classes.

In Iowa, communities are automatically awarded CRS credit points for freeboard, mandatory reporting of flood risk in real estate disclosure agreements, and other activities implemented as the result of state laws. The Iowa DNR has a CRS Toolkit to help communities determine estimated effort, documentation, and potential class rating for identified activities on its website.

*Table 3: Summary of CRS Classes and Premium Discounts*

| Credit Points | CRS Class | Premium Reduction for Full-Risk Properties |
|---|---|---|
| 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 |

Communities should prioritize and implement activities that best address their local flooding problems, whether they are creditable under the CRS.

## COMMUNITY RESPONSIBILITIES UNDER CRS

There is no cost to join the CRS, but communities are responsible for upkeeping creditable activities to maintain their classification. A community in CRS is responsible for:

- Designating someone as CRS Coordinator
- Cooperating with the CRS Specialist and the verification procedures
- Recertifying each year that it is continuing to implement its activities
- Ensuring that projects and activities are compliant with federal environmental and historic preservation requirements
- Submitting the appropriate documents with its recertification
- Advising FEMA and its CRS Specialist of modifications in its activities
- Maintaining Elevation Certificates, other permit records, and old FIRMs forever
- Maintaining other records of its activities for five years, or until the next verification visit
- Participating in the cycle verification process, which is conducted every five years for Class 6-9 communities or every three years for Class 1-5 communities

The *CRS Coordinator's Manual* is a good resource for detailed information about CRS.

## CRS ACTIVITIES

The four categories of CRS activities are detailed below.

**Public Information (300 Series):** Credits programs that advise people about the flood hazard, encourage the purchase of flood insurance, and provide information about ways to reduce flood damage through a variety of public outreach activities

**Mapping and Regulations (400 Series):** Credits programs that provide increased protection to new development (e.g., mapping areas not shown on the FIRM, preserving open space, protecting natural floodplain functions, enforcing higher regulatory standards, and managing stormwater)

**Flood Damage Reduction (500 Series):** Credits programs for areas in which existing development is at risk (e.g., having a comprehensive floodplain management plan, mitigating areas prone to repetitive losses, relocating or retrofitting flood-prone structures, and maintaining drainage systems)

**Warning and Response (600 Series):** Credits measures that protect life and property during a flood through flood warning and response programs; there are special credits for maintenance of levees and dams and preparedness programs for their potential failure

# 21. Disaster Operations

This section covers hazards and the steps and procedures that your permit office should follow after a disaster.

## SAFETY HAZARDS

- Six inches of fast-moving flood water can knock over an adult
- One foot of moving water is enough to float a car
- Two feet of rushing water can carry away SUVs and trucks

Over half of all flood-related drownings occur when a vehicle is driven into hazardous flood waters. The second most common cause of deaths from flooding is electrocution from shorted electrical components in conductive water. Floods can even start fires – from damaged infrastructure.

## HEALTH HAZARDS

Floods can mix contaminated water with everyday items and damage infrastructure like water systems, wells, septic tanks, and HVAC ductwork. It is important to throw away contaminated objects and test water systems for contamination after a flood.

## MENTAL HEALTH

Worth mentioning are the mental stressors that a flooding disaster can place on communities and floodplain managers. Be aware of heightened stress and anxiety while working with the public during a recovery effort.

## BUILDING CONDITION SURVEY

This is a walking survey conducted by the permit office to determine if any damaged buildings are so dangerous that they should not currently be reentered, and which buildings will need a building permit before they can be repaired or reoccupied.

*High water marks* should be marked with spray paint or another highly visible method on telephone poles, trees, etc.

*Work maps* for making annotations during the building condition survey should be developed in advance, showing SFHA, buildings, addresses, and elevations.

A *survey team* consisting of a building inspector, utility specialist, and/or fire department staff member and one recorder should be sent together.

*Colored placards* should be placed on buildings designating their reentry status.

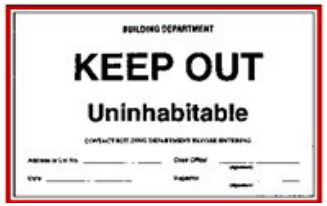



*Figure 13: Example Placard for Building Condition Survey*

A *notice to owner* should be sent to each property owner explaining which activities can and cannot proceed, along with resources for recovery.

Often, communities can repair their own homes so quickly that they are unaware a permit is even required to begin construction. To help raise awareness among property owner, some recommended distribution methods include:

- Sharing information with local media outlets such as newspapers and radio stations
- Posting information in a prominent location on your community's website
- Posting messages periodically to your community's social media pages
- Printing out fact sheets on the permitting process and providing to emergency management or other community staff who are canvassing neighborhoods for direct distribution to residents
- Keeping copies available in municipal offices for community members

## PERMIT REQUIREMENTS

As soon as possible after the flood, you should contact the Iowa DNR and the FEMA Region VII Office to review regulatory requirements for the repair and reconstruction of flood-damaged structures and to see if there are any new guidance documents or data from claims adjusters.

A **floodplain development permit** is needed for each building where repairs will involve removing, altering, or replacing the roof, walls, siding, wallboard, plaster, insulation, paneling, cabinets, flooring, electrical system, plumbing, heating, or air conditioning. The definition of substantial damage discussed previously applies here.

Your governing board may opt to waive permit fees following a disaster.

You may allow clean up and temporary emergency repairs to proceed without a permit. These include:

- Removing and disposing of damaged contents, carpeting, wallboard, insulation, etc.
- Hosing, scrubbing, or cleaning floors, walls, ductwork, etc.
- Covering holes in roofs or walls and covering windows to protect from weather
- Making the building safe to enter by removing sagging ceilings, shoring up broken foundations, etc.

# 21. Disaster Operations (cont'd)

## DETAILED DAMAGE ASSESSMENTS

During this more detailed review, document needed repairs and the extent of damage to each structure. This may be done with a checklist customized by your jurisdiction, or you may use the Substantial Damage Estimate (SDE) program developed by FEMA. Property owners need to be given the opportunity to appeal a damage assessment, and any system of accurate valuation should be considered since the timely determination of substantially damage is critical in the recovery process.



## HEALTH HAZARDS

Floods bring animal carcasses, garbage, mold, and contaminate water and septic systems

# Contacts & Resources

Because names, offices and phone numbers change, this Ready Reference has listed all contacts in one separate section. This section will be updated periodically.

### *Iowa Department of Natural Resources*

Serves as the primary contact for your community for ordinance administration and National Flood Insurance Program technical guidance.

**Land Quality Bureau – Flood Plain Management & Dam Safety**
Wallace State Office Building
502 E 9th St
Des Moines, IA 50319-0034
Website: http://www.iowadnr.gov/InsideDNR/RegulatoryLand/FloodPlainManagement

### *Additional Information*

**Flood Plain Permits, Dam Safety, Floodplain Mapping and the NFIP:** 515-725-8415

**Sovereign Land Program Coordinator:** 515-281-8967

**Water Quality Certification:** 515-725-0341

**Recreational Boat Docks:** 515-281-5918

**Sand and Gravel Permits:** 515-281-8621

Download DNR permit forms at:

http://www.iowadnr.gov/InsideDNR/RegulatoryLand/FloodPlainManagement/FloodPlainDevPermits.aspx

**For technical assistance on ordinances and the NFIP:**

**Ken Bouma**
**515-783-5811**

**ken.bouma@dnr.iowa.gov**

### *Iowa Homeland Security & Emergency Management*

Iowa Homeland Security & Emergency Management Main Office
7900 Hickman Road
Suite 500
Windsor Heights, IA 50324
Phone: 515-725-3231
Website: https://homelandsecurity.iowa.gov/

### *Iowa State Hazard Mitigation Officer*

Matthew Noble
Recovery Division of Emergency Mgmt.
7900 Hickman Rd Ste 500
Windsor Heights, IA 50324
Phone: 515-321-8528
E-mail: matthew.noble@iowa.gov
Iowa State Extension (post disaster materials)
Website: https://www.extension.iastate.edu/disasterrecovery/

### *Federal Emergency Management Agency*

Federal Emergency Management Agency
Region VII
11224 Holmes Road
Kansas City, MO 64131

**General**
Phone: 816-283-7061
E-mail: FEMARegion7info@fema.dhs.gov

**Technological Hazards**
Thomas Morgan
E-mail: Thomas.Morgan5@fema.dhs.gov

**Exercise Officer**
John Bissen
Phone: 816-812-0589
E-mail: John.Bissen@fema.dhs.gov

### *FEMA Mapping and Insurance Exchange (FMIX)*

Toll free call center for flood map related inquiries
1-877-336-2627

### *FEMA Map Product Orders or Access To Online Products*

For ordering FIRMs, FIS, and FIRM databases:

Federal Emergency Management Agency
FEMA Map Service Center
PO Box 1038
Jessup, MD 20794-1038
Phone: 877-336-2627
E-mail: FEMA-FMIX@fema.dhs.gov
Website: https://msc.fema.gov/portal/home

# Contacts & Resources (cont'd)

### *NFIP Online Resources*

The NFIP regulations can be found on this website:
https://www.fema.gov/flood-insurance/rules-legislation

The NFIP's Community Status Book that lists the current status of every community in the NFIP is found at: https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book

MT-EZ – Application Form for Single Residential Lots or Structure Letter of Map Amendment, LOMA's, is explained in Section 6. It can be downloaded from FEMA's website at: https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-ez

MT-1 – Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill: https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-1

MT-2 – Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision: https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2

FEMA Elevation Certificate is explained in Section 18. It can be downloaded from FEMA's website at https://www.fema.gov/pdf/library/elvcert.pdf

FEMA Floodproofing Certificate is explained in Section 18. It can be downloaded from FEMA's website at https://www.fema.gov/sites/default/files/documents/fema_form-ff-206-fy22-153.pdf

### *Hardcopy Forms and Publications*

LOMC Clearinghouse
3601 Eisenhower Avenue, Suite 500
Alexandria, VA 22304
FEMA Publications Warehouse:
1-800-480-2520
Orders can be faxed to: 240-699-0525

### *FEMA's National Disaster & Emergency Management University*

For NFIP related training:
Phone: 301-447-1000
Website: https://training.fema.gov/ndemu/schools/emergency-management-institute/

### *Community Rating System*

ISO/CRS Specialist for Iowa
Marilyn Sucoe
E-mail: nfipcrs@iso.com
Website: https://crsresources.org/100-2/

### *U.S. Army Corps of Engineers*

**Omaha District** (Corps permits for the Missouri River, its contiguous wetlands, and Carter Lake)
US Army Engineer District
Omaha Corps of Engineers
1616 Capitol Ave, Ste 9000
Omaha, NE 68102
Phone: 888-835-5971

**Rock Island District** (Corps permits for all other areas of Iowa)
US Army Engineer District
Rock Island Corps of Engineers
1500 Rock Island Ave
Rock Island, IL 61201
Phone: 309-794-4200
Website: https://www.mvr.usace.army.mil/
Association of State Floodplain Managers

### *ASFPM*

8301 Excelsior Dr
Madison, WI 53717
Phone: 608-828-3000
Website: http://www.floods.org

### *IFSMA*

Iowa Chapter of ASFPM
Iowa Floodplain and Stormwater Management Association
Website: https://www.iowafloods.org/

### *Repair Contractor Certification Programs*

International Institute for Cleaning and Restoration Certification
4043 South Eastern Avenue
Las Vegas, NV 89119
Phone: 844-464-4272
Restoration Industry Association
1120 Route 73, Ste 200
Mount Laurel, NJ 08054
Phone: 856-439-9222