



State of Illinois
Illinois Department of Natural Resources

FLOODPLAIN MANAGEMENT

In Northeastern Illinois



**ILLINOIS DEPARTMENT OF NATURAL RESOURCES
OFFICE OF WATER RESOURCES
LOCAL FLOODPLAIN ADMINISTRATOR'S
MANUAL
August 2012 EDITION**

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NORTHEASTERN ILLINOIS LOCAL FLOODPLAIN ADMINISTRATOR'S MANUAL

Introduction

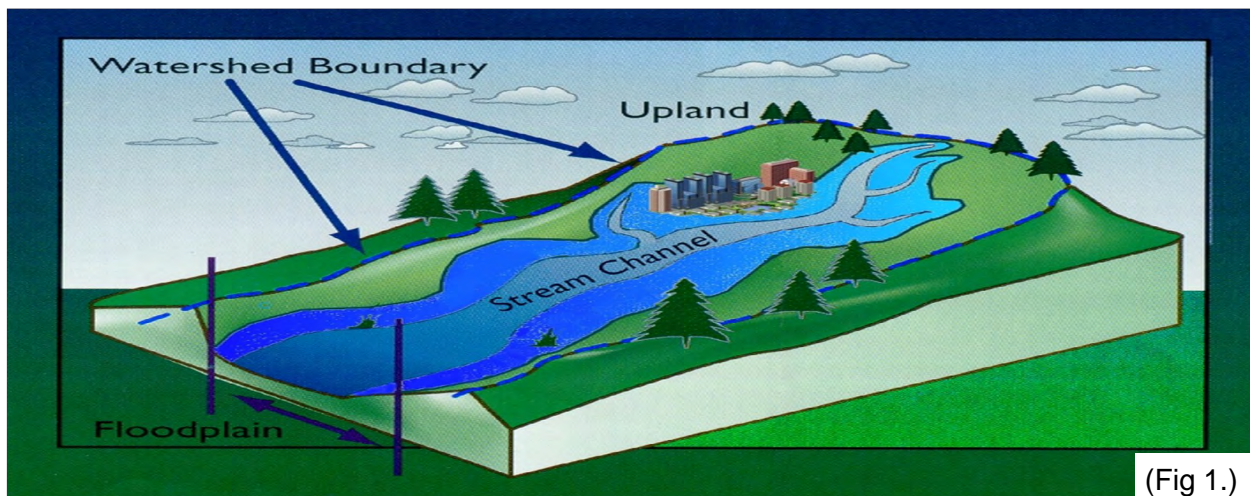
NE Illinois consists of the six county area of Cook, DuPage Kane, Lake, McHenry and Will Counties. Nearly 65% of Illinois' total population lives in the six-county area. The six county area also has a large system of rivers, streams, and lakes. Mapped floodplain areas account for almost 10% of the total land area in the six county area. This combination of a large population and a large flood hazard result in annual flooding in the six county area. Floodplain management has become a primary consideration in planning and development of the area.

Rivers and streams are part of nature's system for carrying water from high ground down to lakes and oceans. The land areas adjacent to the

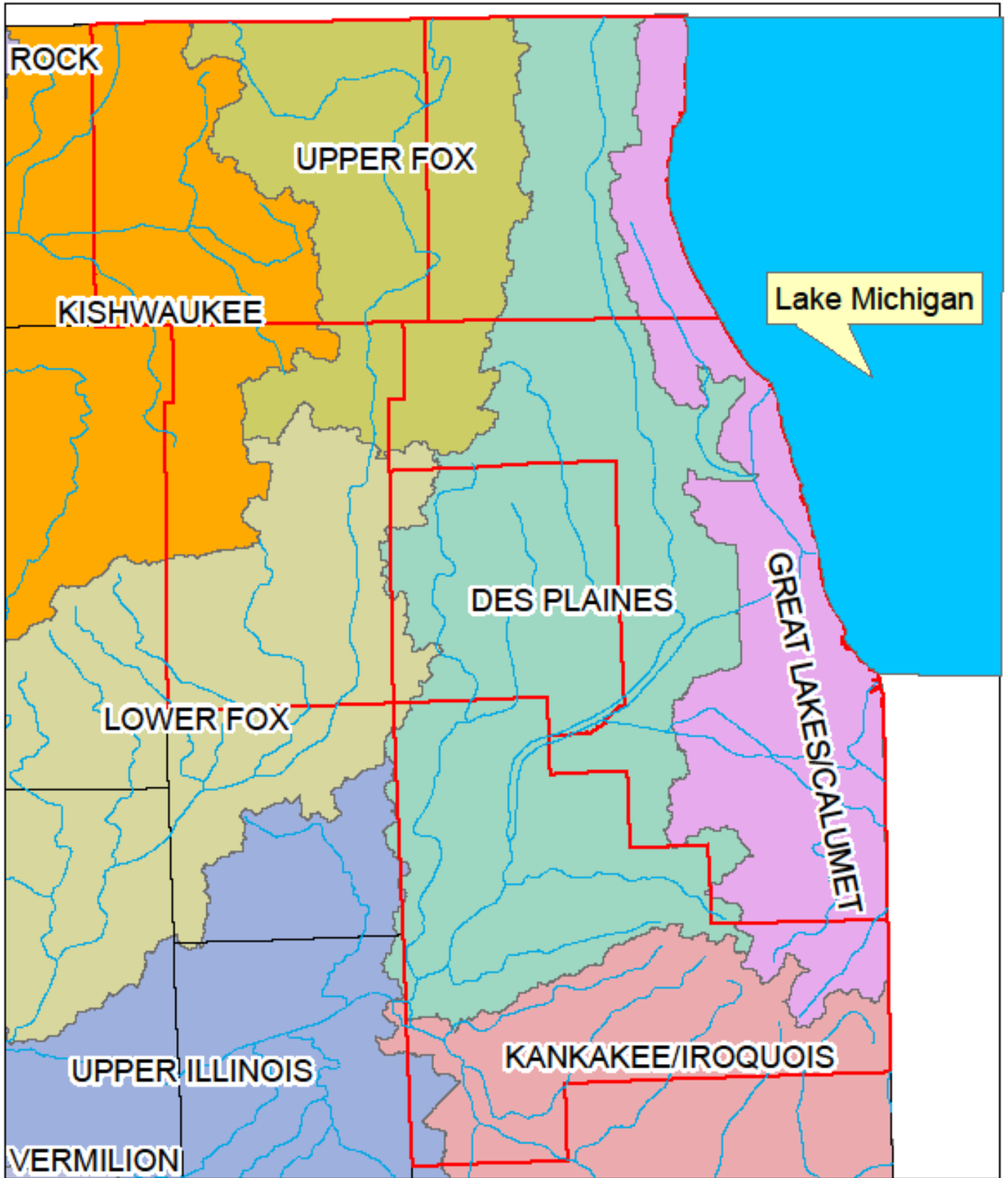


streams, rivers, and lakes that are inundated when flooding occurs are floodplains. Flooding is a natural process and floodplains are a vital part of that process.

A watershed is an area that drains into a lake, stream, or other body of water. Other names for it are basin or catchment area. Watersheds vary in size, and larger ones can be divided into sub-watersheds (Fig 1.)



(Fig 1.)



Office of
Water Resources
August 2012

Northeastern Illinois Watershed Map



(Fig 2.)

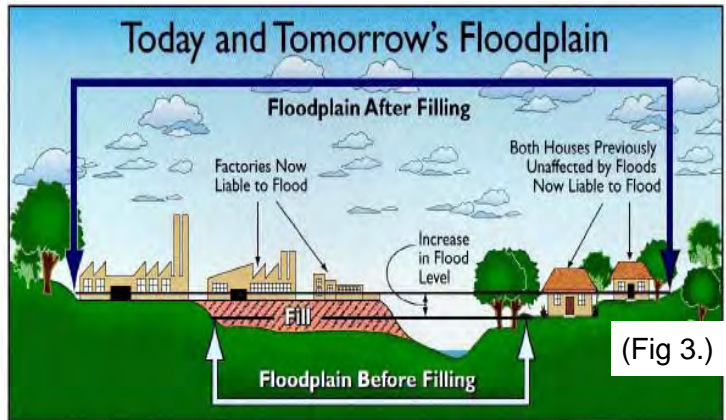
Figure 2 shows the primary watersheds in Northeastern (NE) Illinois. The boundary of a watershed is a ridge or a divide. Water from rain and snowmelt are collected by the smaller channels (tributaries), which send the water to larger ones and eventually to the lowest body of water in the watershed (main channel).

A flood occurs when heavy rains or snowmelt send more water downstream than the carrying channel can handle. There are three primary types of flooding in Illinois:

1. Riverine Flooding - A flood typically seen as water flowing over a stream's banks.
2. Ponding - A flood occurring when low areas fill up faster than they can be drained.
3. Sheet Flooding - A flood when water flows along the surface without a channel.

Occasionally, floods can also be caused by large ice jams or logs forming dams which block normal water flow. In urbanized areas, poor local drainage or sewer problems, for example, can cause basement flooding.

As NE Illinois developed, the state's waterways often served as the focal point for growth and commerce. The waterways provided needed water resources and transportation corridors. Historically, development occurred along these water corridors. Under natural, undeveloped conditions, flooding causes little or no damage. Over the years, insufficient regard has been given to preserving the natural flood storage and conveyance capacities provided by floodplains. Homes, buildings, businesses, and even entire communities now occupy floodplains across NE Illinois. This floodplain development has resulted in continual and, often, severe damage as well as loss of life (**Fig. 3**). In NE Illinois floods are by far the



If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters. This means your home or business may be impacted.

most common natural disaster, accounting for well over 90% of the area's declared disasters. Annual flood damages in the state average nearly \$700 million dollars. Floodplain areas in NE Illinois are documented areas of hazard. Unwise floodplain development further increases property damage and potential loss of life from flooding. The purpose of this manual is to assist local floodplain managers in their efforts to reverse this trend. The manual explains the floodplain regulation requirements in the six county area of NE Illinois and the National Flood Insurance Program (NFIP).

Assistance in enacting and administering floodplain regulations is available from the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR), and the Federal Emergency Management Agency (FEMA). Requests for assistance should be addressed to:

Illinois Department of Natural Resources
Office of Water Resources
2050 West Stearns Road
Bartlett, IL 60103 847-608-3100

Federal Emergency Management Agency
Region V
536 South Clark Street
Chicago, IL. 60605 (312) 408-5500

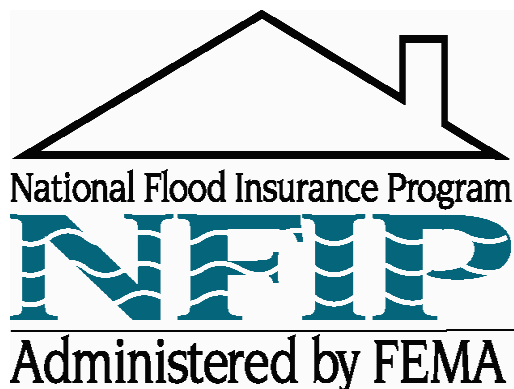
CHAPTER 1

The National Flood Insurance Program

BACKGROUND

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to slow ever rising disaster relief costs and reduce the loss of life and property caused by flooding. The Program has four goals:

- 1) to make flood insurance available to the general public;
- 2) to require that new buildings be constructed to resist flood damages;
- 3) to guide future development away from flood hazard areas; and
- 4) to transfer the costs of flood losses from the taxpayer to floodplain property owners through flood insurance premiums.



The NFIP is a voluntary program based on a mutual agreement between the Federal government and the local community. The

NFIP is administered by the Federal Insurance Administration (FIA) within the Federal Emergency Management Agency (FEMA). The Illinois Department of Natural Resources/ Office of Water Resources (IDNR/OWR) is the state coordinating agency for the NFIP.

Floodplain Management Quick History

Pre-1968

- Main Focus on flood control structures
- Limited availability of private sector flood insurance

Flood Insurance Act of 1968

- Establish National Flood Insurance Program
- Make available federal flood insurance
- Map flood hazard risk zones
- Require LOCAL floodplain management and enforcement

Flood Disaster Protection Act of 1973

- Require mandatory purchase of flood insurance for all federally guaranteed loans and grants
- Reduce taxpayer support to pay flood claims

National Flood Insurance Reform Act of 1994

- Improve compliance with fines to banks which do not require the purchase of flood insurance
- Create Flood Mitigation Assistance Programs
- Increase flood insurance coverage's
- Establish the Community Rating System

National Flood Insurance Reauthorization 2012 (INSERT FROM EMAIL SUMMARY TO ARLAN)

Move flood insurance premiums to actuarial rates

The premise of the NFIP is very simple: Flood insurance, and certain types of state and federal financial assistance such as mortgage loans and community grants, are only available in those communities that adopt and enforce a floodplain management ordinance that meets or exceeds the minimum standards of the program.

These same standards must also be adhered to by all state and federal agencies. The state of Illinois has adopted an Executive Order which requires state compliance with NFIP minimum standards.

The NFIP's regulations are intended to prevent the loss of life and property, and reduce economic and social hardships resulting from flood disasters. There is clear evidence that these goals have been achieved in areas where buildings and other development activities are in compliance with the community's floodplain management ordinance.

Flood insurance is only available in communities that participate in the NFIP. Flood insurance premiums for new buildings are based on flood risk, which is determined by the elevation of the lowest floor of the structure relative to the elevation of the base flood.

In Illinois, over 851 communities and 89 of Illinois' 102 counties participate in the NFIP. Nationwide, nearly 20,000 communities participate in the NFIP. Over 58,000 flood insurance policies are in force with a total coverage in excess of \$10 billion.

PROGRAM ENTRY

There are two very distinct phases of community entry and participation in the NFIP.

Emergency Phase

The "Emergency Phase" is normally the entry stage of participation. In the Emergency Phase, the community is provided with a very simple floodplain map based on very limited data. Where no clear flood risks are present, an Emergency Phase community may be required to pass only minimum floodplain development regulations. In the Emergency Phase, insurance is made available at a flat rate based only on the type of structure, regardless of the structure's location. Very few Emergency Phase communities remain in Illinois.

Regular Phase

To continue in the NFIP, a community is expected to enforce a more comprehensive floodplain construction ordinance which includes the requirement that new buildings in floodplains have the lowest floor, including basement, elevated to or above the base flood elevation. In addition, all other development activities must not alter or divert flood flows onto neighboring properties. Nearly all communities in Illinois are now in this "Regular Phase" of the NFIP. In most cases the community is given a Flood Insurance Rate Map and a Flood Insurance Study which provides detailed information of local flood hazards. When a community joins the Regular Phase of the NFIP, additional amounts of flood insurance become available. Any buildings which existed prior to the community's entry into the NFIP qualify for

government subsidized insurance rates. However, on newer structures, the premiums for this flood insurance reflect the actual flood risk present at the site (actuarial rates). Flood premiums are based on how high or how low a structure is in relation to the flood elevation.

FLOOD INSURANCE

Insurable Losses

A National Flood Insurance Program “Standard Insurance Policy” covers direct loss caused by a flood (less the deductible). A flood is defined as a “general and temporary condition of partial or complete inundation of normally dry land area from the overflow of a lake, river, stream, ditch, etc. or the unusual and rapid accumulation or runoff of surface waters.” In specific instances, and when associated with proximate flooding, flood insurance will also cover damages caused by high ground water, sewer backup, or subsurface flows.

Insurable Property

Any walled and roofed building in a community participating in the National Flood Insurance Program can be insured, whether or not it is in a floodplain. A manufactured home affixed to a permanent site and anchored can also be insured. Two types of coverage are available for insurable buildings:

1. Structural coverage on the walls, floors, insulation, furnace, and other items permanently attached to the structure; and
2. Coverage on the building’s contents (this may be purchased separately from structural coverage).

Uninsurable Property

Property located outside an insurable building, vehicles, trailers on wheels, boats, animals, crops in the field, money, valuable papers, fences, outdoor swimming pools, bridges, driveways, docks, land values, plants, landscaping, and finished portions of a basement cannot be insured with a standard NFIP policy.

Basement Coverage

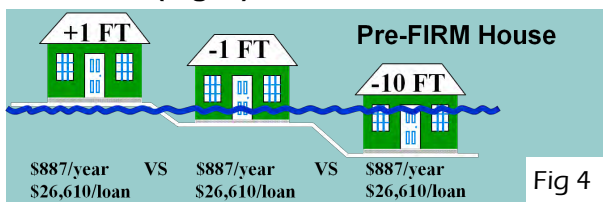
Typically, National Flood Insurance insures against damages caused only by surface flooding. It will not cover damages from seepage or sewer backup unless there is a general and temporary condition of flooding in the area and flooding is the proximate cause of the seepage. National Flood Insurance does not cover finished portions of a basement such as carpeting and paneling. Unimproved structural parts such as the foundation, walls, stairway, and utility connections are covered. It will also cover unimproved (not taped or painted) drywall and insulation. The following items are also covered as part of structural coverage: sump pumps, water tanks, oil tanks, furnaces, water heaters, heat pumps, electric junction and circuit breaker boxes, clothes washers and dryers, food freezers, air conditioners, and clean-up. Many private insurance carriers sell coverage for basement sewer backup or sump pump failure. Typically this coverage is added on to an existing homeowner’s policy (“a rider”). This covers water damage to a building and basement contents when the sewer lines backup or the sump pump fails (not associated with nearby flooding). These are commercial flood policies and details will vary from company to company.

Flood Insurance Rates

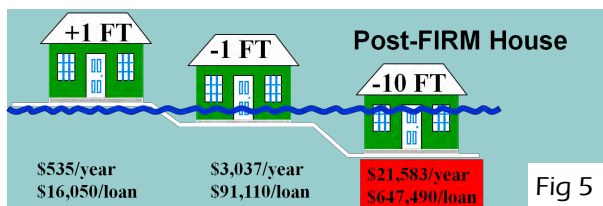
The relationship of a building's lowest floor (including basement) to the base flood elevation (BFE) can have a significant impact on flood insurance rates.

Rates are subsidized for older existing buildings that were built before a community obtained floodplain maps and joined the NFIP. These types of buildings are called pre-FIRM (pre-Flood Insurance Rate Map) structures (Fig 4.)

Rates for buildings constructed after the community obtained flood insurance rate maps and joined the NFIP (post-FIRM construction) are actuarial, that is, they vary from building to building depending on the elevation of the building's lowest floor (including basement) in relation to the base flood level (Fig 5.)



Based On:
2-Story Single Family Dwelling, No Basement, Pre-FIRM Construction, Regular Program, Located In An AE-Zone, \$75,000 Building Coverage



Based On:
2-Story Single Family Dwelling, No Basement, Post-FIRM Construction, Regular Program, Located In An AE-Zone, \$75,000 Building Coverage

Typical flood insurance premiums in Illinois are less than \$700. However, newer buildings which are not constructed in accordance with the community's flood protection ordinance (ie not elevated), can have rates well over \$1,000.00. Premiums are lowest if the building is located outside a floodplain. Special policies called (preferred rate policies) are available for structures located outside the floodplain.

Proper enforcement of the floodplain ordinance and community participation in the Community Rating System can have a profound effect on flood insurance rates.

Mandatory Purchase Requirements

Purchase of flood insurance is voluntary except where a person receives federal aid, a mortgage, or other loan for a flood-prone property. Federal law requires flood insurance for all federal assistance and loans to construct, improve, or purchase structures located in floodplain areas. In these cases, it is the lender's responsibility to make flood zone determinations for insurance purposes. Most lenders hire a third party "zone determination company" to provide this service for them. In most cases, lenders require structural coverage equal to the amount of the loan or the minimum amount available, whichever is less. However, some lending agencies may have stricter requirements in their own regulations.



ICC BEFORE AND AFTER

INCREASED COST OF COMPLIANCE (ICC)

When a building covered by a standard flood insurance policy sustains a substantial loss caused by a flood, it may be eligible for up to \$30,000 to:

Floodproof,
Relocate,
Elevate, or
Demolish (F.R.E.D.) the building.

The intent of ICC is to eventually reduce the number of structures which are repetitively flooded.

A building is eligible for ICC claim payment if:

1. it is in a floodplain,
2. has a flood insurance policy in effect, and
3. the community determines it has been substantially damaged (see page 44).

Most communities in Illinois have also adopted local regulations to track cumulative losses on buildings which are repetitively flooded. When multiple losses on a structure add up to 50% damage, an ICC claim payment would be eligible. ICC has become one of the most effective tools for many communities in the state to reduce their exposure to repetitive flood damages.

COMMUNITY ASSISTANCE PROGRAM

The state coordinating agency for the NFIP, the Office of Water Resources; conducts scheduled visits with NFIP participating communities. Most communities will be visited at least once every five years. Communities experiencing rapid growth, development pressures or problems are visited more frequently.

The visits are made to document floodplain development activities and to evaluate how communities are coping in their efforts to regulate floodplain development according to the NFIP. The primary purpose of these visits are to assist communities in identifying and solving floodplain management problems.

During the visit, any problems in procedures or enforcement of the local ordinance are identified and appropriate corrective actions are discussed. When noncompliance with the local ordinance or NFIP regulations is identified, the community is expected to take actions necessary to remedy the infractions.

Enforcement action against a community can be initiated if a community refuses to address noted deficiencies. However, before such action is taken, the state will make every effort to work with the community and resolve any outstanding compliance issues. Failure to resolve issues can result in suspension from the NFIP.

EFFECTS OF SUSPENSION OR NON-PARTICIPATION IN THE NFIP

Non-participation or suspension from the NFIP is rare, but can subject the community to the following consequences:

1. Flood insurance will no longer be available. No resident will be able to purchase a flood insurance policy;
2. No federal grants or loans for buildings may be made in identified flood hazard areas. This restriction includes all Federal agencies such as Housing and Urban Development, Emergency Services Disaster Agency, Small Business Administration, etc;
3. No federal disaster assistance may be provided in identified flood hazard areas;
4. No federal mortgage insurance may be provided in identified flood hazard areas. This includes Federal Housing Authority, Veterans Administration, and Farmers Home Administration;
5. Several types of state grants and loans (such as IDNR, Department of Commerce & Community Affairs, Department of Transportation, Environmental Protection Agency, Department of Public Health, etc..) may not be available; and
6. Local governing bodies may be susceptible to some form of liability by not participating because their action:
 - 1) denies the ability of its citizens to purchase flood and related water damage insurance; and 2) does not take positive steps to reduce the exposure of life and property in the face of authoritative scientific and technical data.

Once a community is suspended, it must resolve the outstanding violations before it may re-enter the program.

NFIP QUICK REFERENCE GUIDE

There are four types of communities for NFIP purposes. They are shown below with some of their characteristics and actions necessary to be taken by local officials, lending institutes, and insurance agents.

1) MAPPED AND PARTICIPATING

- **Community Actions:** Require state and local permits for new development in floodplains. Require new development to comply with the state and local floodplain regulations.
- **Flood Insurance:** Available throughout the community (inside or outside the floodplain).
- **Lender Actions:** Require flood insurance on all loans in the floodplain. Give notice about flood hazards and federal disaster assistance availability.

2) MAPPED AND NOT PARTICIPATING

- **Community Actions:** Local floodplain permits not required but state and federal permits still apply in floodplain.
- **Flood insurance:** Not available.
- **Lender Actions:** Federally-assisted loans prohibited in the floodplain. Conventional loans permitted at lender risk. Give notice about flood hazards and unavailability of federal disaster assistance.

3) NOT MAPPED AND PARTICIPATING

- **Community Actions:** Regulate new construction to avoid flood damage to the extent known. Minimal regulations apply.
- **Flood Insurance:** Available throughout the community.
- **Lender Actions:** No specific requirements; flood insurance available but not required.

4) NOT MAPPED AND NOT PARTICIPATING

- **Community Action:** None required.
- **Flood Insurance:** Not available.
- **Lender Actions:** No specific requirements.

Chapter 2 Floodplain Data And Mapping

NOTE: At the time of printing, each county in Northeastern Illinois has (or soon will have) digital countywide floodplain maps. The guidance in this manual is done with the assumption that each county has digital Countywide Flood Insurance Rate Maps (DFIRMS).

THE BASE FLOOD

The base flood is the National Flood Insurance Program (NFIP) and the State of Illinois' designated flood for regulation purposes. By definition, the base flood has a 1% or 1 out of 100 chance of occurring in **any given year**. If we had flood gage records over a long period of time (say, several thousand years) we would see that base floods occur on the average about once every 100 years. Because of this statistical probability, the base flood is also called the 1% chance or the 100-year flood.

Using the base flood concept allows all communities to regulate to the same standard. Although a 100-year flood sounds remote, it must be kept in mind that the base flood hazard is present every year. A base flood can, and has on several occasions in recent years, occurred more than once in the same year. During the life of an average 30 year mortgage, a home located within the 100-year floodplain has nearly a 30% chance of being damaged from a base flood during the life of that mortgage. The same home has less than a 1% chance of fire damage during the same period.

BASE FLOOD ELEVATION (BFE)

The BFE is the elevation (normally in feet above sea level) which the base flood is expected to reach. Base flood elevations have been determined on many of the streams and rivers in Illinois. Floodplain maps show the boundaries of the base flood. However, the accuracy of those boundaries is only as good as the original map used to develop the floodplain map. For example, if the base flood elevation is 496 feet above sea level and the original topographic map used to develop the floodplain map had a 10 foot contour interval, it is obvious that judgment was used to locate the approximate floodplain boundary between the 490 and 500 foot contour lines. When mapping a floodplain, better ground topography always results in more accurate floodplain delineations.

THE FLOODPLAIN or "SPECIAL FLOOD HAZARD AREA" (SFHA)

Although commonly called "the floodplain", for purposes of the NFIP, the area that would be inundated by the base flood is called a "special flood hazard area" (SFHA). The floodplain area (SFHA) is normally shown as a gray shaded area on a community's floodplain map.

Is a Property In or Out of the Floodplain?

Because of the inherent inaccuracy of all maps, the floodplain maps are best used only to generally identify which properties are located in the floodplain and, therefore, subject to floodplain regulations. Communities are encouraged to plot the floodplain boundaries on more detailed topographic maps or on the community's Geographic

Information System (GIS) if they are available. If you are not sure if a property is in or out of the floodplain, you must rely on the actual property elevation. For example, if a development site appears to be located in the floodplain on the floodplain map, but a ground survey of the property shows the natural ground elevation to be above the base flood elevation, then the development is, in fact, not in the floodplain and, therefore, not subject to floodplain development regulations. Conversely, if the site is located close to but outside of the shaded floodplain area on the map, but ground elevations show the site to be below the base flood elevation, then development at the site is subject to the regulations. This is why the floodplain is defined in most ordinances as that area “generally” identified on the floodplain map.

Accurate site elevations always take precedence over the maps. However, if a building is located within the floodplain on a map and more accurate ground surveys show otherwise, formal map revision procedures called a Letter of Map Amendment (LOMA) must be undertaken in order to remove the site from the floodplain and release the building from the insurance requirements of the NFIP (see page 17).

The Floodway

The floodway is typically the channel of a river or stream and the overbank areas adjacent to the channel. During a flood event, the floodway carries the bulk of the flood waters downstream and is the area where water velocities and forces are the greatest and most destructive. State regulations require that the floodway be kept open so that flood flows are not obstructed or diverted onto other properties (Fig. 6).

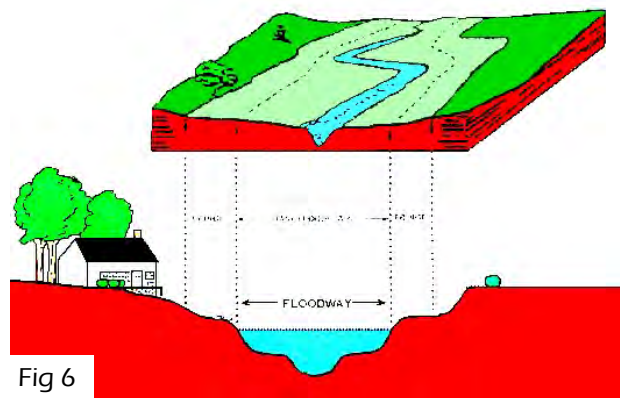
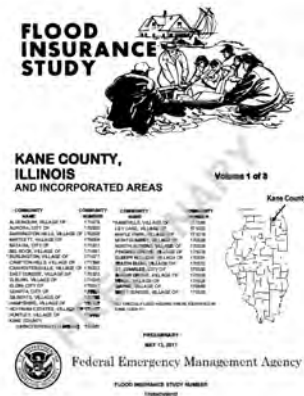
In NE Illinois only certain uses of the floodway are allowed. These “Appropriate Uses” are discussed in more detail in Chapter 4. A state permit is required for all but minor floodway development activities (see Chapter 3). NOTE: Where no floodway has been delineated, state permit review is required for any development activities proposed within the entire mapped floodplain area.

The Flood Fringe

The area on either side of the floodway is called the flood fringe. This area is subject to inundation from the base flood but conveys little or no flow. No state permit is required for development in the flood fringe. However, local floodplain permit rules still must be enforced in the fringe areas.

FLOOD INSURANCE STUDY (FIS)

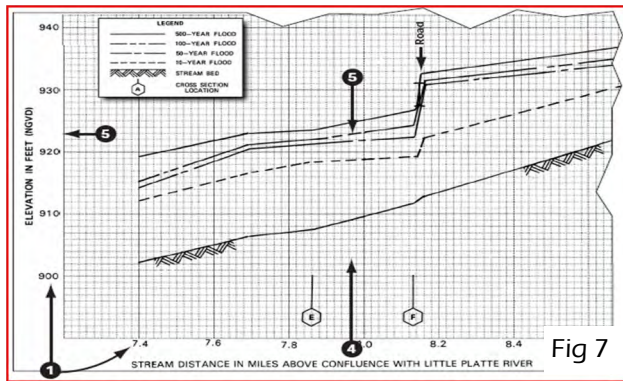
The Flood Insurance Study (FIS) is prepared by FEMA to summarize and explain the flood hazard present in the community. In NE Illinois, each county



has their own unique FIS. Each community within that county is also referenced in the FIS. When prepared, the FIS provides accurate and detailed flood hazard information which can assist the local administrator in regulating floodplain development. FIS information includes a written report containing a description of a community's flooding conditions, flood profiles showing 500, 100, 50, and 10-year flood elevations for each stream reach studied in detail, and data concerning the different characteristics of the floodway calculated for cross sections taken along the stream.

The Flood Profile

The flood profile (Fig 7), which is included in the Flood Insurance Study can be used to determine more exact base flood elevations for any specific site within a floodplain. Where an FIS has been produced the flood profile will take precedence over the floodplain map for determining exact Base Flood Elevations.



The Floodway Data Table

Where detailed mapping has been completed, a FIS will often include a Floodway Data Table (Fig 8). The Floodway Data Table shows detailed information about flooding characteristics at surveyed cross-sections of a stream. The floodway data table will provide

the floodway width, the stream discharge, and the base flood elevation at each cross section.

FLOODPLAIN MAPS

Floodplain maps vary in detail dependent on several factors including availability of topographic base maps, flood gage data, development potential in the floodplain, and the amount of flood hazard present. Floodplain maps are the basis for implementing floodplain management regulations. Nearly all communities with any potential flood hazard have, jointly with FEMA and the State, produced a floodplain map upon entry into the program.

Floodplain maps for most rural or minimally developed areas in the state lack any detailed engineering. These maps show only approximate estimations of where flooding is most likely to occur. Conversely, floodplain maps for urbanized areas or areas where flood damages occur more frequently are studied and mapped in detail.

NOTE: At the time of this handbook's publication, each county in NE Illinois has (or soon will have) digital countywide floodplain

CROSS SECTION	DISTANCE	FLOODWAY			PERCENT ANNUAL CHANGE IN FLOOD WATER SURFACE ELEVATION (FEET/ANNUAL)			
		WIDTH (FEET)	AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATED	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
AA	255,620 ⁺	293	3,859	5.0	628.3	678.3	628.4	0.1
AB	288,100 ⁺	303	3,910	5.2	628.5	628.5	628.6	0.1
AC	258,910 ⁺	368	3,914	4.8	628.6	628.8	628.9	0.1
AD	250,520 ⁺	483	5,570	3.3	629.0	629.0	629.1	0.1
AE	286,730 ⁺	384	1,742	5.4	629.0	629.2	629.3	0.1
AF	257,250 ⁺	81	1,633	5.6	629.2	629.2	629.3	0.1
AG	237,780 ⁺	168	1,750	5.4	629.6	629.6	629.7	0.1
AH	261,910 ⁺	134	1,596	6.8	629.7	629.7	629.8	0.1
AI	284,200 ⁺	185	2,550	3.6	634.8	634.8	634.8	0.0
AJ	258,630 ⁺	876	9,315	2.8	635.0	635.0	635.0	0.0
AK	258,100 ⁺	549	8,488	2.9	635.0	635.0	635.0	0.0
AL	280,100 ⁺	723	3,967	2.7	635.2	635.2	635.2	0.0
AM	262,010 ⁺	943	7,253	2.0	635.5	635.5	635.5	0.0
AN	252,730 ⁺	730	6,055	2.8	635.7	635.7	635.7	0.0
AO	263,140 ⁺	710	6,953	2.5	635.8	635.8	635.8	0.0
AP	273,135 ⁺	937	4,485	3.2	640.7	640.7	640.7	0.0
AQ	273,288 ⁺	578	3,958	3.6	642.0	642.0	642.1	0.1
AR	274,972 ⁺	384	3,425	4.8	642.2	642.2	642.3	0.1
AS	275,503 ⁺	258	2,897	6.8	642.4	642.4	642.5	0.1
AT	277,380 ⁺	889	5,874	2.5	645.0	645.0	645.1	0.1
AU	277,880 ⁺	897	6,525	2.2	653.9	653.9	654.0	0.1
AV	276,251 ⁺	734	6,165	2.3	651.0	651.0	651.1	0.1
AW	274,888 ⁺	706	5,689	2.6	651.1	651.1	651.2	0.1
AX	262,781 ⁺	718	4,183	3.2	651.6	651.6	651.7	0.1
AY	268,885 ⁺	610	4,424	3.0	652.7	652.7	652.8	0.1
AZ	288,816 ⁺	472	2,373	5.7	653.3	653.3	653.4	0.1

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY
KANE COUNTY, IL
AND INCORPORATED AREAS

FLOODWAY DATA
FOX RIVER

Fig 8

maps. The guidance in this manual is done with the assumption that each county has digital countywide Flood Insurance Rate Maps.

Flood Hazard Boundary Map (FHBM)

Historically, when a community first joined the NFIP, it was given an Flood Hazard Boundary Map (FHBM) (Fig. 9). This is a very simple map which only shows where the floodplains are most likely located based on very basic data. FHBMs do not include base flood

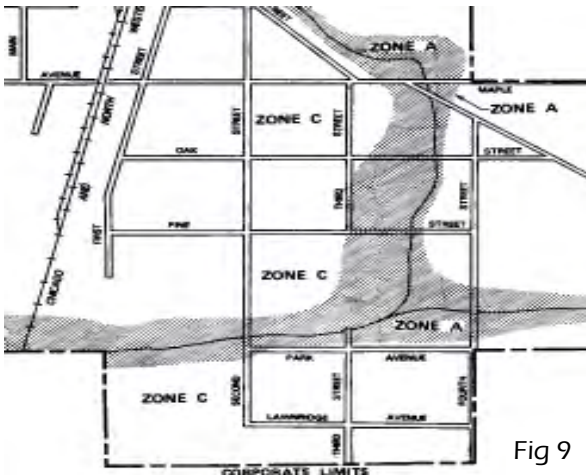


Fig 9

elevations and are not based on detailed studies. If development activities in that community are relatively minimal, the FHBM will most likely be the only map ever issued to a community. Therefore, some rural counties and smaller communities in downstate Illinois may still have FHBMs as their regulatory maps.

In NE Illinois, all existing Flood Hazard Boundary Maps have now been converted to digital Flood Insurance Rate Maps. Producing a detailed engineering flood study can be very expensive and must be justified by the flood risk and development potential. Therefore, in most situations, these unstudied stream with minimal development potential will

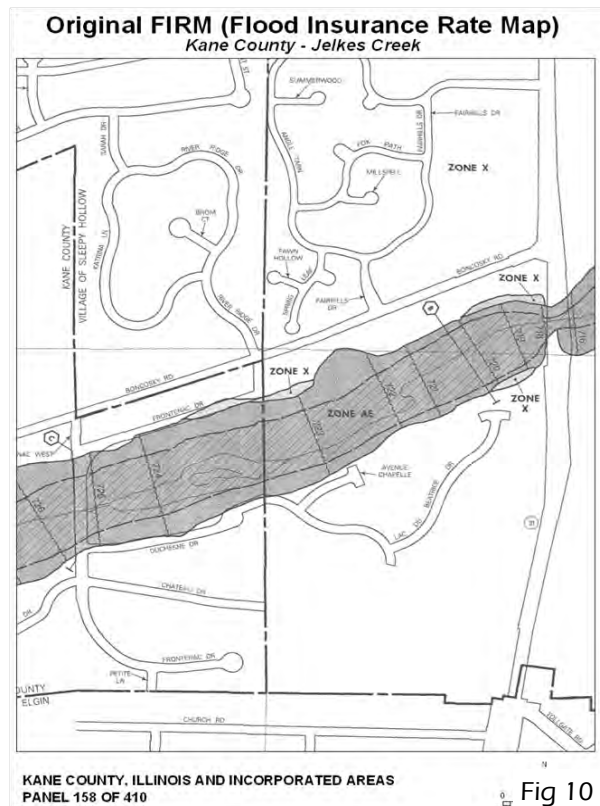
remain unstudied on the new digital flood products unless a community has completed it's own detailed flood study and more accurately identified the floodplain area.

When development is proposed in a floodplain area identified on the FHBM it is up to the developer to provide base flood elevations, obtain the proper state and federal permits, and show that any buildings will be protected from the base flood. The calculation of a base flood elevation will normally require the services of a professional engineer.

Figure 9. Flood Hazard Boundary MAP

Flood Insurance Rate Map (FIRM)

The Flood Insurance Rate Map (FIRM) is the map that most Illinois communities receive after conversion into the regular phase of the NFIP (Fig 10). Unlike the FHBM, FIRMs generally include flood elevations and are



based on a detailed study. Floodplain areas are generally shown as “Zone A1-A30” or “Zone AE” on the FIRM. With the FIRM, flood elevations at any specific development site within the community can generally be determined. Occasionally, a community will have a FIRM which does not include base flood elevations. When this happens, it is up to the developer to provide the base flood elevation, obtain the proper state and federal permits, and show that any buildings will be protected from the base flood.

The most recent digital maps being printed by FEMA are still called Flood Insurance Rate Maps (FIRMs) but they include both base flood elevations and identified floodways. The new generation of digital FIRMs may also include studied and unstudied streams.

Flood Boundary and Floodway Map

Many streams in NE Illinois have been studied in detail to identify and delineate the floodway. Historically, these floodways were shown on a separate map called a Flood Boundary and Floodway Map. These old Flood Boundary and Floodway Maps have now been replaced and the floodway data is incorporated onto the digital countywide Flood Insurance Rate Maps. The floodway on these new maps is identified by a cross-hatched area on either side of the channel (**Fig 11**). All new mapping is being done by this method. The new maps make regulating much easier for the community since all of the necessary data is found on one map rather than several.

Countywide Flood Insurance Rate Map

Countywide Flood Insurance Rate Maps (FIRMs) show flood hazard information for all geographic areas of a county, including incorporated cities and villages as well as rural areas. Previously, maps were prepared for each jurisdiction. The new countywide maps are not limited by political boundaries. These maps make regulating much easier for the community since the maps can be used as community grows and municipal boundaries change. All of the necessary data is found on one map rather than several. All new FIRMs are being produced in a digital countywide format. Eventually, these new countywide FIRMs will provide complete statewide coverage.

Digital Flood Insurance Rate Maps (DFIRM)

All new floodplain maps are being produced digitally. This means that all the data used to

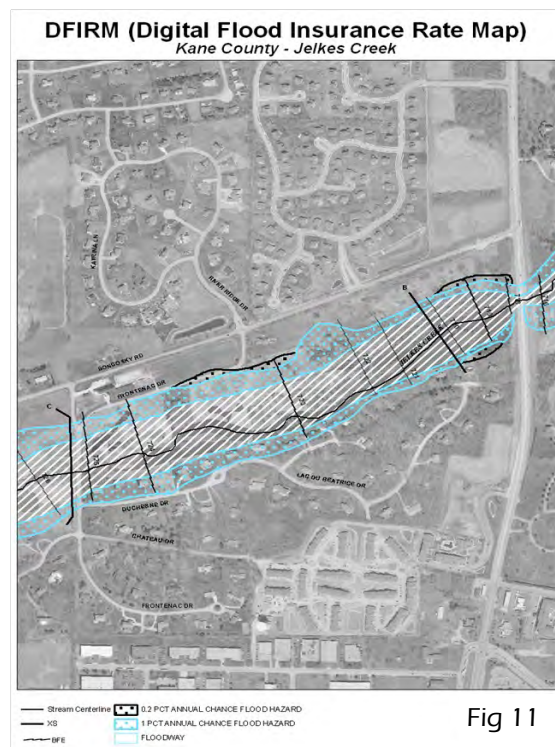


Fig 11

create a hardcopy floodplain map is now stored on computer files. This includes base map information, graphics, text, shading and other geographic and graphic data. The DFIRM is generally produced in a countywide format, where all flood hazards for the county

EXPLANATION OF FLOODPLAIN ZONES

Zone Description

“A” The Base Flood Elevations (BFEs) have not been determined. The lowest floor elevation is required (must be provided by the applicant).

“AE or A1-A30” The Base Flood Elevations (BFEs) are provided. The lowest floor elevation is required.

“AE” Designation for A1-A30 zones found on newer maps. The lowest floor elevation is required.

“AH” Shallow water depths (ponding) between one and three feet occur. Base flood depths may be provided. The lowest floor elevation is required.

“AO” Shallow water paths (sheet flow) between one and three feet occur. Base flood depths may be provided. The lowest floor elevation is required.

“A99” Where enough progress has been made on protective systems such as dikes, dams, and levees, to consider it complete for insurance rating purposes. No BFEs are provided.

“B” Areas between limits of the 100-year flood and the 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile or where areas protected by levees from the base flood. “B” zones have been replaced by “X” zones on the newer FEMA maps. The lowest floor elevation is not required.

“C” Areas of minimal flooding located outside of both the 100-year and 500-year flood zones. “C” zones have been replaced with “X” zones on newer FEMA maps. No lowest floor elevation required.

“X” Areas determined to be outside of both the 100-year and 500-year flood zones. No lowest floor elevation required.

“D” Areas in which flood hazards have not been determined and is usually very sparsely populated. No lowest floor elevation required.

and incorporated communities are shown on one set of maps.

These maps can be used for floodplain management purposes in a manner similar to other flood maps, but they can also be combined with other digital map information to create layers of new information for planning purposes. The State and FEMA are currently converting all floodplain maps into a digital format. This will greatly aid with the updating of maps and keeping them current (Fig 11).

Area of State Concern Map

In addition to the types of FEMA maps described above, the Office of Water Resources occasionally produces what is called an Area of State Concern Map. This map is prepared only in rare situations where extreme development pressures or recurrent flood damages are taking place along a stream which does not have a floodway map or a detailed study done by FEMA. The Area of State Concern Map identifies an approximate floodway or an area where state permit review should take place prior to local

permit issuance. The Area of State Concern Map assist the local floodplain manager and expedite the local permit process because it identifies the areas where state permit review is required.

THESE ARE YOUR MAPS!

The floodplain maps are produced jointly by FEMA, the State, and the local community. No floodplain map is finalized without community input and approval. Therefore, it is very important that these maps be kept accurate and up-to-date as floodplain risks evolve. As part of the NFIP participation agreement with FEMA, the community is expected to maintain their floodplain maps and keep them accurate. Remember, these are the community's floodplain maps and it is a local responsibility to keep them current and accurate.

COOPERATING TECHNICAL PARTNERS (CTP)

The development of a floodplain map should be a joint effort between FEMA, the State, and the local community.

In an effort to maximize limited funding by combining resources and aligning objectives, FEMA has created a program where local communities, regional agencies, or State agencies become active partners in creating new floodplain maps. Cooperating Technical Partners (CTPs) enter into an agreement with FEMA that formalized their contribution and commitment to new flood mapping. CTPs take advantage of this partnership with FEMA to help ensure their flood maps are accurate, up-to-date, and to most accurately reflect local conditions. More information and guidance on the CTP program can be found at the FEMA website at www.FEMA.gov.

CHANGING FLOODPLAIN MAPS or DATA

Floodplains are not static. Floodplain characteristics can change over time based on land use, watersheds, channels, and engineering. Floodplain mapping is also subject to change as new data becomes available.

From time to time, communities or individuals may find it necessary for floodplain maps or data to be revised. In the majority of cases, rather than reprint an entire map, FEMA will simply issue a letter which revises the existing floodplain map. There are five basic reasons that a map may need to be changed:

1) Revisions to correct an error: If a map contains minor errors (for example, streets or corporate limits are in the wrong location, or corporate limits have changed by annexation), the local government should send FEMA a new community map. If a city or village has several annexations each year that affect the floodplain, a revision request should be submitted only once a year. The new digital floodplain maps will greatly improve the process of updated this type of information.

2) Revisions based on better ground elevation data: If a detailed contour map shows errors in the floodplain boundaries, copies of the more accurate information should be submitted to FEMA. If the base flood elevation is known (or has been more accurately computed since the map was made), it should be included with the submittal. Rapidly evolving Geographic Information Systems and Geographic Positioning Satellite data should help the development of accurate digital floodplain maps

3) Revisions based on authorized filling in the floodplain:

If there has been a substantial amount of new permitted filling in or near the floodplain, a certified “as-built” topographic map should be submitted to FEMA after the project has been completed. Remember, any filling in the floodplain may require both state and local approval.

4) Revisions based on better flood data: A Flood Insurance Rate Map and Flood Insurance Study reflect the best data available on flood risks at the time of publication. Parties challenging this data can do so only if the challenge is based on better or more accurate study techniques. The better data should be submitted to FEMA for a map revision determination.

5) Revisions based on new flood protection: A map may be revised to reflect new flood protection projects built since the map was prepared. Plans for large projects usually include after-project maps that can readily be used to revise a floodplain map. However, in most cases a map cannot be changed until the project is actually constructed and in operation. Furthermore, small projects such as on-site detention or channel improvements typically do not lower the base flood enough to warrant a map revision.

MAP CHANGES

There are several types of map changes. A few of the more common map changes are:

Letter of Map Amendment (LOMA)

Individual structures or parcels of land may occasionally be inadvertently included in the mapped floodplain. A property owner who

believes that a specific structure or parcel of land has been incorrectly shown in the floodplain can obtain elevation data to prove the maps wrong. The Letter of Map Amendment (LOMA) process requires an engineer or surveyors certification that the parcel is located at a natural (no filling) elevation higher than the base flood elevation. **(Fig 12).**

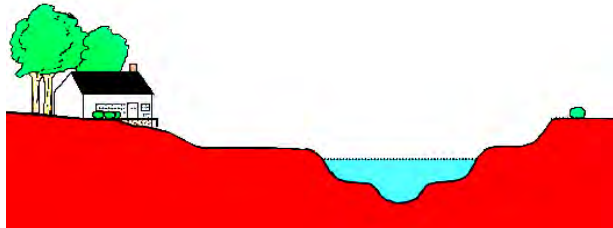


Figure 12. Letter of Map Amendment - Ground is naturally higher than the flood elevation.

Letter of Map Revision (LOMR)

The Letter of Map Revision (LOMR) is applicable when a floodplain areas is physically modified to change flood conditions. A LOMR normally requires revised hydraulic modeling and usually will not involve specific lots, properties, or structures but rather entire reaches of a stream. If the request is approved, FEMA will normally issue a Letter of Map Revision (LOMR). In most NE communities a LOMR must be obtained *before* a permit, which is based on the proposed map, can be issued. Most LOMRs require a processing fee. **(Fig. 13)**

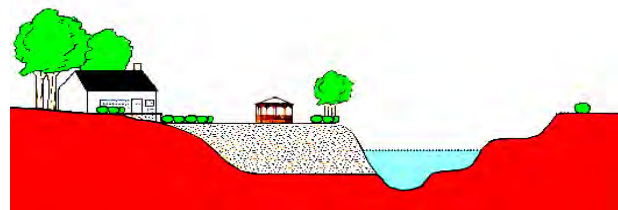


Fig. 13. Letter of Map Revision - Ground has been physically modified to reduce flood risk.

Conditional Letter of Map Revision (CLOMR)

The CLOMR allows for approval of anticipated map revisions based on proposed modifications or conditions that are expected to exist in the future. 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. There is normally a processing fee for a CLOMR.

Letter of Map Revision Based on Fill (LOMR-F)

Flood Insurance Rate Maps can be revised based on the placement of fill. However, new structures in these filled areas with the lowest floor *below* the regulatory flood elevation will *only* be allowed if the community provides assurances that any land or existing or proposed structures are “reasonably safe from flooding” and meet current FEMA floodplain building requirements. These rules will also apply to any future development on these filled parcels.

If a community wants to allow structures with the lowest floor below the regulatory flood elevation in filled floodplains, the community must ensure that buildings are “reasonably safe from flooding”. The criteria for “reasonably safe from flooding” are technically complicated and may be difficult for many communities to administer. communities should also avoid signing any assurance that buildings are “reasonably safe from flooding” with little or no understanding of the potential implications and liabilities

NOTE communities which chooses to take on this responsibility, should adopt language in the local floodplain ordinance that defines a “reasonably safe” area below the base flood elevation. The community must also ensure that all of the “reasonably safe” criteria are met and documented on permit files every time development occurs in any of these LOMR-F areas. A signed community assurance form is then required by FEMA prior to processing the map revision. For these reasons, the State does not encourage the adoption of LOMR-F regulations.

Further guidance can be obtained through the FEMA technical bulletin “Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding” (FEMA Technical Bulletin 10-01). This document can be obtained at: <http://www.fema.gov/mit/techbul.htm>

Information Needed to Request a Map Amendment or Revision

Anyone (local governments or individuals) can request a map change. However, a floodway change does need to be approved by both state and local governments. Information required to support the map change will vary based upon the type of request.

There are three types of FEMA map change application forms:

MT-EZ- This form is used when elevations show that an individual structure or lot is naturally higher than the base flood elevation. There is no charge for this type of map change.

MT-1 - This form is used to support a map change based on fill or revised base flood data. This type of map change typically effects multiple lots or larger geographic areas. There is normally a fee associated with processing this request.

MT-2 - This form is used to support large scale flood control projects or physical modifications to the natural topography of the floodplain. State and local permit approval must be certified as a condition of this type of map revision. There is normally a fee associated with processing this request.

FEMA has detailed guidance on map changes, directions, and downloadable forms available at www.FEMA.gov.

Further information and guidance can also be obtained from IDNR/Water Resources or FEMA Region V.

Information Needed to Request a Floodway Revision A floodway map revision can only be obtained if it is first permitted and approved by a State or local government. Requests to revise a floodway may be initiated through contact with FEMA, but review and approval by IDNR/OWR will generally be required before the revision is final.

FURTHER INFORMATION

It is not practical to fully describe the procedures for changing floodplain map in this manual. FEMA has several publications which describe in detail the instructions for changing floodplain maps. This information can be obtained at www.FEMA.gov.

Chapter 3 Administrative Procedures

DUTIES OF THE LOCAL FLOODPLAIN ADMINISTRATOR

The local permit official is the primary point of contact for administration and enforcement of the floodplain ordinance. The local floodplain administrator is expected to perform the following duties:

- Review and evaluate floodplain development permit applications; determine whether or not the development will take place in the floodplain.
- Interpret floodplain boundaries and provide base flood elevation data where available.
- Review plans and specifications for conformance with the community's floodplain ordinance.
- Advise applicants of other state, federal, or local permit requirements.
- Provide notification of changes to existing watercourses to FEMA and IDNR/OWR.
- Issue or deny floodplain development permits.
- Inspect development in progress to field check development location and to verify that construction proceeds in conformance with approved plans.
- Maintain records of floodplain development, including number of floodplain permits granted, documentation of any variance

actions, and copies of elevation or floodproofing certificates.

- Investigates violations of the floodplain ordinance and take appropriate corrective action.
- Advises community officials and public on matters involving floodplain management regulations.
- Councils permit applicants and local officials on variance criteria.
- Maintain the community floodplain maps and keep them up-to-date and accurate.

THE LOCAL FLOODPLAIN DEVELOPMENT PERMIT

Communities participating in the National Flood Insurance Program (NFIP) must have a floodplain development permit system in place.

Permits are required for all “development” as defined by the NFIP. A step-by-step permitting guide has been prepared by the Illinois Department of Natural Resources, Office of Water Resources (IDNR/ OWR) to assist local floodplain administrators in meeting all federal, state, and local permitting requirements. That guide and flow-chart is found in the appendix of this manual.

THE LOCAL PERMIT APPLICATION

Anyone planning to develop in the floodplain must obtain a permit application from the local building official, fill it out, and submit it, along with the development plans, for approval before beginning any development activity. An effective permit system ensures that no construction or development begins without a permit issued by the community. Two sample permit applications are shown in the Appendix. Enough information must be included in the

application so that the building official can determine whether or not the proposed activity will be safe from flooding and whether or not it will increase flood hazards elsewhere.

The permit application should include the following information:

- Name and address of the applicant;
- A complete description of the proposed activity including plans drawn to scale showing
- The location, dimensions, and elevations of the area in question and of all existing or proposed structures, fill, storage of materials, drainage facilities, or any other landscape alterations;
- The elevation of the lowest floor (including basement) of all proposed buildings;
- The base (or 100-year) flood elevation at the site;
- The ground elevations at the site;
- Certification by a registered professional engineer or architect that any floodproofing methods to be used (applicable for non-residential buildings only) meet NFIP criteria; and
- Verification that all required state and federal permits have been obtained.

PERMIT FEES

It is common to make the builders of projects in the floodplain bear the cost of the permit system. Fees should be set to pay for the salary and expenses of permit administration. Many communities pay their inspector a set amount for each permit issued. Permit fees could be made higher for large or commercial projects that would necessitate more inspections, and lower for less complex developments such as the installation of manufactured homes or building additions.

OTHER PERMIT REVIEW AUTHORITIES

Depending on the type, magnitude, and location of the project, other federal, state, and local authorities may have jurisdiction over the proposed development. The local floodplain administrator should keep abreast of these various other authorities and be sure that developers obtain all necessary permits before proceeding with work in the floodplain.

The primary federal agency that may have permit authority over floodplain activities is the U.S. Army Corps of Engineers. The Corps has authority to regulate the discharge of dredged or fill materials into rivers, lakes, streams, and adjacent wetlands (Section 404 of the Clean Water Act, 33 USC 1334). The Corps also regulates all construction activities on navigable waterways (Section 10 of the River and Harbor Act of 1889, 33 USC 403).

The primary state agency with permit authority over floodway activities is the Illinois Department of Natural Resources/Office of Water Resources (IDNR/OWR). IDNR/OWR floodway permit requirements are outlined in the next chapter (see Chapter 4). Other state agencies that may have jurisdiction over floodplain work include:

1) The Illinois Environmental Protection Agency (IEPA). IEPA provides water quality certification as required by section 401 of the Clean Water Act. This certification is mandatory for all projects requiring a Corps Section 404 permit. In addition, IEPA requires permits for water supply and waste treatment systems, certain landfills and mining activities and other miscellaneous projects;

2) The Illinois Department of Natural

Resource/Office of Realty and Environmental Planning (IDNR/OREP). IDNR/ OREP does not issue permits for work in streams or floodplains. However, IDNR/OREP is responsible for preserving and conserving the state's natural resources and has review responsibilities for projects that may impact those resources. IDNR/OREP also has endangered species protection authority; and

3) The Illinois Historic Preservation Agency (IHPA). IHPA has authority to identify and protect certain prehistoric and historic properties.

Possible other local authorities that may have jurisdiction over floodplain development include:

1. The county or adjacent municipalities (as a result of intergovernmental agreements);
2. Drainage or drainage and levee districts;
3. Sanitary districts;
4. River conservancy districts;
5. Park districts;
6. Soil and water conservation districts; and
7. Other departments in the community such as the Fire Marshal or Health Department.

MAINTAINING RECORDS

The building official is responsible for keeping all appropriate records related to the floodplain ordinance. A complete record must be kept for every permit application. This is particularly important when a permit is denied and when a request is made for a variance. Normally a file folder is kept for each project. As a minimum, the file should contain:

- the application for permit,
- copies of all letters pertaining to the

- project,
- photographs,
- copies of state and federal permits,
- elevation certificate (documenting the lowest floor elevation),
- floodproofing certificate (when applicable),
- copies of any map changes (when applicable).

The official should have sufficient up-to-date copies of the floodplain ordinance, flood maps and map revisions, flood insurance study, federal regulations, and manuals. These could be used by each prospective applicant. They could also be given or sold (to pay for reproduction) to frequent applicants, bankers, real estate agents, or contractors.

DOCUMENTING ELEVATIONS

The local ordinance requires that the lowest floor (including basement) of all new buildings be at or above the flood protection elevation (or, for nonresidential structures only, floodproofed to that level). The building official must keep a record of these elevations. The elevation record is used both to confirm that new buildings are properly constructed and set the flood insurance premium on the building. A diagram showing lowest floor locations on a variety of building types can be found in the Appendix of this manual or on the www.FEMA.gov web site.

NOTE ** It is very important that the elevation of the lowest floor (including basement) be properly obtained and recorded for each new building in the floodplain. The elevations must be as-built (Record Drawings) elevations.**

In recording elevations it is necessary to use the same datum used in the flood insurance

study, usually mean sea level or National Geodetic Vertical Datum (NGVD). Lowest floor elevations are measured at the top of the floor or slab.

The Federal Emergency Management Agency (FEMA) has developed an *elevation certificate* which can be used to record lowest floor elevations. The form also has a place to indicate the elevation of the grade adjacent to the structure. The elevation certificate should be completed by the building official, an engineer, an architect or a surveyor.

An example of the Elevation Certificate is included in the Appendix. The form can also be downloaded from the www.FEMA.gov web site. FEMA also provides floodproofing certificates so that local officials may document that non-residential structures have been adequately floodproofed. These certificates must be completed by a registered engineer or architect.

An example of the Floodproofing Certificate is included in the Appendix. The Floodproofing Certificate can also be downloaded from the www.FEMA.gov web site.

VARIANCES

A variance is a waiver of one or more of the specific standards of the floodplain ordinance. Variance requests should be considered very carefully. A variance should be granted only for a unique situation on a specific site. Under no circumstances should the granting of variances establish a pattern or set a precedent that is inconsistent with the intent of the floodplain regulations. Such a pattern could result in the community's suspension from the NFIP.



The following determinations should be made prior to the granting of a variance:

1. the activity is not in a regulatory floodway;
2. the development activity cannot be located outside the floodplain;
3. an exceptional hardship would result if the variance were not granted;
4. the relief requested is the minimum necessary;
5. there will be no additional threat to public health or safety, or creation of a nuisance;
6. there will be no additional public expense for flood protection, rescue or relief operations, policing, or repairs to roads, utilities, or other public facilities;
7. the applicant's circumstances are unique and do not establish a pattern inconsistent with the intent of the NFIP; and
8. all other required state and federal permits have been obtained.

Generally, the most difficult determination is "hardship". The fact that elevating a building increases construction costs is NOT considered a hardship. The applicant must prove that without a variance a substantial hardship will be suffered. Before the variance is issued, it is very important that the community notify the applicant in writing that the granting of a variance may:

- 1) result in increased premium rates for flood insurance up to \$25 for \$100 of coverage; and
- 2) increase the risks to life and property.

Further, the community should require that the applicant acknowledge in writing the assumption of the risks and liability and hold the community harmless from future liabilities.

Once again, the community should maintain a well documented file on any variance. The file should include all findings of fact, the signed release of liability, the lowest floor elevation of the structure, and any correspondence on the request.

A step-by-step variance documentation form is located in the appendix of this manual.

INSPECTIONS

After a permit is issued, the building official is responsible to ensure that the project is built according to the approved plans. This can be done by one of two methods. The easier method is to require the applicant to have an engineer inspect the project and certify to the community that it was done in accordance with the permit. For certain very technical projects, this method is preferable; the permittee can probably afford it and most building officials

are not technically qualified to judge adequate floodproofing.

However, in most cases, such a method is not warranted. Development projects, including buildings on fill or elevated on stilts or piles, can be inspected by the building official. When the development is a building, at least three inspections are suggested.

1. After the foundation is staked out, but before construction is begun. This inspection should ensure that the building is properly located on the site. The builder should not start the foundation until this inspection has been passed.

2. When the foundation is completed. This inspection should verify the elevation of the lowest floor. The builder should not proceed with the walls or finished floor until this inspection has been passed. If the floor elevation is not high enough, the permit may be revoked until the foundation is corrected.

3. When construction is completed. A final inspection should be made to confirm that the building meets all the requirements of the floodplain ordinance including any openings and utilities. The as-built lowest floor elevation must be surveyed and documented on an elevation certificate.

USE OR OCCUPANCY PERMITS

Many communities require that a new building cannot be used or occupied without a use permit or a “certificate of occupancy”. The official would not issue a use permit until the building passes the final inspection. In a floodplain, this includes final certification of the as-built lowest floor elevation.

VIOLATIONS AND ENFORCEMENT

When the building official confirms that floodplain development is underway without a permit, or that a project is being built contrary to the permitted plans, the city, village, or state’s attorney should be consulted.

A “stop work” order should be delivered to the owner as soon as possible. If a development project is found to violate the provisions of the ordinance, the official should notify the property owner, in writing, of the nature of the violation and order corrective measures to be taken. Some communities include in their ordinances a provision that gives the local building official power to revoke a permit.

When the official and the attorney cannot persuade the developer to comply with the ordinance, the attorney should take legal action which may include obtaining a court order to stop the development. The attorney can also seek a fine and an order for the developer to bring the project into compliance.

Occasionally, the community is at fault for failing to notify a developer or property owner of the floodplain permit requirements. These situations are much more difficult to resolve. The homeowner legally obtained a permit from the community and therefore often feels he should not be held liable to correct the violation. Again, the municipal attorney should be consulted. In some cases, a community’s Errors and Omissions Insurance Coverage will help to defray the necessary corrective actions.

In either situation, a violation is expected to be corrected to the “greatest extent practicable”. Failure to do so, could result in the community

being suspended from the National Flood Insurance Program.

HELP IN ENFORCEMENT

The community is not alone in wanting its ordinance enforced. Help in dealing with violations is often available from other sources. Your first point of contact can be IDNR/OWR.

IDNR/OWR has published a "Floodplain Compliance Manual" for community officials which can be provided upon request. In addition, staff will work with you to determine the best way to deal with any particular violation and to provide expert advice.

If the project is in a floodway (or a floodplain here no floodway has been mapped), construction without an IDNR/OWR permit may be a violation of state law. If the project is in a wetlands area, development without a Corps of Engineers permit may be a violation of federal law. The building official should contact IDNR/OWR and the Corps of Engineers to ascertain whether the project is a violation of state or federal law and, if so, discuss mutual enforcement actions.

SECTION 1316 DENIAL OF INSURANCE

If a project violates the local floodplain ordinance, and the building official has exhausted all other remedies, NFIP flood insurance can be denied on the structure. Section 1316 of the National Flood Insurance Act provides for denial of flood insurance coverage on a building in violation of the local floodplain management ordinance. This technique is especially useful for new construction that will be sold to someone else.

Without flood insurance, the buyer will have an extremely difficult time trying to obtain a mortgage from most lenders. For guidance on a 1316 declaration, contact the FEMA regional office.

Enforcement of the floodplain ordinance must not be taken lightly. Failure to take action against violations jeopardizes the integrity of the regulatory program. Communities that do not enforce their floodplain ordinance could be suspended from the NFIP (see page 9 - Effects of Non-Participation in the NFIP).

Chapter 4

State Regulations: Preventing Increased Flood Heights and Resulting Damages

During the 1800's, there were many occasions when railroads and other development blocked drainage ways and floodplains. As resulting flood damages increased, many law suits occurred. Since then, Illinois courts have consistently ruled that it is illegal to block the flow of surface waters so as to cause damage to others.

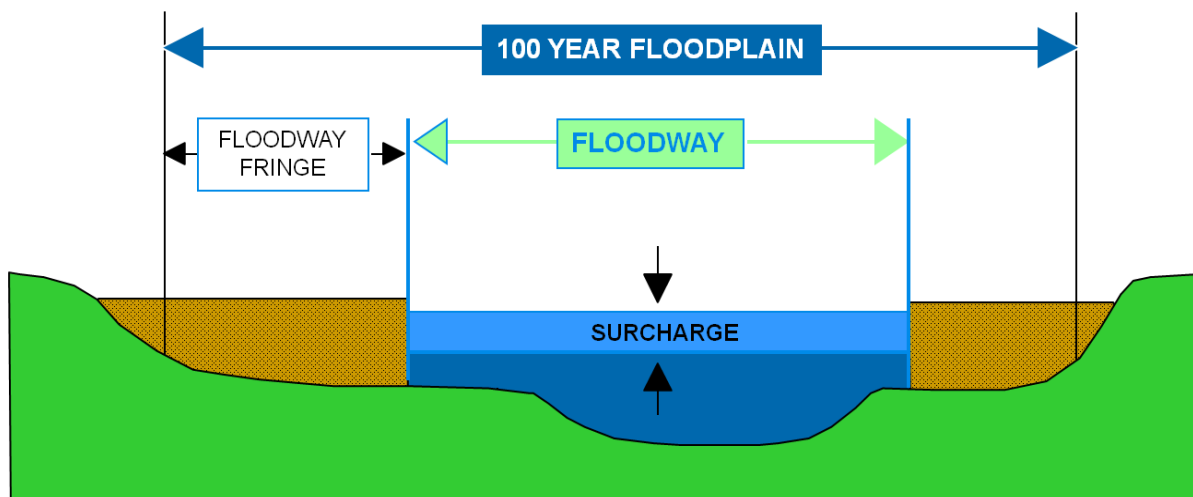
The primary purpose of state floodplain regulation is to prevent construction projects which might increase flood risk or cause damages to others. This is done by withholding the development permit until the project plans are reviewed to ensure that no obstruction to flood flows, loss in storage, or increases in flood damages will occur.

Needless to say, trying to determine a proposed project's effect on flood heights can be difficult and expensive, particularly when future developments must be considered. To reduce this regulatory burden on communities and property owners, the state and federal governments have financed detailed Flood Insurance Studies for those floodplain areas where development is most likely to occur. These studies include detailed mapping and the calculation of a floodway. In addition, the state will review floodway development proposals to ensure that obstruction to flood flows will not occur.

THE FLOODWAY

The determination of a floodway and the resulting map are based on the following legal concepts:

- Property owners should be allowed to develop their land provided they do not cause damage to others, and



FLOODWAY + FLOODWAY FRINGE = 100 YEAR FLOODPLAIN
SURCHARGE NOT TO EXCEED 0.1 FOOT

- Properties on both sides of a stream must be treated equitably. The degree of obstruction permitted for one must also be permitted for the other.

The floodway study is usually done with a computer. At each cross section, hypothetical obstructions are placed at the two edges. The computer assumes the base flood is flowing through the cross section (an equal amount of carrying capacity is taken from both sides) and the computer monitors increases in flood heights. The movement of the obstruction is stopped when the flood level reaches a predetermined increase related to increasing damages. In Illinois, this increase is limited to 1/10 (0.01') foot.

Two lines are then drawn marking where the obstruction was stopped. These lines generally divide the floodplain into three areas: the center area of faster moving water called the floodway and two areas of shallow, slow moving or still water at the edges called the fringe (**Fig. 14**).

Development outside of the floodway: Once a floodway is delineated, the job of the floodplain regulator is greatly simplified. When a permit application is submitted, the building official checks the site location in relation to the floodway boundaries. This is easily accomplished by scaling the distance onto the floodplain map. If the site is in an identified fringe (in other words, outside of the floodway), the building official knows the development will most likely not cause flood damage to others: the floodway study already calculated that fringe obstructions will not cause a significant increase in flood heights. (NOTE: this does not mean that the development will not create a localized drainage problem, only that it will not

block the flow of waters from flooding of the stream that was studied). A local floodplain development permit review must still take place. Development within the floodway: When a development site is determined to be within the floodway, or in a floodplain where the floodway has not been identified, the community must require that the applicant first obtain a permit or "letter of permit not required" from the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR).

STATE PERMIT REVIEW

In accordance with the Rivers, Lakes and Streams Act, 615 ILCS 5/5 thru 29a (1992 State Bar Edition) IDNR/OWR regulates construction activities in the floodways of streams draining 1 square mile (640 acres) or more in urban areas and 10 square miles (6400 acres) or more in rural areas. The purposes of IDNR/OWR's regulations are to prevent increased flood damages and to protect the public interests and uses in the state's public bodies of water.

IDNR/OWR does not have authority to ensure that the building protection standards of the National Flood Insurance Program (NFIP) or local communities are met. Compliance with building protection standards must be assured by local permit review.

Complete State regulations can be viewed at www.dnr.state.il.us/owr/resman

Appropriate Uses

In NE Illinois, the only development permitted in a floodway are "appropriate uses," which will not cause a rise in the base flood elevation or

loss of storage, and will not create a damaging increase in flood heights or velocity.

Appropriate uses include flood control structures, athletic fields, recreational facilities, open parking areas, detached garages and accessory structures, floodproofing activities, and other minor alterations. They do not include buildings, building additions, fences, or storage of materials.

Repair to damaged buildings in the floodway are allowed provided that the repairs are less than 50 percent of the market value of the structure before it was damaged and the outside dimensions of the building are not increased. If damages are greater than 50 percent of the market value of the structure before it was damaged and the outside dimensions of the building are not increased. If damages are greater than 50 percent of the pre-flood market value, then the building may be repaired provided that it is properly elevated and the building footprint is not increased. A second story addition above the BFE is also allowed if the buildings footprint is not increased and the addition is valued at less than 50 percent of the market value of the building before the addition was added. The goal of this requirement is that vacant floodways will essentially remain as open space, free of buildings or other structures.

Exempted Activities

Over the years, certain minor construction activities have been exempted from IDNR/OWR floodway review either by legislative action or administrative decision. Exempted activities include:

1) Installation of field tile systems, tile outlet structures, and any water or sediment control

construction activity in any floodway land (overbank) area which would not obstruct flood flows such as grade stabilization structures and waterways;

2) Installation of irrigation equipment in any floodway land (overbank) area;

3) Work on private lakes which would not impact the dam or traverse the lake such as the construction of boat docks, bank stabilization and maintenance dredging;

4) Removal of brush, woody vegetation, trash or other debris;

5) Routine maintenance and repair of existing structures;

6) Maintenance and repair, to preserve design capacity and function, of artificially improved stream channels, drainage ditches, levees and pumping stations; and

7) Installation of fences in rural areas.

Statewide Permits and Regional Permits

There are many types of smaller non-obstructive development activities which occur on a daily basis in the state's floodplain areas. IDNR/OWR has chosen not to review these activities in detail since they have limited potential to cause an increase in flood heights or damages.

In order to eliminate time consuming state permit review, IDNR/OWR has issued several "Statewide and Regional Permits". Projects done in accordance with the conditions of a Statewide Permit do not need an individual state permit. The developer should obtain a

copy of the applicable Statewide or Regional Permit from IDNR/OWR prior to construction and closely follow the construction criteria outlined in the Statewide or Regional Permit.

Statewide and Regional Permits which have been issued include:

SWP-2-Bridges and Culverts in Rural Areas on Streams Draining Less Than 25 Square Miles

SWP-3-Barge Fleeting Facilities

SWP-4-Aerial Utility Crossings

SWP-5-Minor Boat Docks

SWP-6-Minor Floodway Construction

SWP-7-Outfalls

SWP-8-Underground Pipeline and Utility Crossings

SWP-9-Minor Shoreline and Streambank Protection Activities

SWP-10-Accessory Structures and Additions to Existing Residential Buildings

SWP-11-Minor Maintenance Dredging Activities

SWP-12-Bridge and Culvert Replacement Structures or Bridge Widening

SWP-13-Temporary Construction Activities

SWP-14-Special Uses of Public Waters

RP-3- Minor Projects in Designated Floodways (Utilities, Sewer Outfalls, Outlet Channels, Paths and Recreational Equipment, and Shore Protection).

A listing of Statewide Permits and conditions can be viewed online at: <http://dnr.state.il.us/owr/ResmanStatewidePermits>

Public Waters

Public waters are those rivers and streams which are owned by the citizens of Illinois. IDNR/ OWR's regulations also protect the public interests and uses in the state's public bodies of water. Development activities which

are proposed along the identified Public Bodies of Water must meet state construction guidelines and a public notice period. Development on a Public Body of Water cannot restrict the public's use of that waterway. The listing of Public Bodies of Water can be found at:
<http://dnr.state.il.us/owr/Resman>

Dam Safety

IDNR/OWR also regulates the construction and maintenance of dams within the state. The State of Illinois issues permits for the construction, operation and maintenance of new dams and the operation and maintenance of dams which existed prior to September 2, 1980. Dams are classified by the state based on both size and hazard potential. A large dam with residential housing downstream will be classified at a greater risk than a small rural farm pond dam with no downstream housing. There are three hazard classifications. All dams in the two higher classifications are required to have a permit under these rules. Dams in the lower hazard classification require a permit for construction or modification if they meet certain size criteria. Anyone proposing to construct a new dam is recommended to submit a preliminary design report to the state as early as possible.

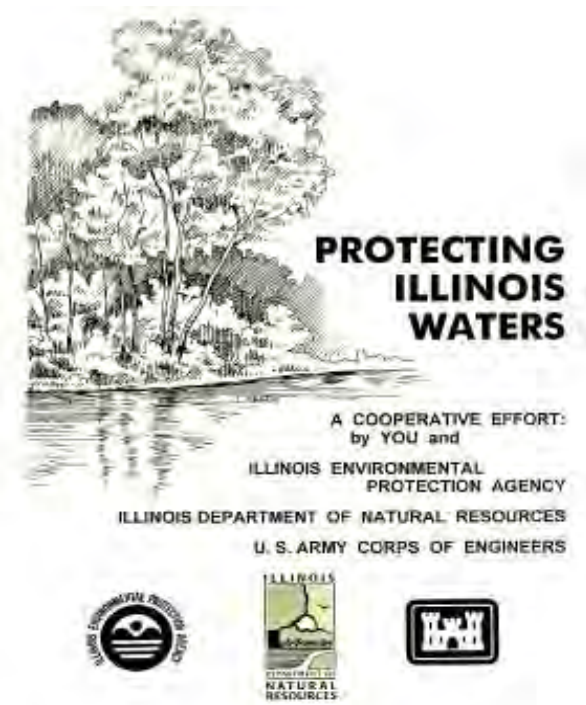
Contact IDNR/OWR for further guidance.

Application Process

Applicants for an IDNR/OWR permit must complete the "Protecting Illinois Waters" application form which is shared by the U.S. Army Corps of Engineers, the Illinois Environmental Protection Agency, and IDNR/ OWR (see Appendix for jurisdictional boundaries and addresses). Note that each of

these three agencies has its own authority and permit requirements. For any particular project, permits may be required from any or all of the agencies.

In addition to the application form, an applicant for an IDNR/OWR permit must submit project plans and possibly, depending on the type of project, detailed engineering analyses of the project's effects on flood heights and velocities. IDNR/OWR does not issue a construction permit until it is satisfied that the work will not singularly or cumulatively increase flood



damages outside the project right-of-way. When the state permit is issued, local officials can usually be assured that the floodway requirements of the local ordinance have also been met. The State permit application form can be downloaded and printed from the IDNR website at:
<http://dnr.state.il.us/owr/Resman>

When Floodways Are Not Delineated

For a number of communities in Illinois, floodways may not have not been designated. These communities must still make sure that new development will not cause increased damages. As has been mentioned earlier, an applicant for any work in the floodplain (where there is no identified floodway) should be referred to IDNR/OWR for state review of the project. In the vast majority of cases, the state review will ensure that this standard is met, either by a determination that the site is not in the floodway, or by a detailed review of the project proposal. In either case, IDNR/OWR provides notification of its determination to both the applicant and the community. If an IDNR/OWR determination is not available (because, for example, the project is not under state jurisdiction) the local regulatory official should require sufficient plans and data from the applicant to determine that the project will not damage other properties.

COMPENSATORY STORAGE

In urbanized areas, the uncompensated loss of natural floodplain storage within the floodplain can increase off-site floodwater elevations and flows. By compensating for the loss of floodplain storage, increased flooding as a result of development can be reduced. This compensation for lost flood storage is called compensatory storage and is defined as “an artificially excavated, hydraulically equivalent volume of storage within the floodplain used to balance the loss of natural flood storage capacity when artificial fill or structures are placed within the floodplain.” Compensatory storage must be provided for any regulatory floodway. IDNR/OWR and the NE Illinois Planning Commission (NPIC) recommend a safety factor for compensatory storage equal to at least 1.5 times the volume of storage lost to

compensate for uncertainties in the estimate of the base flood elevation and in the determination of project impacts. The compensatory regulatory floodway storage shall be placed between the proposed normal water elevation and the proposed 100-year flood elevation. All regulatory floodway storage lost below the existing 10-year flood elevation shall be replaced below the proposed 10-year flood elevation. All regulatory floodway storage lost above the existing 10-year flood elevation shall be replaced above the proposed 10-year flood elevation. All such excavations shall be constructed to drain freely and openly to the watercourse.

Compensatory storage in the flood fringe is not mandatory but highly recommended at 1.5 times the flood fringe storage lost to provide an adequate margin of safety. If a community does not include compensatory storage within the flood fringe, IDNR/OWR will require that all future mapping will have storage floodways rather than the current conveyance floodways. Storage floodways are normally wider than conveyance floodways and will result in the more stringent "Appropriate Uses" requirements being enforced in a larger area of the community. In those floodplain areas where floodways have not been identified, compensatory storage must be provided.

Chapter 5

Protecting Buildings

The National Flood Insurance Program (NFIP) requires that any new building or substantially improved building located in a floodplain be constructed in a way that will protect it from the base flood.

There are three basic methods of providing building protection:

1. elevation on fill;
2. elevation on stilts, pilings, walls, or other foundation; and
3. dry floodproofing. (Note: dry floodproofing is allowed only for nonresidential structures).

Small additions and inexpensive buildings (less than \$1000.00) may be exempted from the building protection standards.

“BUILDING”

The term “building” is defined as a structure that is principally above ground and enclosed by walls and a roof.

Buildings must be protected from flood damage for three reasons:

1. They are the most important, most valuable, and most common man-made structures subject to flood damage. Floodplain regulations are intended to prevent flood damage.
2. They are usually occupied or used by people. Protecting them protects human life and health and reduces human suffering.
3. Buildings and their contents are the only

things covered by an NFIP flood insurance policy. Protecting them reduces flood insurance claims that are subsidized by the taxpayer.

These reasons should be kept in mind when deciding whether a development project qualifies as a “building”. For example, a manufactured home is considered a building for regulatory purposes, as is an unlicensed travel trailer or recreational vehicle on site for more than 180 days. Structures that are not enclosed are not buildings. These would include carports, open pavilions, and tents.

Residential Buildings

Residential structures which are new or substantial improvement must have the lowest floor (including basement) elevated to or above the base flood elevation. The local building official must maintain documentation that the elevation of the lowest floor is at or above the base flood elevation. Any area below the flood protection elevation must be constructed of flood resistant materials and designed so as to minimize damages.

Non-Residential Buildings

New construction or substantial improvements of commercial, industrial, or other non-residential structures must ensure that the lowest floor (including basement) is elevated, or the structure must be dry floodproofed, to at least the base flood elevation. Documentation of meeting either the elevation or floodproofing requirements must be maintained by the local building official. Floodproofed nonresidential buildings must be certified on a FEMA Floodproof Certificate by a registered professional engineer or architect.

HOW FLOODS DAMAGE BUILDINGS

In order to protect new buildings, it is important to understand how floods damage buildings. A flood can directly damage a building in three ways:

1. Hydrostatic Pressures-the lateral pressure of standing water can push over walls or break windows. Hydrostatic pressure increases as water gets deeper. Once the ground under a building is saturated, hydrostatic pressure from underneath can crack a concrete floor or even float a wood frame house (**Fig. 15**).

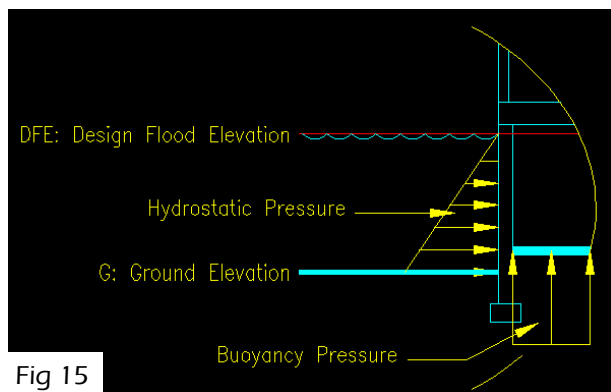


Fig 15

2. Hydrodynamic Forces-the effects of current, waves, and floating debris or ice can batter down walls. These effects increase with the velocity of flood flows. For this reason, the construction of buildings should be avoided altogether in areas where velocities would exceed 5 feet per second or in the floodway where flows are the greatest (**Fig. 16**).

Hydrodynamic Forces On A Building

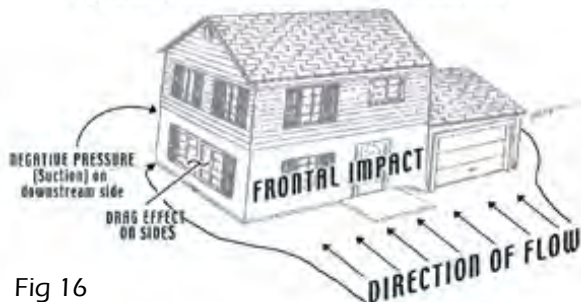


Fig 16

3. Wetting-contact with water can warp, decompose, rot, or otherwise ruin certain materials. Especially damage prone are wood, drywall, carpeting and most furniture and contents. In addition, floodwater is often contaminated. Any materials exposed to floodwaters should be discarded or thoroughly cleaned with a disinfectant.

THE FLOOD PROTECTION ELEVATION (FPE)

All newly constructed buildings in the floodplain must be protected against the base flood. The way this is accomplished is to elevate the building or, in the case of a non-residential building, floodproof the building to the flood protection elevation (FPE). This term is defined as the base flood elevation plus some margin of safety. This margin of safety is called "freeboard".

Freeboard compensates for additional hazards or unpredictable factors that accompany the base flood. These include wave action, downstream obstructions, ice or log jams, damage to floor joists, and floods which may exceed base flood elevation calculations. Freeboard will also ensure that any ductwork or electrical work in the floor joists are protected from flood damage. The NFIP does not require freeboard be enforced. However, the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR) strongly recommends that a community adopt a freeboard appropriate to the local flood hazard. In ponding areas, it could be 1/2 foot. On the Mississippi or Illinois Rivers it could be up to 4 feet because of wave action and debris. For most areas in the state, one or two feet is appropriate. The State Model

ordinance as well as most countywide ordinances adopt a 1 foot freeboard.

METHODS OF ELEVATING BUILDINGS

New construction in the floodplain must be protected from flood damage. The most common method is elevating the structure to ensure that the lowest floor (including basement) is at or above the flood protection elevation. This can be accomplished by several methods. These methods generally apply to building sites in the flood fringe. While any of these methods might be allowed in the floodway, public safety (and the safety of emergency crews) as well as the increase risk of damage must be carefully considered. In addition, all floodway construction must first receive state permit approval (see Chapter 4).

Crawlspace

Crawlspaces are commonly used as a method of elevating buildings in floodplains. When flood elevations are relatively shallow, designing a building with a crawlspace can often meet the elevation requirement (**Fig. 17**).

The IDNR/OWR and FEMA do **not** recommend below-grade crawlspaces in flood-prone areas. It is strongly recommend that crawlspaces in the floodplain be designed so that the interior grade of the crawlspace and the exterior grade are at the same elevation. This will allow flood waters to flow freely underneath the home during shallow flood events (**Fig. 18 a & b**). Flow-through crawlspaces will also reduce the likelihood of problems associated with water accumulation, moisture damage, drainage and health hazards, such as growth of bacteria, mold and

fungus.

Although not recommended, FEMA regulations do allow the construction of below grade crawlspaces. If a community chooses to allow the construction of below-grade crawlspaces in floodplain areas, several conditions must be met:

- The interior grade of a crawlspace must not

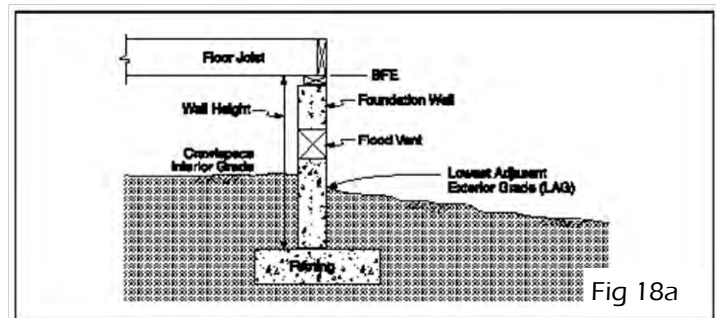


Fig 18a

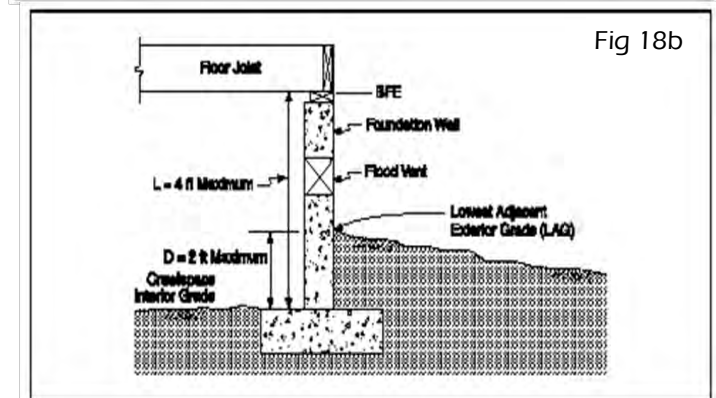


Fig 18b

be more than 2 feet below the exterior lowest adjacent grade (LAG).

- The total height of the below-grade crawlspace must not exceed 4 feet at any point.
- There must be adequate drainage to remove floodwater from the interior area of the crawlspace.
- All materials below the flood protection elevation must be flood resistant.

- Heating, ventilating, and air conditioning can not be located in the crawlspace.
- The crawlspace must comply with properly sized flow-through opening requirements (1sq in. per sq ft).

It is important to note that a below grade crawlspace will also result in higher flood insurance premiums.

* NOTE* Based on popularity in the midwest, the State Model Floodplain Ordinance references these specific construction criteria allowing crawlspaces below the flood protection elevation. Some communities may prefer NOT to allow below grade crawlspaces.

Further guidance can be found by referencing: “Crawlspace Construction for Buildings Located in Special Flood Hazard Areas” (FEMA Technical Bulletin 11-01) The bulletin can be obtained at: <http://www.fema.gov/mit/techbul.htm>

Fill

The use of a poured slab over fill will often meet the elevation requirement when flood heights are not excessive.

When flood elevations are higher, a



combination of fill with a crawlspace or block foundation may meet the elevation requirement.

When using fill to elevate a structure, the following conditions should be met::

- Fill should be placed in layers no greater than six inches deep before compaction.
- The fill should extend at least ten feet out beyond the foundation of the building before sloping below the base flood elevation.
- The fill should also be protected against erosion and scour during flooding by vegetative cover, rip rap, or other measures.
- If vegetative cover is used, the slopes should be no steeper than 3 horizontal to 1 vertical.
- The fill should not adversely affect the flow of surface drainage from or onto neighboring properties.

It is important to note that when a building site is filled, it is still considered in the floodplain and no basements are permitted. As mentioned previously, the building’s lowest floor must be at or above the flood protection elevation.

The only exception to this rule is when a Letter of Map Revision based on Fill (LOMR-F) has been issued by FEMA and the community provides “reasonable assurance” that the lower area will never flood. The State of Illinois strongly discourages the construction of basements below the flood protection elevation in filled areas.

Stilts, Piles, Poles, and Walls

When flood heights are extreme, most buildings can only meet the elevation requirement by being constructed on stilts, piles, poles, or walls so that all damageable parts of the building are at or above the flood protection elevation.



When using stilts, poles, piles or walls to elevate, the following conditions must be met:

- Supporting members must be designed to resist hydrostatic forces, hydrodynamic forces, and wetting effects of flooding.
- The design and supporting members should be certified by a Professional Engineer to ensure that they resist the effects of debris, ice, wave action, etc. It is important that the design of an elevated foundation allow flood waters to enter and exit lower areas without damage to the structure.

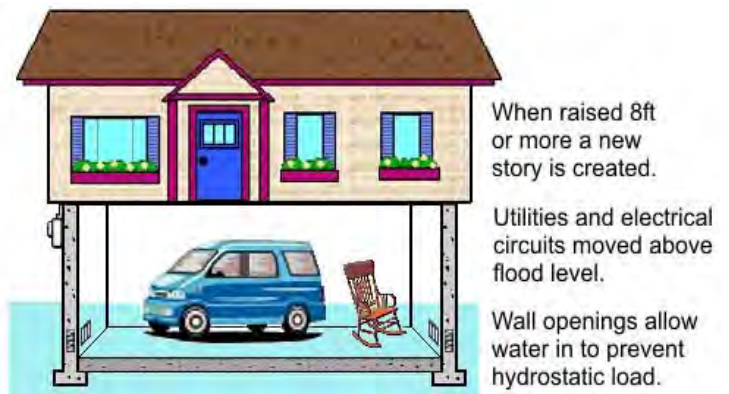
Keeping the area below the lowest floor open is the best way to prevent flood damage. However, the owner may want to ensure that the lower area is protected against vandalism, animals, etc. This can be done with screening or open lattice work. It is important that the

lower area is not converted to habitable space sometime in the future. The IDNR/OWR recommends that local officials have the building owners sign a Non-Conversion Agreement at the time of permitting. An example of this agreement is included in the appendix of this manual.

FULLY ENCLOSED LOWER AREAS

In areas of deeper flooding, a homeowner may choose to elevate a structure on walls and make use of the enclosed lower area. When elevating a structure with enclosed walls, very limited uses are allowed below the base flood elevation. These uses are limited to: parking of vehicles, building access (stairs, etc.), and minimal storage. It is important that the lower area is not later converted to habitable space. A Non-Conversion Agreement should be required on all buildings with enclosed lower areas. A sample non-conversion agreement is included in the appendix of this manual.

Enclosed areas located below the flood



Lightweight or mobile items can be stored under the house and moved after the flood warning

When raised 8ft or more a new story is created.

Utilities and electrical circuits moved above flood level.

Wall openings allow water in to prevent hydrostatic load.

protection elevation must meet several conditions:

1. Service equipment such as furnaces, air conditioners, heat pumps, hot water heaters,

washers, dryers, elevator lifts, electrical junction ductwork, circuit breaker boxes, and food freezers are **NOT** permitted below the base flood elevation.

2. All walls, floors, and ceiling materials located below the flood protection elevation must be unfinished and constructed of materials resistant to flood damage
3. The walls of any enclosed area below the flood protection elevation must be designed and constructed in a manner to prevent flotation, collapse, and lateral movement of the structure.
4. The walls must have permanent openings. These openings must:
 - a. have a total net area of not less than one square inch of opening for each square foot of enclosed area subject to flooding,
 - b. allow flood waters to automatically enter into, flow through, and drain from the enclosed area,
 - c. there should be at least two openings on different sides of each enclosed area,
 - d. the bottom of all openings must not be higher than one foot above grade,
 - e. if flood heights could rise to within two feet of the lowest floor, air vents should be installed.

In lieu of these opening requirements, the design could be certified by a registered professional engineer.

Basements

Any area with a floor below grade on all sides is considered a basement by the NFIP. In certain situations this could even include a typical “crawl space” or walk-out basement”. NFIP regulations require that the lowest floor of any building in a floodplain be at or above the flood protection elevation. Therefore, basements cannot be allowed in a floodplain. The only exception to this rule is the specific crawl space criteria listed above.

Walk Out Basements

Many newer subdivisions in Illinois are designed to contour along existing streams. Many of the lots in these subdivisions back up to a stream. Local Officials should be very aware of these types of developments. Although the building footprint itself may be located on a bluff line and outside of the floodplain, an excavated walk-out basement can bring the floodplain right back to the home! In recent years, the walk-out basements in many of these newer subdivisions have flooded due to poor design. Walk out basements should always be constructed above the flood protection elevation even when the building “footprint” is located outside of the floodplain.

FLOODPROOFING NONRESIDENTIAL BUILDINGS

Floodproofing is permissible ONLY for nonresidential structures.

Dry Floodproofing

Dry floodproofing means making the building watertight and structurally strong enough to resist flood pressures.

Dry floodproofing is very difficult and expensive. Water pressures that accompany a flood, dry floodproofing can be a tricky and dangerous endeavor. Walls of cinder block or concrete can collapse under as little as 3 feet of flood depth. Because of the technical expertise required, the NFIP requires the applicant to demonstrate that the building is properly designed by a registered professional engineer.



For this reason, a signed floodproofing certificate (**Fig. 19**) from a professional engineer must be maintained on file for every floodproofed structure.

The floodproofing measures must be taken on the building itself. Protection around the structure such as sandbagging or berms are not considered dry floodproofing measures.

Both the Corps of Engineers and the FEMA have detailed publications on floodproofing. These publications can be ordered from the FEMA web page at www.FEMA.gov

O.M.B. MC
Expires 3/01

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

Engineering of non-residential buildings may be permitted as an alternative to elevating it or above the Base Flood Elevation; however, testing design certification is required. This form is to be used for that certification. Floodproofing of a residential building does not satisfy any of the Floodplain Management Ordinance requirements or affect the insurance rating unless the community has been notified or except in other floodproofed residential basements. The permitting of a floodproofed residential basement requires a separate certification if a design complies with the local floodplain management ordinance.

OWNER/LEASEE		FOR INSURANCE COMPANY USE	
ADDRESS (including Apt., Unit, Suite, and/or Bldg. Number) (SEE FLOOD MAP FOR ADDRESS)		POLICY NUMBER	
DESCRIPTION (Lot and Block Numbers, etc.)		COMPANY AND NUMBER	
STATE		ZIP CODE	

SECTION I FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

is the following from the proper FIRM:

CENSUS NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM INDEX	FIRM ZONE	BASE FLOOD ELEVATION (in AC-Feet, Mean Sea Level)

SECTION II FLOODPROOFING INFORMATION (By a Registered Professional Engineer or Architect)

Floodproofing Design Elevation Information:

Building is floodproofed to an elevation of _____ feet MSLVD. (Elevation datum used must be the same as that on the Flood Map.)

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

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

SECTION III CERTIFICATION (By Registered Professional Engineer or Architect)

Accidental Floodproofed Construction Certification:

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

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

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

I certify that the information on this certificate represents my best efforts to the best of my knowledge and belief, and I understand that any false or misleading information may be punishable by fine or imprisonment under 18 U.S.C. Code, Section 7001.

DATE: _____ LICENSE NUMBER (or Aff. Lic): _____

COMPANY NAME: _____

STATE: _____ CITY: _____ STATE: _____ ZIP CODE: _____

DATE: _____ STATE: _____ PHONE: _____

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

Form NF-45, AUG 99 Replaces all previous editions

Fig 19

“Wet Floodproofing”

Although not specifically allowed by NFIP regulations, there are occasions when it may be permissible to allow water to enter a non-residential building, of minimal value, if no damage would occur (for example, a detached garage or a storage shed). When water enters the building, pressures on both sides of the walls equalize and structural damage is less likely to occur. This method is called wet floodproofing. IDNR/OWR has incorporated this guidance into the State Model Floodplain Ordinance.

IDNR/OWR recommends that wet

floodproofing be allowed **only if all** of the following conditions are met::

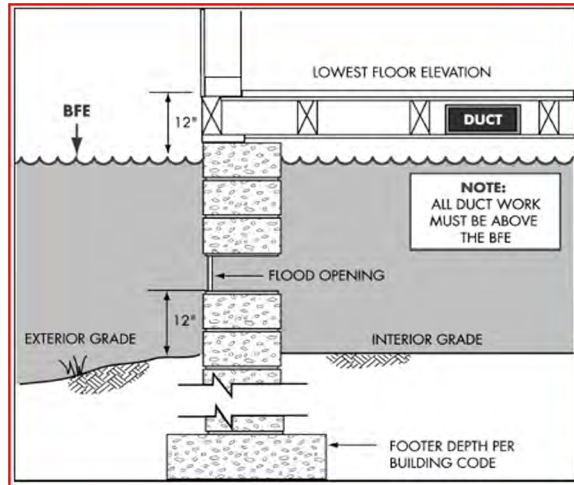
- the structure shall be non-habitable;
- the structure shall be used only for storage or parking and will not be later modified for a different use;
- below the flood protection elevation, the structure shall be built of materials not susceptible to flood damage;
- all utilities, (plumbing, heating, air conditioning, electrical equipment, etc.) shall be above the flood protection elevation;
- the structure should have at least two permanent openings on different sides no more than a foot above grade. To address hydrostatic pressure, there must be 1 square inch of opening for every 1 square foot of floor area subject to flooding.; and
- the structure shall be less than some reasonable threshold in value and/or size (such as \$7500.00 or 500 sq. ft.).

The lowest floor elevation of the structure must be documented and the owner should be advised of the flood insurance requirements (flood insurance will be extremely high). Communities should also require the applicant to sign a release of liability from granting a wet floodproofing permit or variance.

CONSTRUCTION METHODS

Constructing a building in the floodplain should be undertaken only after serious consideration of the risks of property damage and loss of

life. The following construction methods can help minimize these potential damages when parts of a structure may be exposed to flooding:

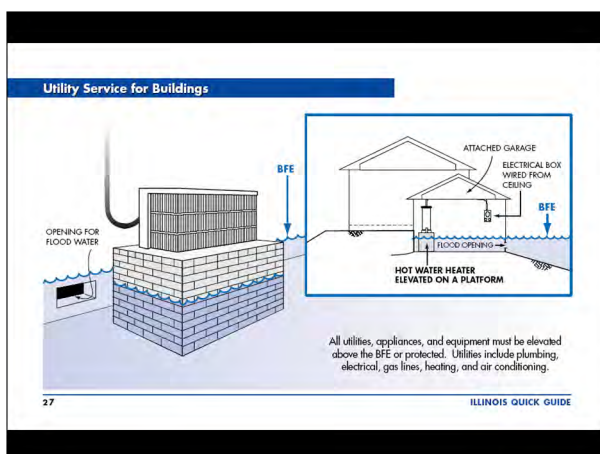


- the structure should offer the least obstruction to flood flows by being aligned parallel to the stream flow ;
- structural walls of a building should be designed to withstand the lateral forces of floodwater and the vertical or uplift forces from floodwater and rising ground water levels. Water pressure, both above and below ground, is increased by the rise of floodwater. This pressure causes increased stress on buildings' foundations, footings, and floor slabs.
- supports should be strengthened and spaced as far apart as possible to minimize the possibility of creating flow obstructions from ice or log jams, debris, etc.;
- if wave action is possible, the flood protection elevation should include appropriate freeboard;

- footings and foundations should be at sufficient depth and on load bearing soil to provide necessary lateral resistance to water pressure and should be able to resist vertical pressure; and
- floor drains and other plumbing below the base flood elevation should be fitted with valves to prevent backflow of water that would damage the interior of the building

BUILDING UTILITIES

The local ordinance requires that building utilities and machinery such as electrical, plumbing, air conditioning, and heating equipment be elevated above the flood protection elevation. Electrical wiring and outlets, air conditioners, furnaces, gas fixtures, ductwork, and similar equipment may be suspended from the ceiling or walls or elevated on pedestals in the lower area, provided they are above the flood protection elevation. Water and sewer pipes, electrical and telephone lines, submersible pumps, and



other similar waterproofed service facilities may be located below the flood protection elevation.

Septic and Water Systems

The NFIP requires that new and replacement water supply systems, sanitary sewer systems, and onsite waste disposal systems must be designed to minimize or eliminate infiltration of floodwater. Sewage systems must also be designed to avoid causing contamination during flooding. Design considerations include:

- * Manhole covers should be above the base flood elevation or designed to minimize infiltration.
- * Waste disposal facilities including pumping stations, lagoons, and treatment plants must be floodproofed or elevated to at least the base flood elevation. This is also a requirement of the Illinois Environmental Protection Agency (IEPA).
- * Dikes or levees may need to be constructed to the flood protection elevation to protect waste treatment facilities located below the flood protection elevation (also required by the IEPA).
- * On-site or private waste disposal and treatment systems such as septic tanks should be situated and constructed to avoid obstruction to flood flows and impairment due to flooding. This may be difficult, because on-site facilities may be substantially below the base flood elevation and financially difficult to properly construct. Generally, inlets to or outlets from the septic tank should be watertight or equipped with check valves or standpipes to prevent floodwater from returning through the system or discharging during a flood. FEMA has a very detailed booklet entitled "Protecting Building Utilities

from Flood Damage". This booklet can be ordered from the FEMA website at: www.fema.gov.

CONSTRUCTION MATERIALS

The area below the flood protection elevation must be unfinished and remain free of water damage. This requires that construction below the flood protection elevation be done only with materials resistant to flood damage.

Some of those materials include:

Brick, face or glaze
Cast stone in waterproof mortar
Cement/bituminous
Cement/latex
Clay tile, ceramic veneer
Concrete
Concrete block
Concrete tile
Epoxy, formed-in-place
Glass
Glass blocks
Insulation, foam or closed cell types
Metal
Paint: polyester-epoxy and other waterproof types
Polyurethane
Silicone
Steel with waterproof applications
Stone: natural or artificial
Terrazzo
Vinyl tile with asphaltic adhesives

Wood, if properly treated by pressure preservative treatment to inhibit insects and decay, can also be used as a flood resistant construction material. The professional organizations which have tested wood products make the following recommendation:

- American Wood Preserver's Bureau (AWPB) mark "C- 9" on plywood which has been pressure treated to .40 CCA minimum. (Previously marked LP-22"): acceptable for ground or water contact.
- American Wood Preserver's Association (AWPA) mark "C2" on wood (which includes material treated for ground contact as well as for above ground use only) which has been pressure treated to .40 CCA minimum:

acceptable for flood prone areas.

- American Plywood Association (APA) stamp "Rated Sheathing Exposure 1 or 2": exterior type plywood acceptable for flood prone areas.

Projects constructed with pressure treated wood will last longer if hot-dipped galvanized or stainless steel fasteners are used. Conventional nails and fasteners may corrode resulting in unsightly rust stains or separation of the wood.

Further guidance on flood resistant materials can be obtained by referencing "Flood Resistant Material Requirements" (Technical Bulletin 2-93). The bulletin can be found at the FEMA web site: www.fema.gov.

CRITICAL FACILITIES

A critical facility means any public or private facility which, if flooded, would create an added dimension to the disaster or would increase the hazard to life and health. Examples are public buildings, emergency operations and communication centers, health

care facilities and nursing homes, schools, and toxic waste treatment, handling or storage facilities. Critical facilities should be elevated to at least the 500 year flood protection elevation. In addition any ingress and egress should be protected to the 500 year flood protection elevation. The State of Illinois Executive Order also requires that any state funded or state permitted critical facilities be protected to the 500-year flood protection elevation.

MANUFACTURED (or MOBILE) HOMES

Manufactured homes in the floodplain have often been a focal point for controversy. In 1986, new FEMA regulations changed the official term from “mobile homes” to “manufactured homes”. This change required all communities in Illinois to amend their local ordinances and change all references of “mobile homes” to “manufactured homes”. In 1989, the FEMA elevation standards for manufactured homes installed in floodplain areas were revised. The new rules make manufactured home requirements different from the requirements for other buildings. The old regulation simply required new



manufactured home installations to have their lowest floor elevated to or above the base flood elevation.

Communities with “existing manufactured

home parks” (those existing prior to the effective date of the community’s ordinance) now have an additional option. At sites that have not previously suffered substantial flood damage, the elevation requirement for the lowest floor is to or above the base flood elevation, or three foot above the ground elevation, whichever is lower. Manufactured homes located outside of an existing park, or in an existing park on a site where flood damage has occurred, must still be elevated above the base flood elevation (just like any other residential building).

However, IDNR/OWR has chosen to ignore this confusing regulation and simply encourage communities to require that all manufactured homes located in a floodplain be protected to the same standard as any other residential building (lowest floor elevated to the flood protection elevation).

In addition to elevation requirements, all manufactured homes in Illinois must be anchored to meet the Rules and Regulations for the Illinois Mobile Home Tie-Down Act issued pursuant to 210 ILCS 120 (State Bar Edition). A copy of the Rules and Regulations of the State’s Tie- Down Act can be acquired from the Illinois Dept. of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761.

RECREATIONAL VEHICLES AND TRAVEL TRAILERS

Travel trailers and recreational vehicles can remain onsite within a floodplain for more than 180 days *only if all* the following conditions are met:

- The vehicle must be either self-propelled

or towable by a light duty truck. The hitch must remain on the vehicle at all times.

- The vehicle must NOT be attached to external structures such as decks and porches.
- The vehicle must be designed solely for recreation, camping, travel, or seasonal use rather than as a permanent dwelling.
- The vehicles largest horizontal projections must be no larger than 400 square feet.
- The vehicle's wheels must remain on axles and inflated.
- Air conditioning units must be attached to the frame so as to be safe for movement out of the floodplain.
- Propane tanks, electrical and sewage connections must be quick-disconnect and above the 100-year flood elevation.
- The vehicle must be licensed and titled as a recreational vehicle or park model.
- The vehicle must be either (a) entirely supported by jacks rather than blocks or (b) have a hitch jack permanently mounted, have the tires touching the ground, and be supported by blocks in a manner that will allow the blocks to be easily removed by use of the hitch jack.

Any recreational vehicles or travel trailers which do not meet **ALL** of these conditions, must be elevated to the flood protection elevation.

GARAGES AND SHEDS

Garages and sheds are considered "buildings" and therefore, must be regulated.

If a detached garage or shed is of minimal size and value (such as \$7500 and 500 square feet) and will be used simply for minor storage or parking, the structure could be "wet floodproofed" (see page 38). However, larger garages or storage buildings must meet the elevation or floodproofing requirements of the ordinance.

Attached garages can be constructed below the flood protection elevation, but must meet the conditions outlined in the section "Fully Enclosed Lower Area" (see page 36).

Any garage or shed which is to be located within a floodway (or a stream where the floodway has not been identified) and exceeds 70 square feet must be reviewed for state permit compliance.

SUBSTANTIAL IMPROVEMENT AND SUBSTANTIAL DAMAGE (THE 50% RULE)

Substantial Improvement

A substantial improvement is defined in the NFIP regulations as any repair, reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the "start of construction" of the improvement. The State Model Floodplain Ordinance also includes any addition which increases a floor area by more than 20% to this definition. Generally, structures are substantially improved in one of two ways:

1. rehabilitations or improvements that do not

affect the external dimensions of the structure;
or

2. additions that increase the square footage or market value of the structure.

The State Model Floodplain Ordinance requires that any development activity valued at over \$1,000 must meet the flood protection requirements. Although FEMA guidance is somewhat interpretive, the state has defined substantial improvement to mean that if the improvement or addition would increase the floor area of an existing building by more than 20% or increase the market value by 50%, the entire structure (not just the improvement) must be brought into compliance with the flood protection requirement (i.e. elevated or floodproofed).

In certain situations, the State of Illinois may not allow additions in the floodway.

Any substantially improved structure must be brought into compliance with NFIP requirements for new construction; in other words, it must be elevated (or floodproofed if it is a non-residential structure) to the flood protection elevation.

When a structure is substantially improved, the structure is considered a new “post-FIRM” structure, and actuarial flood insurance rates would apply based on the lowest floor elevation of the structure.

Long-term Improvements and Cumulative Improvements

Often times, improvements are made to a building over a long period of time. Although none of the individual improvements may meet

the substantial improvement definition, the sum of the improvements may. While FEMA has not provided clear regulations for this type of situation, recommendations have been provided. Each permit applicant should be made fully aware of the “substantial improvement” regulations. The administrator should record the cumulative percentage of improvements granted on each structure. When the total equals or exceeds half of the market value of the structure when the first improvement began, no additional permits should be granted unless the entire structure is brought into compliance with the floodplain regulations.

Substantial Damage

A building is considered substantially damaged when it sustains damage from any cause (fire, flood, earthquake, etc.), whereby the cost of fully restoring the structure would equal or exceed 50% of the pre-damage market value of the structure.

The cost to repair must be calculated for full repair to “before damage” condition, even if the owner elects to do less. The total cost to repair includes both structural and finish materials as well as labor.

A substantially damaged building which is repaired must be brought into compliance with the NFIP requirements for new construction; in other words, it must be elevated (or floodproofed if it is a non-residential structure) to the flood protection elevation.

Conducting post-flood damage assessments are a major component of a Floodplain Manager’s job. Should major flooding occur, Local Officials are encouraged to contact

IDNR/OWR immediately. (See Following a Flood on p. 46). Properly regulating the Substantial Damage provisions of the local ordinance will ensure that future flood losses are reduced.

Repetitive Losses / Cumulative Substantial Damage

IDNR/OWR strongly recommends that communities adopt a cumulative provision to track repetitive flood losses. With this language, a community tracks multiple flood losses. At the point where a structure has suffered damages that equal or exceed 50% of the original market value (substantial damage), the structure must be brought into compliance with the flood protection requirements. If the property owner carries flood insurance, the Increased Cost of Compliance coverage on standard NFIP policy will include up to \$30,000 to floodproof, elevate, relocate or demolish the structure (see "Increased Cost of Compliance" on page 8).

The state model floodplain ordinance includes cumulative damage language.

FEDERAL AND STATE FUNDED FLOODPLAIN DEVELOPMENT ACTIVITIES

Both the Federal government and the State of Illinois have Executive Orders which regulate construction in floodplain areas. The Federal Executive Order is #11988. The State Executive Order on Floodplain Management is E.O. 5 (2006).

In brief, these Executive Orders require that Federal or State agencies which plan, promote, regulate, or permit activities, as well

as those which administer grants or loans in the State's floodplain areas, must ensure that all projects meet the standards of both the state floodplain regulations and the National Flood Insurance Program (NFIP).

These standards require that new or substantially improved buildings as well as other development activities be protected from damage by the 100-year flood. Critical facilities must be protected to the 500-year flood level. In addition, no construction activities in the floodplain may cause increases in flood heights or damages to other properties.

These rules apply to such activities as university buildings, IDOT roads, bridges and filling activities, construction grants for schools, libraries, hospitals, and nursing homes, park districts and school districts, State and Federal office facilities and State or Federal flood control projects.

Chapter 6

Other Regulated Activities

“DEVELOPMENT”

The definition of floodplain development goes far beyond the traditional building permit system most communities have in place. Floodplain development regulations apply to both buildings and activities or alterations to the landscape that might affect flow patterns or the flood carrying capacity of a watercourse. In addition to the building and construction activities discussed in Chapter 5, floodplain “development” also includes:

- installation of utilities, construction of roads, bridges, culverts, and similar projects;
- construction or erection of levees, dams, walls, and fences;
- drilling, mining, filling, dredging, grading, excavating, paving, and other alterations of the ground surface;
- storage of materials including the placement of gas and liquid storage tanks;
- channel modifications and;

*any other activities that might change the direction, height, or velocity of flood or surface waters.

All of these other “development” activities can and do increase flood damages. They should be reviewed closely by the local permit official..

EXEMPTED ACTIVITIES

Theoretically, every shovelful of dirt moved in a floodplain will affect the flow of water. However, regulations which prevent even the smallest development would be both unfair and unreasonable. Accordingly, the Illinois Department of Natural Resources, Office of Water Resources recommends that certain insignificant activities be exempted from local floodplain regulations. These exemptions include:

*Buildings and additions equal to or less than 70 square feet in floor area (tool sheds, animal shelters, porches, etc.);

*Resurfacing existing roads;

*Minor maintenance of existing buildings or facilities; and

*Gardening, plowing, and similar practices that do not involve a change in the ground surface elevation.

SUBDIVISION PLATS AND OTHER MAJOR LAND USE PROPOSALS

When planning, communities should take into account flood hazards, to the extent they are known, in all official actions related to land management, land use and development.

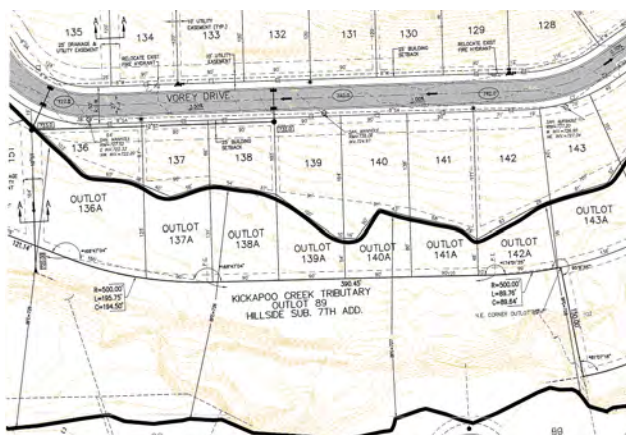
Proposed subdivisions, manufactured home parks, annexations, planned unit developments, and additions must meet all the floodplain development requirements of the National Flood Insurance Program (NFIP). Any development proposals greater than 5 acres or 50 lots must include base flood elevations and floodway delineations. These lines should be shown clearly on the plat or

plan. If a base flood elevation does not exist for the site, then the developer must provide it. Building sites should be located outside of the identified floodplain

The development proposal must also include a signed statement by a Registered Professional Engineer that the plat or plan accounts for any changes in the drainage of surface waters in accordance with the Illinois Plat Act, 765 ILCS 205/2 (State Bar Edition).

***special note on walkout basements:**

Subdivision plats should be reviewed closely when lots border a stream or river. Residential lots which border floodplain areas are frequently used for the construction of walkout basements. Although the footprint of the structure may be located outside of the mapped floodplain or above the flood elevation, walkout basements are frequently excavated out of the bluff side and therefore, subject to flood damage. In essence, the floodplain is excavated back to the structure. Construction plans for these types of structures, should be reviewed closely and walkout basements constructed high enough to avoid flood damage.



FENCES, LEVEES AND WALLS

When located in a floodplain, an innocent-looking fence can easily become clogged with debris during a flood and create an obstruction to flood flows thereby increasing flooding on neighboring properties. Levees and walls may also impact flood flows and increase damages on others. For this reason, fences, levees and wall should always be reviewed for floodplain permit compliance.

When reviewing these development activities, the local official should perform a site inspection and determine if the fence, levee, or wall will create an obstruction to flood flows. Site specific issues such as the location of the fence (parallel or perpendicular to flows), ground topography, local drainage issues, and the location of neighboring property should all be considered. If the fence, levee, or wall is located or extends into a Floodway (or a floodplain area with no mapped floodway), state permit review is required prior to the local permit review.

DAMS

IDNR/OWR regulates the construction and maintenance of dams within the state. The State of Illinois issues permits for the construction, operation and maintenance of new dams and the operation and maintenance of dams which existed prior to September 2, 1980. Dams are classified by the state based on both size and hazard potential. A large dam with residential housing



downstream will be classified at a greater risk than a small rural farm pond dam with no downstream housing. There are three hazard classifications. All dams in the two higher classifications are required to have a permit under these rules. Dams in the lower hazard classification require a permit for construction or modification if they meet certain size criteria. Anyone proposing to construction a new dam is recommended to submit a preliminary design report to the state as early as possible. Contact IDNR/OWR for further guidance.

FILL

By nature, floodplains are low-lying areas which seem to invite filling activities. Filling is included under the NFIP definition of “development” and therefore requires a floodplain development permit. If the filling is proposed in a floodway (or in a floodplain where no floodway has been identified), state permit review is required. When a local official is reviewing a permit application for filling, care should be taken to ensure that the fill will not alter drainage or divert flood water to other properties.

STORAGE OF MATERIALS INCLUDING GAS AND LIQUID STORAGE TANKS)

Materials stored in the floodplain can have the same effect as fill during a flood event. They can alter or divert flood flows and damage neighboring property.

If the materials are buoyant (such as lumber, propane tanks, storage tanks, ammonia tanks, etc.) and are not properly anchored, these items can become floating debris that may strike buildings or plug bridge openings

causing increased flood damages. Such hazards must be carefully considered in the permit review process.

Storage tanks located in a floodplain should be anchored and properly elevated above the flood protection elevation. If they cannot be elevated, a storage tank must be certified as floodproofed by a Registered Engineer. If floodproofed, the local official should maintain a Floodproofing Certificate on file for each tank. In addition, any openings on the tank should be watertight to avoid contamination during a flood.

HAZARDOUS MATERIALS

Increased flood heights are not the only flood related hazard that can be created by floodplain development. The model ordinance prohibits the placement of chemicals, explosives, buoyant materials, and other hazardous materials below the flood protection elevation unless they are properly elevated or floodproofed. It may be wise to completely prohibit certain hazardous materials in the floodplain. Two lists of hazardous materials have been developed by the U.S. Army Corps of Engineers:

Items that are extremely hazardous or vulnerable to flood conditions that should be prohibited from the floodplain:



Acetone
 Ammonia
 Benzene
 Calcium Carbide
 Carbon Disulfide
 Celluloid
 Chlorine
 Hydrochloric Acid
 Hydrocyanic (Prussic) Acid
 Magnesium
 Nitric Acid
 Oxides of Nitrogen
 Phosphorous
 Potassium
 Sodium
 Sulfur

Items that are sufficiently hazardous or vulnerable to recommend their prohibition in all spaces below the flood protection elevation:

- Acetylene gas containers
- Drugs (in quantity)
- Food Products (potential health problems)
- Gasoline
- Charcoal, coal dust (subject to spontaneous combustion when wet)
- Matches and sulfur products (in quantity)
- Petroleum products
- Soaps and detergents (in quantity)
- Tires (in open storage)
- Wood products (in quantity)

OTHER DEVELOPMENTS

As mentioned, anything that alters the natural topography of the floodplain is considered “development.” This includes such items as culverts, bridges, grading, paving, mining, land alterations, etc. Although often difficult for local officials to regulate, these smaller developments

should be reviewed. Though they may seem trivial, these items can increase flood heights. Serious consideration should be given to all floodplain developments prior to the issuance of a permit. For example, a chain link fence erected in a floodplain could fill with debris and block flood flows increasing flood heights upstream. Note that fences in the floodway are not allowed except for recreational fences parallel to flood flows or if required for an appropriate use. Serious consideration should be given to all floodplain development prior to the issuance of a permit.

FOLLOWING A FLOOD

Following a flood disaster, many communities are caught unaware of their post-flood responsibilities. The definition of floodplain “development” includes the repair or reconstruction of a substantially damaged structure (see p. 41). Buildings which have been damaged by flooding may fall under the substantial damage requirements. The local administrator must ensure that the repair of a damaged structure meets the floodplain permit requirements.

Following a flood, the local administrator should follow these five steps:

Step 1: Contact the Illinois Department of Natural Resources /Office of Water Resources (IDNR/OWR) or the Federal Emergency Management Agency (FEMA) Explain that you want guidance on damage assessments and permit requirements for flood damaged structures.

Step 2: Identify those structures believed to be substantially damaged and begin doing damage assessments.

Local officials should tour flooded areas and identify every structure which has a water mark and obvious structural damage. Manufactured homes can be substantially damaged with as little as one foot of flooding. Damaged buildings should be marked on a map of the community for future reference.

Damage assessments can be difficult. Local officials should inspect every flood damaged building and calculate the cost of repairs. An easy-to-use worksheet is available to help make these determinations. FEMA has developed a computerize program called the Substantial Damage Estimator (or SDE). This program has been used extensively by local officials across the nation and provides quick and accurate damage assessments. IDNR/OWR or FEMA can provide training on using the SDE. If available, insurance adjuster estimates can also be used to document the extent of flood damage. The pre-flood market value of every flooded structure can quickly be estimated from the County Assessor's records.

Again, IDNR/OWR and FEMA can assist the local official during the damage assessment process.

Step 3: Post information for the public on the local ordinance requirements for obtaining permits for repairs and rebuilding.

This is best accomplished by posting notices directly on to the flood damaged structures. Often repairs begin on flooded buildings before the water even recedes from the structure. Therefore, it is very important that this step take place as soon as possible.

History shows that information normally spreads very fast among flood victims. Posted signs, flyers, notices on damaged structures, press releases, and letters mailed to individual owners can all be used for this purpose. Have a "Floodplain Development Permit Application" in hand and ready to distribute. Keep it simple.

Be prepared for residents who are angry that they cannot be making immediate repairs to their damaged structures.

Step 4: Provide technical information to residents on elevation and floodproofing techniques.

Before repairs begin on flood damaged structures is the perfect opportunity to ensure that similar flood damages do not occur again. If the flood event is a declared disaster, federal or state assistance is usually available to implement mitigation techniques. If the structure is substantially damaged and has a flood insurance policy, Increase Cost of Compliance (ICC) coverage is available to mitigate the structure (see page 8). Technical manuals and guidance are available from many government and private sources. Workshops can be presented in flooded communities to introduce flood victims to the various options available to them. IDNR/OWR and FEMA will help with these workshops.

Step 5: Implement a permit application procedure.

At this point the community should be on its way to enforcing the floodplain ordinance. Those structures identified as substantially damaged (more than 50% of the pre-flood market value) should be "red-tagged". Remember, in many cases, the NFIP policy

will pay to elevate or relocate a damaged structure (see page 8 - Increase Cost of Compliance). Permits should not be issued until the structure is brought into compliance with floodplain regulations. Those with less than 50% damage can be issued permits to repair. However, most communities now track cumulative damages, so residents should be made aware of this requirement.

Chapter 7

Mitigation Strategies For Flood Damage Reduction

While the focus of this manual is on floodplain regulation, this chapter is included at the end to provide the local floodplain administrator an overview of the many options available to reduce flood damages to existing structures.

In the simplest terms... floodplains are for floods. Flooding is a natural process and cannot be eliminated. The damage resulting from floods, however, can be minimized through wise flood hazard mitigation. Flood hazard mitigation is a term which is used to describe any management strategy that reduces the severity of flood disasters through the use of both structural and non-structural measures. Beginning in the 1930's, federal policy directed efforts towards preventing flood



damage by controlling the flow of water (ie: trying to keep floods away from people). This policy was implemented by the construction of structural modifications such as dams and levees. Although these efforts did provide protection for many previously vulnerable

areas, they did not reduce public expenditures for flood damages. The taxpayer costs for flood damages continue to rise annually.

In the mid 1960's there was a reassessment of national policy and the beginning of a shift to a more comprehensive approach to flooding. Rather than solely trying to prevent floods, the new policy recognized floodplains as an essential component to a natural process. Federal policy began to emphasize non-structural strategies to complement the existing structural components. It required greater involvement by local governments, put more attention on protecting the natural environment, and redistributed some of the financial burden of flood losses from the general public to those individuals who use or own flood prone property.

Mitigation refers to activities that lessen potential for future flood damages. Examples include elevating structures above the predicted flood level, enhancing the natural flood storage of a floodplain with retention basins or updating floodplain ordinances to reflect the most recent

The emphasis of federal flood policy has shifted from almost exclusive use of structural control measures to equal consideration of non-structural strategies. It is now recognized that a variety of mitigation approaches must be combined to fit the unique circumstances of any given situation. Local governments have the best opportunity to implement flood mitigation plans for their communities. They can analyze the community's unique flood problems, establish objectives, and implement the plan that will keep flood damages at a minimum.

NON-STRUCTURAL METHODS

Non-structural methods to reduce flood damages are those which do not depend on controlling or altering the flow of water. Non-structural methods emphasize controlling activities which could result in increased flood damages rather than trying to control the water. As a rule, non-structural methods are cheaper to establish and, when maintained, provide better long-term protection from flood damages.

Land Use Planning

The principal non-structural strategy for reducing flood damage is to effect better use of water and land resources. This goal is achieved through comprehensive planning for and management of floodplain areas. Land use planning can determine the best location for various types of development. Implementation then relies on regulations such as zoning ordinances, subdivision regulations, and health codes to ensure positive development practices.

Floodplain Regulations

Communities that participate in the National Flood Insurance Program (NFIP) are required to maintain and enforce floodplain regulations. The regulations do not prohibit development in the floodplain but rather are designed to ensure that existing and new development does not get flooded or cause increased flooding elsewhere.

Zoning

Most communities in NE Illinois have some form of zoning requirement. Those that do, can use their zoning authority to discourage

development in the floodplain. Flood prone areas could be zoned “recreational”, “open space”, or “natural areas”. Zoning can also control the density of development in an area by controlling lot size. Zoning ordinances can prevent the expansion of nonconforming uses and can incorporate options which would limit the reconstruction of structures in a floodplain following a loss.

Building Codes

Building codes are established to ensure safety through the regulation of building materials and building design. Unlike floodplain regulations, building codes are normally a uniform set of regulations which apply to the entire community regardless of location. However, some codes do include construction guidelines specific to flood prone areas. Many communities have adopted the International Building Codes (IBC) codes as their construction standards. Several sections of the International Codes (I-Codes) include floodplain construction guidelines. However, these codes DO NOT meet the Illinois specific floodway regulations. Therefore, the I-Codes must be amended or the community must adopt a stand-alone floodplain ordinance to meet Illinois’ more restrictive floodway regulations.

Subdivision Regulations

Subdivision regulations control the division of land. In the floodplain area, a subdivision plat must clearly identify the base flood elevation and ensure that all buildings and public facilities are located outside of the floodplain or protected from potential flood damage.

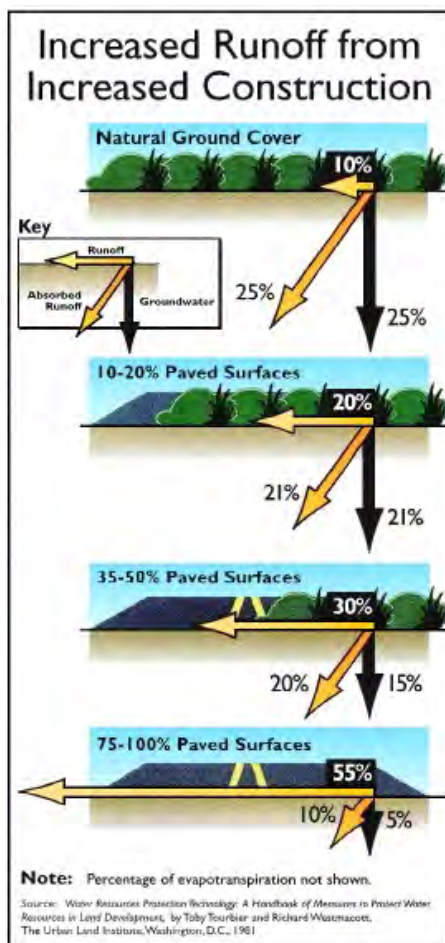
Many of the newer subdivisions in Illinois tend

to develop along streams. The roads and lots in these subdivisions follow the contour of the stream. Individual lots in these subdivisions have a building portion on the higher ground with the lot extending back to a stream. An increasingly popular subdivision design in these circumstances is to plat deed restricted "outlots" within the mapped floodplain areas. In other new subdivisions, the floodplain areas are platted as open space, natural areas, or recreational areas such as bike trails.

rapid growth and development. As undeveloped areas are replaced by parking lots, streets, and buildings, water flows into streams more quickly. These changes to a watershed can result in increased stormwater runoff and more frequent floods. Growing communities are encouraged to adopt and implement stormwater regulations to prevent:

*increases in downstream flooding due to new urbanization;

Stormwater Management



- increases in the magnitude and frequency of small flood events;
- increases in drainage-related damages due to inadequate design of local drainage systems;
- the loss of beneficial stream uses due to degraded stormwater quality; and
- the loss of beneficial stream uses due to adverse hydrologic and hydraulic impact of urbanization.

Most communities in NE Illinois currently have stormwater regulations set by either their county or a sanitary district.

Relocation and Acquisition



Development occurring outside of the floodplain can also impact flood flows. Many communities in NE Illinois are experiencing

Often times when structures are flood damaged on a repetitive basis, the best mitigation option is acquisition or relocation. Areas where the flood prone structures were located can be converted to uses less susceptible to flooding such as parking lots, parks, or natural areas. While moving a structure or purchasing a property can be expensive, in the long run it can be less expensive than long-term, repetitive flood damages. State and Federal programs are available in certain situations to assist a community in buying flood prone properties (see pages 57). The Illinois Emergency Management Agency (IEMA) coordinates the state's mitigation activities. The IEMA contact information can be found in the appendix of this manual.

Floodproofing

Floodproofing can be any combination of structural or non-structural changes or adjustments incorporated in the design, construction, or alteration of individual buildings or properties that will reduce flood damages. Flood insurance rates may also be reduced by these actions.

There are three general approaches to floodproofing existing structures:

1. Raising the structure so that floodwater cannot reach damageable portions of the building . When elevated, structures are normally jacked up and set on cribbing and a new or extended foundation is constructed underneath the structure. The elevation method (fill, stilts, blocks, or walls) is dependent on the condition of the building, the flood hazard, local floodplain regulations, and the owner's financial condition.

2. Constructing barriers to stop floodwater from entering the building. This method can be accomplished by erecting structures such as levees, floodwalls, berms, or ring dikes around a structure. In areas where flood waters are less than three feet, a flood prone structure can be retrofitted by coating the walls with waterproofing compounds or impermeable sheeting. Openings such as doors, windows, sewer lines, and vents are closed with permanent closures or removable shields, sandbags, valves etc.. A professional engineer should be consulted before dry floodproofing since the threat of collapse or damage from hydrostatic pressure is a major concern with this technique .

3. Modifying the structure and relocating the building contents to minimize flood damage. Relocating floodprone items can often greatly reduce overall flood damages. This method is dependent on adequate warning time and the action of someone who knows what to do. Considerations such as flood stage depth and rates are important considerations.

Purposely allowing areas that contain sources of electricity or hazardous materials to flood can also create a safety hazard. Lastly, because this method often times relies on flood waters entering the building, clean up after flooding should be a major consideration.

More detailed information on floodproofing and flood mitigation techniques can be obtained from the FEMA regional office, IDNR/OWR, or the Corps of Engineers.

STRUCTURAL METHODS

Structural methods were the traditional

response to flooding for many years. Methods such as levees, dams, and floodwalls attempt to control flood waters and keep flooding away from people. They can be effective in situations where prior development has occurred and flood flows are relatively predictable. However, structural methods are, as a rule, extremely expensive and the cost of construction must be justified by the amount of flood protection offered. In addition, if structural methods are not properly maintained, damages caused by failure can be severe. Structural methods can also provide a false sense of security and promote floodplain development. For these reasons, structural methods alone are often not the answer for effective flood mitigation.

Dams and Reservoirs

The purpose of flood control dams and reservoirs is to store flood waters until stream flows are lower and the water can be released gradually without flood damage. Reservoirs can often serve a multi-function purpose of providing recreation areas, natural areas, or hydroelectric power. As would be expected, dams and reservoirs are generally very expensive to construct.

Levees and Floodwalls

Levees and floodwalls contain or constrict floodwaters to the stream channel. As with other structural methods, levees and floodwalls can be very expensive to construct and the amount of protection offered must outweigh the cost of construction. Levees and floodwalls must also be maintained in order to ensure safety. Both levees and floodwalls are designed and constructed to protect against a designated protection level. If floodwaters

surpass that protection level, or if the levees fail, the results can be catastrophic.

Channel Modifications

Projects such as clearing brush, trees, and other obstructions can often be a simple, inexpensive method to reduce flooding. Projects such as straightening, removing bends, deepening or widening waterways can often reduce immediate flood damages. However, the benefits are often short-term since modified channels can quickly silt in. Also, these methods could increase velocities and flood damages downstream as well as result in adverse environmental impacts. Whenever a project such as this is proposed, a professional engineer should be consulted, and state and federal regulatory agency review is generally required.

Watershed Improvements

In many areas of NE Illinois (especially urbanized areas with increased impervious surfaces), stormwater runoff can impact flood flows. Watershed treatments such as tiling, terracing, vegetative cover, buffer zones, and grassed waterways can delay runoff to the stream channel. Watershed improvements can also reduce erosion and improve stream water quality. The U.S.D.A. Naturalization and Resource Conservation Service and the local Soil and Water Conservation District can provide assistance and, in some cases, funding for watershed treatment projects.

POST FLOOD MITIGATION PROGRAMS

Most flood mitigation projects are undertaken in the wake of a flood disaster. However, mitigation planning should IDEALLY begin

before the flood event. A community should prepare a mitigation plan that identifies the area of risk including individual structures and outline an appropriate response. This will allow your community to make informed and thoughtful decisions prior to the chaos and confusion that often exists during the flood fight and recovery process. Several mitigation programs are available to help flood victims. These programs are all developed to reduce flood losses and minimize the chance of future flood losses.

Hazard Mitigation Grant Program (HMGP)

HMGP is activated following a Presidentially declared disaster. HMGP funds are based on 15% of the Federal Funds spent on the Public and Individual Assistance (disaster assistance) programs for each disaster. Using this program, the State of Illinois has spent close to \$100 million dollars and has acquired over 3,000 flood prone properties in the past ten years.

Individual homeowners and businesses may not apply directly to the program; however a community may apply on their behalf. Projects must provide a cost-efficient long-term solution to a problem. For example, buyout of properties that have been subjected to repetitive flood damage are a priority over buying sandbags and pumps to fight the flood. Non-structural solutions are the priority in Illinois; but HMGP funds have, in rare cases, been used for specific structural solution to flooding.

In order to qualify for an HMGP project, a local mitigation plan is required. The Illinois Emergency Management Agency (IEMA) helps communities prepare mitigation plans

which meet all project approvals.

Flood Mitigation Assistance Program (FMAP)

This program provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP).

There are three types of grants available under FMA:

1. Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA
2. Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses.
3. Technical Grants. Ten percent of the Project Grant is made available to States as a Technical Assistance Grant. These funds may be used by the State to help administer the program.

Predisaster Mitigation Program (PDM)

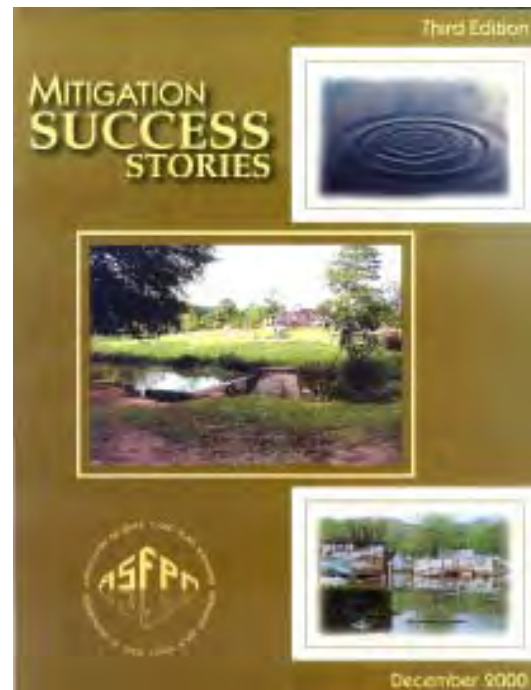
This is a program that provides funding for mitigation projects and planning. These program funds are typically used towards the acquisition of floodprone property.

Public Assistance

Following a Presidentially declared disaster Public Assistance funds are provided to assist declared jurisdictions in repairing the damaged infrastructure. These funds are not designed to provide complete recovery...only immediate recovery needs. Flood Insurance and other mitigation programs are needed to recover from a flood disaster. If it is cost effective, additional funds may be contributed to mitigate against future damage to the infrastructure.

Increased Cost of Compliance (ICC)

The standard NFIP policy includes up to \$30,000 to floodproof, elevate, relocate or demolish the structure. This mitigation option is only available to those homeowners who carry flood insurance. To be eligible, the structure must be substantially damaged by a one time or multiple flood events. However, a community must adopt a repetitive loss provision in the local ordinance to be eligible for ICC based on multiple losses. (See page 8, Increased Cost of Compliance).



Chapter 8

Community Rating System

BACKGROUND

Since the National Flood Insurance Program (NFIP) was organized in 1968, the program has been successful in requiring new buildings to be protected from damage by the 100-year flood. However, the program had few incentives for communities to do more than enforce the minimum regulatory standards. Flood insurance rates had been the same in all participating communities, even though some do much more than regulate construction of new buildings to the national standards. Initially the program did little to recognize or encourage community activities to reduce flood damages to existing buildings, to manage development in areas not mapped by the NFIP, to protect new buildings beyond the minimum NFIP protection level, to help insurance agents obtain flood data, or to help people obtain flood insurance. Because these activities can have a great impact on the insurance premium base, flood damages, flood insurance claims, and federal disaster assistance payments, the Federal Insurance Administration (FIA) has implemented the Community Rating System (CRS).

THE CONCEPT

Experience since the turn of the century has shown that the fire insurance public protection class given to a community has been a very strong incentive for local officials to maintain or improve their fire protection programs. Local governing boards ensure that their fire alarm communications, water supply and distribution, and overall fire department facilities, including staffing, equipment,

training, and other items meet or exceed the insurance industry's minimum criteria in order to maintain favorable fire insurance rate classes for their communities. The CRS was established to encourage, by the use of flood insurance premium adjustments, community and state activities beyond those required by the NFIP to:

- reduce flood losses;
- facilitate accurate insurance rating; and
- promote the awareness of flood insurance.

COMMUNITY CLASSIFICATION

Flood insurance premium credits are available in communities based on their CRS classification. There are ten classes with Class 1 having the greatest premium credit (45%) and Class 10 having no premium credit. A community's CRS class is based on the number of credit points calculated for the activities that are undertaken to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. A community is automatically a Class 10 unless it applies for CRS classification and shows that the activities it is implementing warrant a better class. The amount of premium credit for each class is published annually by FIA.

The CRS rewards those communities that are doing more than the minimum NFIP requirements. The system also provides an incentive for communities to initiate new flood protection activities.

OPERATION

Community application for CRS classification is voluntary. Any community in full compliance with the rules and regulations of the NFIP may

apply for a CRS classification. The applicant community submits documentation that it is implementing one or more of the activities recognized in the CRS Schedule.

The Schedule identifies 18 creditable activities, organized under four categories in Sections 300-600: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. The Schedule assigns credit points based on how well an activity affects the three goals of the CRS. Communities are welcome to propose alternatives in their applications. Some activities may be implemented by the state or regional district rather than at the local level. For example, Illinois has dam safety regulations that meet the credit criteria of activity 630-Dam Safety. Any community in Illinois receives Dam Safety credit points if the community applies for a CRS classification.

The Regional Office of FEMA and the Illinois Department of Natural Resources/ Office of Water Resources (IDNR/OWR) review and comment on the application. FIA verifies the information and the community's implementation of the activities. FIA sets the credit to be granted and notifies the community, the state, the insurance companies, and other appropriate parties.

The community's activities and performance are reviewed periodically. If it is not properly or fully implementing the credited activities, its credit points and, possibly, its CRS classification will be revised. A community may add or drop creditable activities each year. Credit criteria for each activity may also change as more experience is gained in implementing, observing, and measuring the activities.

COSTS AND BENEFITS

No fee is charged for a community to apply for classification or to participate in the CRS. Because there may be a cost to implement the creditable activities, some communities may be concerned whether the cost of initiating a new activity will be offset by the flood insurance premium credits.

It is important to note that reduction in flood insurance rates is only one of the benefits communities receive from undertaking the activities credited under the CRS. Others include increased public safety, reduction of damages to property and public infrastructure, avoidance of economic disruption and losses, and protection of the environment. Communities should prepare and implement those activities that best deal with the local flood problem, not just those items that are listed in the Schedule. In considering whether to undertake a new activity, communities will want to consider all of the benefits the activity will provide (in addition to insurance premium credits) in order to determine whether it is cost effective.

ACTIVITIES CREDITED

- 300 PUBLIC INFORMATION ACTIVITIES
- 310 Elevation Certificates:
Maintain FEMA's Elevation Certificate and make copies available to inquirers.
- 320 Map Determinations:
Respond to inquiries for Flood Insurance Rate Map zone and flood data.
- 330 Outreach Projects:
Advise residents about the flood hazard, flood insurance measures.

- 340 Hazard Disclosure:
Advise potential purchasers of flood prone property about the hazard.
- 350 Flood Protection Library:
Maintain and publicize a library and/or community website of references on various flood-related topics.
- 360 Flood Protection Assistance:
Provide technical advice and/or assistance to property owners desiring to protect themselves from flooding.
- 400 MAPPING AND REGULATORY ACTIVITIES
- 410 Additional Flood Data:
Develop floodplain maps, elevations, or other flood data where none exists.
- 420 Open Space Preservation:
Keep vacant floodplain areas free from buildings and filling.
- 430 Higher Regulatory Standards: Require new development to be protected to a level greater than the NFIP minimum regs.
- 440 Flood Data Maintenance:
Make the community floodplain maps more current, useful, or accurate.
- 450 Stormwater Management:
Regulate new development throughout the watershed to minimize their impact on surface drainage and runoff.
- 500 FLOOD DAMAGE REDUCTION ACTIVITIES
- 510 Repetitive Loss Projects:
Develop and implement a plan to mitigate losses in repeatedly flooded areas.
- 520 Acquisition and Relocation:
Purchase or relocate buildings and convert flood-prone properties to open space.
- 530 Retrofitting:
Floodproof, elevate, or modify existing buildings to protect them from flood damages.
- 540 Drainage System Maintenance:
Conduct regular inspections and maintain the capacities of channels and retention basins.
- 600 FLOOD PREPAREDNESS ACTIVITIES
- 610 Flood Warning Program:
Provide early flood warning to the general public and special facilities.
- 620 Levee Safety:
Maintain levees and emergency response plans for them.
- 630 Dam Safety:
At the state level, regulate the construction and maintenance of dams. (Illinois does have an approved program.)
- More information or an application for the CRS program can be obtained from the FEMA Regional Office or from IDNR/OWR.

APPENDICES

Glossary

A-Zone: See “Zone A”.

Anchoring: Special connections made to ensure that a building will not float off or be pushed off its foundation during a flood. Anchoring must also ensure that the structure will not be dislodged by debris.

Appeal: A request to higher authority such as a Board of Appeals or a City Council to overrule a permit denial because the applicant claims that the ordinance has been incorrectly interpreted.

Area of State Concern: That portion of floodplains where state permits are required. Communities that do not have identified floodways but do have floodplain areas where significant development pressure is occurring may ask IDNR/OWR to prepare an Area of State Concern Map for them.

Base Flood: The flood having a one percent chance of being equaled or exceeded in any given year (often called the 100-year or one percent chance flood)

BFE (Base Flood Elevation): The elevation of the crest of the base (or 100-year) flood.

Basement: Any fully enclosed area of a building below grade on all sides.

Best Available Data: The most recent hydraulic and hydrologic information to show what the 100-year flood elevations and floodplain boundaries are for a particular area. Typically, the best available data is obtained from a federal, state, or local source. In Illinois, the Illinois State Water Survey is the best source for this type of data.

Building: A structure that is principally above ground and is enclosed by walls and a roof including manufactured homes and prefabricated buildings. The term also includes recreational vehicles and travel trailers which are permanently installed on a site for more than 180 days.

Building Official: The person responsible for administering and enforcing a community’s floodplain ordinance. Depending on the local ordinance, this person could be the city engineer, zoning administrator, building inspector, mayor, clerk, or other official.

CFR: Code of Federal Regulations. A master coding system to identify the federal agency regulations that have been published in the Federal Register. 44 CFR

includes all the regulations published by the Federal Emergency Management Agency.

Crawlspace: An enclosed area below the lowest elevated floor. By FEMA definition, a crawlspace cannot exceed 4 feet in height of which only 2 feet can be subgrade. The area must also have permanent openings and an interior drainage system.

Critical Facility: Any public or private facility which, if flooded, would create an added dimension to the disaster or would increase the hazard to life and health. Examples are public buildings, emergency operations and communications centers, health care facilities and nursing homes, schools, and toxic waste treatment, handling or storage facilities.

Cross Section: Survey information that records the dimensions of a channel and floodplain at right angles to flow.

CRS (Community Rating System): A program of the Federal Insurance Administration where communities who regulate floodplain areas above and beyond minimum NFIP requirements are rewarded for their efforts through reduced flood insurance premiums for the citizens of that community.

Datum: A point of reference used to insure that all elevation records are properly related. Many communities had their own datum developed before there was a national standard. All flood insurance studies currently use National Geodetic Vertical Datum (NGVD) .

Development: Any man-made change to the ground that may affect flood flows. Development includes buildings, filling, channel changes, dredging, grading, excavating and storage of materials. A detailed description of development is found in Chapter 6 of this manual.

Discharge: The amount of water that passes a point. Discharge is usually measured in cubic feet per second. For flood studies the peak flood discharge is the greatest amount of water that will pass a point at the crest of the flood.

Elevation Certificate: A form supplied by the Federal Emergency Management Agency (FEMA) and used to document the lowest floor elevation of a building.

Federal Register: A daily publication of the federal government used to publicize federal agencies’ rules.

FEMA: Federal Emergency Management Agency. FEMA is the federal Agency which administers the NFIP.

FHBM: See “Flood Hazard Boundary Map”.

FIA: Federal Insurance Administration. FIA is the part of FEMA which is responsible for the NFIP.

FIRM: See “Flood Insurance Rate Map”.

FIS: Flood Insurance Study. A booklet which provides detailed information on a community’s flood hazard areas. The FIS normally includes topographic information, floodplain and floodway data charts, study information, and stream profiles.

Flood Hazard Boundary Map (FHBM): An approximate NFIP map produced for communities that are not in the regular program or communities that have limited development potential.

Flood Insurance Rate: The map provided to communities in the Regular Phase of the NFIP. It delineates a Special Flood Hazard Area or floodplain where regulations apply. FIRMs often provide the base flood elevations at specific sites.

Flood Mitigation Assistance Program (FMAP) - A FEMA program available to produce mitigation plans and help mitigate the structures from future flood losses.

Floodplain: Land areas subject to flooding.

Floodproofing: Protection measures made to a building that is not elevated above the flood level to ensure that floodwaters do not damage it. Dry floodproofing consists of ensuring that the walls and floor are watertight and capable of withstanding hydrostatic pressures and hydrodynamic forces. Wet floodproofing permits water to enter the building and seek its own level to alleviate hydrostatic pressure.

Floodway: The channel of a river and the portion of the floodplain that carries most of the flood. Regulations require that the floodway be kept open so that flood flows are not obstructed or diverted onto other properties.

Floodway Data Table: The table provided in the flood insurance study which provides detailed information for each cross section on streams studied in detail.

404 Permit: A permit required by Section 404 of the Clean Water Act to protect rivers and adjacent wetlands from being filled. This permit program is administered by the U.S. Army Corps of Engineers.

FPE: Flood Protection Elevation. The elevation to which a building must be protected from flood damage through elevation or floodproofing. In Illinois, the FPE is usually the 100 year flood elevation plus one foot of

additional freeboard. Communities are encouraged to adopt higher flood protection elevations where appropriate.

Flood Fringe: The part of the floodplain outside of the floodway. State permits are not required for development in flood fringes.

Freeboard: An extra margin of safety added to the base flood elevation to protect structures from waves, debris, or other unpredictable hazards that accompany the base flood. The base flood elevation plus the freeboard equals the flood protection elevation.

Hazard Mitigation Grant Program (HMGP): A FEMA program available to communities following a federally declared disaster to help mitigate structures from future flood losses. HMGP typically pays 75% of the costs associated with mitigation projects. State or local governments provide the matching 25%.

Hydraulics: The study of moving water. The hydraulic analysis in a flood insurance study calculates how high and how fast a flood discharge flows.

Hydrodynamic Forces: The forces on a structure from current, waves, debris, ice, etc.

Hydrology: The science dealing with the waters of the earth. A hydrologic study calculates flood discharges.

Hydrostatic Pressure: The pressure standing water places on the walls and floor of a structure. Hydrostatic pressure of 3-4 feet of standing water can collapse walls or buckle basement floors.

IDNR/OWR: Illinois Department of Natural Resources/ Office of Water Resources.

ILCS: Illinois Compiled Statutes.

Increased Cost of Compliance (ICC): A FEMA program available to individual insurance policy holders after a flood claim to help mitigate the structure from future flood losses. Up to \$30,000 of ICC funds can be used to floodproof, relocate, elevate, or demolish a flood damaged structure.

LOMA: Letter of Map Amendment. A LOMR typically involves a parcel of land with is naturally higher (no fill) than the base flood and was inadvertently included in the floodplain. FEMA will issue a LOMA for a structure or parcel of land, thereby waiving the mandatory flood insurance purchase requirements of most lending institutions.

LOMR: Letter of Map Revision. FEMA will issue a LOMR when changes to the effective floodplain map such as floodplain boundaries, floodway or base flood

elevations have been made. A LOMR typically involves some sort of physical modification of the floodplain.

Lowest Floor: The lowest floor of the lowest enclosed area (including basement) of a building. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor provided such enclosure is built in accordance with the floodplain ordinance.

NFIP: National Flood Insurance Program.

NGVD: National Geodetic Vertical Datum; the national datum used by the National Flood Insurance Program. NGVD is based on mean sea level and also has been called "1929 Mean Sea Level."

Ponding: A flooding condition caused when rain runoff drains to a location that has no ready outlet. Ponding water usually stands until it is able to seep into the ground. Ponding is a common problem in leveed areas, flat areas, and in communities where construction of streets and other development has blocked the natural outlets.

Profile: A graph showing the water surface elevations of a flood at any particular location along the stream.

"Q": An abbreviation used by engineers to stand for discharge.

Recreational Vehicle (R.V.): Means a vehicle which is:

- (a) built on a single chassis;
- (b) 400 square feet or less when measured at the largest horizontal projection;
- (c) designed to be self-propelled or permanently towable by a light duty truck; and
- (d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Repetitive Loss: Flood related damages sustained by a structure on two separate occasions during any ten year period for which the cost of repairs at the time of each such flood event on the average equals or exceeds 25% of the market value of the structure before the damage occurred.

Registered Professional Engineer: An engineer who has been tested and registered by the Illinois Department of Registration and Education.

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels and are

regulated differently than floodplains caused by ponding, sheet flow or lake shore flooding.

SFHA: Special Flood Hazard Area. The term used by the National Flood Insurance Program for the floodplain identified on the flood insurance maps.

Section 1316: A section in the National Flood Insurance Act of 1968 that authorizes local officials to request that FIA deny flood insurance coverage on a building built contrary to a local ordinance.

Substantial Damage: Damage of any origin (flood, fire, earthquake, etc.) 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. Many communities track these damages cumulatively.

Substantial Improvement: Means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" or the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. If a building is substantially improved, then the entire building must be protected from the base flood.

Topographic Map: A map showing elevation contour lines.

Travel Trailer: See "Recreational Vehicle"

Uplift: Hydrostatic pressure placed on a floor as water below the floor tries to rise.

Use Permit: A permit issued after a development project is complete and the property has passed all the necessary inspections. Depending on the local ordinance provisions, a building cannot be occupied nor can a site be used unless a use permit or a certificate of use and occupancy is issued by the building official.

Variance: A request to be relieved of one or more ordinance requirements because the ordinance affects the property in a unique and special way.

Zone A: The 100-year floodplain as shown on NFIP maps. There are five types of A Zones: A Floodplains where no base flood elevation data is provided. AE Floodplain where base flood elevations are provided. A# Numbered A zones (e.g. A7 or A14), riverine floodplains where a flood insurance

study has provided base flood elevations. AO Floodplain with sheet flow or shallow flooding, base flood depths are provided.

AH Floodplain characterized by shallow ponding, base flood depths are provided.

Zone B: The area depicted on Flood Insurance Rate Maps as between the limits of the 100-year and 500- year floods. As a rule, B-zones are not regulated in Illinois. B zones do not appear on newer floodplain maps.

Zone C: Areas of minimal flooding located outside of both the 100-year and 500-year flood zones. C zones do not appear on newer floodplain maps.

Zone X: Areas determined on newer floodplain maps to be outside of both the 100-year and 500-year flood zones (used instead of C-zones on newer FEMA maps)

(SAMPLE)

APPLICATION FOR PERMIT

TO DEVELOP IN A FLOODPLAIN AREA

The undersigned hereby makes application for a permit to develop in a designated floodplain area. The work to be performed is described below and in attachments hereto. The undersigned agrees that all such work shall be done in accordance with the requirements of the Floodplain Ordinance and with all other applicable local, state, and federal regulations. This application does not create liability on the part of the _____ or any officer or employee thereof for any flood damage that results from reliance on this application or any administrative decision made lawfully thereunder.

Owner's Name: _____ Builder's Name: _____
Address: _____ Address: _____
Telephone # _____ Telephone # _____

A. DESCRIPTION OF WORK. COMPLETE FOR ALL WORK.

1. Proposed Development Description:

_____ New Building _____ Manufactured Home _____ Improvement to Existing Building _____ Filling _____ Fence
_____ Other (describe) _____

2. Size and location of proposed development (attached drawing):

3. Is the proposed development in an identified floodway (or floodplain with no identified floodway)?

Yes _____ No _____

4. If yes, has a state permit been obtained and attached?

Yes _____ No _____

5. As identified on the floodplain map what is the zone and panel number of the area of the proposed development?

Zone _____ Panel # _____

B. COMPLETE FOR NEW BUILDINGS ONLY:

1. Base Flood Elevation at site? _____ feet m.s.l.

2. Required Lowest floor elevation (including basement)? _____ feet m.s.l.

3. Elevation to which all attendant utilities, including all heating and electrical equipment will be protected from flood damage.
_____ m.s.l.

C. COMPLETE FOR ALTERATIONS, ADDITIONS, OR IMPROVEMENTS TO EXISTING STRUCTURES ONLY:

1. What is the estimated market value of the existing structure? \$ _____

2. What is the cost of the proposed construction? \$ _____

3. If the cost of the proposed construction equals or exceeds 50% of the market value of the structure or 20% of the total floor area, then the substantial improvement provisions shall apply.

D. COMPLETE FOR NON-RESIDENTIAL FLOODPROOFED CONSTRUCTION ONLY:

1. Type of floodproofing method?

2. If the structure is floodproofed the required floodproofing elevation is _____ feet m.s.l.

3. Certification by registered professional engineer or architect attached? Yes _____ No _____

E. COMPLETE FOR SUBDIVISIONS AND PLANNED UNIT DEVELOPMENTS ONLY:

1. Will the subdivision or other development contain 50 lots or 5 acres? Yes _____ No _____

2. If yes, does the plat or proposal clearly identify base flood elevations? Yes _____ No _____

Applicant's Signature _____ Date _____, 20 _____

ADMINISTRATION

1. Permit fee \$ _____ Paid _____, 20 _____

2. Permit issued _____, 20 _____

3. Work inspected by _____ Date _____, 20 _____

4. Certificate of compliance for as-built lowest floor elevation issued on _____, 20 _____

Elevation Certificate attached? Yes _____ No _____

As-Built Lowest Floor Elevation _____ - feet m.s.l.

5. Permit denied _____, 20 _____

Reason

6. Local Administrator Signature _____

Date _____, 20 _____

LOCAL FLOODPLAIN PERMITTING PROCEDURES A STEP-BY-STEP GUIDE

STEP #1: IS IT FLOODPLAIN DEVELOPMENT?

Check to see if the project meets the definition of “development”

Development includes:

- construction, reconstruction, or placement of a building valued at over \$1,000;
- additions to existing buildings;
- substantial damage to existing buildings;
- substantial improvements to existing buildings
- manufactured homes
- travel trailers or RV’s on site for more than 180 days;
- drilling, mining, filling, dredging, excavating, paving or grading;
- construction or erection of levees, dams, walls, or fences;
- storage of materials (including gas or liquid storage tanks);
- any other activity that might change the direction, height, or velocity of flood waters.

Note As a general rule of thumb, anything which alters the natural topography of the floodplain needs a permit review. Development does not include: minor maintenance of existing buildings and facilities, resurfacing roads, gardening, plowing, and similar agricultural practices that do not involve filling, grading, or construction or levees or berms.

STEP #2: FLOODPLAIN DETERMINATION

Check to see if the development site is in the floodplain. Refer to the Flood Insurance Rate Map. If the project site is obviously outside of the shaded A-Zone, floodplain regulations do not apply. If the project site is within the shaded A-Zone or is a borderline question, move on to step #3.

STEP #3: FLOODWAY DETERMINATION

Check to see if the development site is in the floodway. Refer to the Flood Insurance Rate Map or Flood Boundary and Floodway Map for the community.

If the project site is obviously outside of the floodway, proceed to step #4

If the project site is within the floodway, is borderline, or is within a floodplain where floodways have not been delineated. STOP NOW! State permits are required prior to local permit review.

Have the applicant contact IDNR/OWR for permit guidance. Do not issue local permits until the applicant brings in verification that state review and approval has taken place.

Note Certain projects are authorized by IDNR/OWR Statewide Permits. These Statewide Permits provide construction criteria for specific projects. If the project meets the terms and conditions, no additional IDNR/OWR review is necessary. A complete listing of Statewide Permits can be found at www.dnr.state.il.us/owr/resman/permitprogs or by calling IDNR/OWR for information.

STEP #4: LOCAL PERMIT APPLICATION

Have the owner fill out a local permit application. A location or plat map of the site should be attached to every application. Plans of the proposed development should also be attached showing existing and proposed conditions, including all appropriate, measurement, dimensions and elevations.

STEP #5: BUILDINGS

Check to see if the project includes a new building, substantial improvement or substantial damage of an existing building.

A “building” is a structure that is principally above ground and is enclosed by walls and a roof including manufactured homes and prefabricated buildings. The term also includes recreational vehicles and travel trailers permanently installed on site. “Substantial Improvement” means any reconstruction, rehabilitation, addition, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started, “Substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either;

- any project for improvement of a structure to comply with existing state or local health, sanitary,

- or safety code specifications which are solely necessary to assure safe living conditions; or
- any alteration of a structure listed on the National Register of Historic Places or the Illinois Register of Historic Places. “Substantial Damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50% of the market value of the structure before the damage occurred regardless of actual repair work performed. Volunteer labor and materials must be included in this determination. Substantial damage is often tracked cumulatively.

If the project meets any of these definitions, proceed to step 6. If the project does not meet the definition of a building, proceed to step 9.

STEP 6: BASE FLOOD ELEVATIONS

Obtain the base flood elevation at the project site. Flood elevations can be obtained from several sources:

1. From the Flood Insurance Rate Map; or
2. From the Flood Profile in the Flood Insurance Study.

If these two sources do not exist:

3. Obtain the base flood elevation from a federal, state, or local source (commonly called “best available information”). In Illinois, the best source for this information is the Illinois State Water Survey. If there is no flood information available from these sources:
4. Require the applicant to hire an engineer and determine the base flood elevation.

A permit cannot be reviewed unless the flood protection elevation at the site is known.

STEP 7: LOWEST FLOOR ELEVATIONS

Review the construction plans to make sure that the lowest floor (including basement) of the proposed building is at or above the flood protection elevation. In most Illinois communities, the flood protection elevation is one foot above the base flood elevation. Building protection can be done by one of four methods:

1. Elevation on fill. This is the cheapest alternative if flood depths are relatively shallow. The following conditions must be met:

- the top of the fill must be at or above the flood protection elevation;
- the fill must be properly compacted;
- the fill must be protected from erosion and scour
- The fill must not cause drainage or flow on to neighboring properties.

2. Elevating on fully enclosed lower areas. This alternative is popular when flood depths are a bit higher and the owner wants to utilize the lower area. The following conditions must be met:

- materials used below the lowest floor are flood resistant;
- all electrical, heating, ventilating, plumbing and air condition equipment and utility meters must be located above the flood protection elevation;
- all water and sewer pipes, electrical and telephone lines located below the flood elevation are waterproof;
- all on-site waste disposal systems are designed to prevent discharge into flood waters;
- If walls are used, they must have permanent openings no more than one foot above grade (at least one square inch of openings for every square foot of enclosed area).
- the enclosed lower area can be used only for parking, minimal storage, or building access and not modified later into habitable space.

3. Elevating on stilts, piles, or poles. The alternative is necessary when flood depths are extreme or the structure is located within a floodway. In addition to all of the conditions listed above in #2, the following additional conditions must be met:

- the structure should be properly anchored to resist floatation or damage from flood velocity or debris.

4. Floodproofing. This is only an option for NON-RESIDENTIAL BUILDINGS. The plans for a floodproofed building must be prepared by a registered engineer who also must sign and seal the design. The certification must ensure that the structure will remain water tight (floodproofed) to at least the flood protection elevation. A FEMA Floodproofing Certificate is required.

Once you are satisfied that the design will meet the

ordinance requirements and that the building will be free from flood damage, the permit can be issued. Make sure that the plans and any other documentation are made part of the application and maintained in your records.

STEP #8: INSPECTIONS

Make site inspections to ensure that the project is built according to the permitted plans. Document the final as-built lowest floor elevation on either an NFIP Elevation Certificate or on a local elevation certification.

STEP #9: OTHER DEVELOPMENT ACTIVITIES

Other development activities must be designed so as not to alter flood flows or divert waters. Inspect the site and look at the development activity. Ensure that it will not cause increased flooding onto neighboring property. This is especially important if the activity involves filling, fences, wall, levees, or berms. If the activity includes any electrical components, ensure that they are elevated above the flood protection elevation.

STEP #10: MAINTAIN RECORDS

Maintain all records...even for completed or denied projects.

FOR ASSISTANCE

Illinois Department of Natural Resources/Office of Water Resources
(847) 608-3100

FEMA Region V—(312) 408-5500.

Variance and Appeal Record

A variance is a waiver of one or more of the specific standards of the floodplain ordinance. Variance requests should be considered very carefully. Once granted, a variance can establish a dangerous precedent. Therefore, a variance should be granted only for a unique situation on a specific site. Under no circumstance should the granting of variances establish a pattern that is inconsistent with the intent of the floodplain regulations. Such a pattern could result in the community's suspension from the National Flood Insurance Program (NFIP).

Name of Applicant: _____

Property Address: _____

Type of structure and intended use: _____

1. Is structure located in the floodway?

If no, continue.

If yes, proceed with caution but only if State and Federal permits have been obtained.

The variance applicant must meet state and federal floodway permit requirements. The applicant should have a state permit or a "permit not required letter" from the Illinois Department of Natural Resources/Office of Water Resources. If the applicant does not have this documentation, DO NOT grant the variance.

2. Can the development be located outside of the floodplain?

If yes, then the variance should not be granted.

If no, continue.

Every effort must be taken to ensure that the development does not take place in the floodplain. This may involve relocating the actual building site on the parcel or revising construction plans to minimize the chances of flooding. In some cases, this may involve using a separate parcel that is not located in a floodplain.

Explain why the development cannot be located outside of the floodplain _____

3. Has the applicant shown that there will be no additional threats to public safety, cause additional public expense, create nuisances, cause fraud or victimization of the public or conflict with existing laws or ordinances?

If no, then the variance should not be granted.

If yes, then continue.

Any building which is permitted below the flood protection elevation has an increased risk of flood damage. The building will add to the local government responsibilities for many years. Future owners of the property and the community as a whole are subject to all the cost, inconvenience, danger, and suffering that those increased flood risks may bring. In addition, future owners may purchase the property and be unaware that it is subject to flooding. Potential public expenses such as rescue costs, utility shut off costs, employee overtime, fuel costs, and road damage are all common during flood events.

Explain why the development will not increase flood heights, create additional threats to public safety, or cause additional public expense: _____

4. Has the applicant shown that the requirements of the floodplain ordinance will create an exceptional hardship?

If no, then the variance should not be granted.

If yes, continue.

The hardship that would result from failure to grant a requested variance must be exceptional, unusual, and peculiar to the property involved. Economic or financial hardship, inconvenience, aesthetic considerations, physical handicaps, personal preferences, the disapproval of one's neighbors, or homeowners association restrictions DO NOT, as a rule, qualify as exceptional hardship. As "heartless" and difficult as it may be, only physical characteristics and not personal matters (including additional cost) should be considered.

Please document what the exceptional hardship is: _____

5. Do the conditions of the proposed variance provide the maximum practical flood protection to the proposed construction?

The variance board should consider every available means to ensure that the structure is not susceptible to flooding. This may involve partially or fully elevating the structure, dry floodproofing the building, raising all utilities to or above the base flood elevation, using flood resistant materials, designing openings for water to flow through the structure, or using watertight sealant.

What is the applicant required to do in order to provide the maximum practical flood protection?

6. Is the requested variance or exception for the construction or restoration of a structure listed on the National Register of Historic Places or the State Historic Register?

If no, continue

If yes, Attach a letter or appropriate documentation from either agency that shows that structure is an historic building.

IF a variance is granted, the community is required to notify the applicant in writing that a variance will lessen the degree of protection and will:

7. Increase the risk to life and property.

When flooding does occur, many people will look to place the blame on others and attempt some sort of compensation through liability. Any variance applicant should be made fully aware that they are located in a documented flood hazard area and assume all of the risks.

8. Result in increased premium rates for flood insurance up to \$25.00 for \$100.00 of coverage.

Flood insurance for non-compliant structures is VERY expensive. Flood insurance costs may be so high that the owner will be unable to afford coverage.

Flood Insurance is required for any direct or federally insured loan. Although the present applicant may not be taking out a loan or want flood insurance, any potential future buyer will likely be required to carry flood insurance. The cost of the required flood insurance will make the home very difficult to sell.

Lastly, without flood insurance the homeowner may not be eligible for disaster assistance. Chances are high that if the structure is seriously damaged during flood, the result may be an abandoned or poorly repaired building creating an eyesore in your community.

AS AN APPLICANT REQUESTING A VARIANCE TO BUILD A STRUCTURE WITH THE LOWEST FLOOR ELEVATION BELOW THE BASE FLOOD ELEVATION (100-YEAR), THE

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

D.M.B. NO. 1860-0008
 Expires March 31, 2012

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

BUILDING OWNER'S NAME	FOR INSURANCE COMPANY USE
STREET ADDRESS (including Apt., Unit, Suite, and/or Bldg. Number) OR P.O. ROUTE AND BOX NUMBER	POLICY NUMBER
OTHER DESCRIPTION (Lot and Block Numbers, etc.)	COMPANY NAIC NUMBER
CITY	STATE ZIP CODE

SECTION I—FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Provide the following from the proper FIRM:

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

Floodproofing Design Elevation Information:

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

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

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

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

Non-Residential Floodproofed Construction Certification:

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

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

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

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

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

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

CONTACTS FOR ASSISTANCE

**Illinois Department of Natural Resources
Office of Water Resources**
One Natural Resource Way
Springfield, IL 62701-1787
217-782-3863
www.dnr.state.il.us

**Illinois Department of Natural Resources
Office of Water Resources**
2050 Stearns Road
Bartlett, IL 60103
847-608-3100

**Federal Emergency Management Agency
Region V**
536 South Clark Street
Chicago, IL 60605-1521
312-408-5500
www.fema.gov

Federal Emergency Management Agency
Maps and Supply Order Facility
800-358-9616
www.fema.gov

**Illinois Department of Natural Resources
State Water Survey**
Hydrology Division
2204 Griffith Drive
Champaign, IL 61820-7495
217-333-9545
www.dnr.state.il.us

**U.S. Army Corps of Engineers
Rock Island District**
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004
(309) 788-6361

www.mvr.usace.army.mil

**U.S. Army Corps of Engineers
Louisville District**
P.O. Box 59
Louisville, KY 40201-0059
(502) 582-6461
www.lrl.usace.army.mil

**Illinois Environmental Protection Agency
Division of Water Pollution Control**
1021 North Grand Avenue East
Springfield, IL 62794-0276
217-782-0610
www.epa.state.il.us

Illinois Emergency Management Agency
500 West Monroe Street
Springfield, IL 62701
217-557-4878
www.iema.state.il.us

**Illinois Historic Preservation Agency
Preservation Services Division**
Old State Capital
Springfield, IL 62701
217-785-1279

**U.S. Department of Agriculture
Natural Resources Conservation Service**
1902 Fox Drive
Champaign, IL 61820
217-398-5273

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