OHIO FLOODPLAIN MANAGEMENT HANDBOOK

A Resource Handbook for Local Officials to Administer Flood Damage Reduction Regulations

(Photo taken by Danny Popp, Powhatan Point Floodplain Administrator)

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER – FLOODPLAIN MANAGEMENT PROGRAM

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A Resource Handbook for Local Floodplain Officials to Administer Flood Damage Reduction Regulations

2005 Revision

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Handbook Cover: The Pre-FIRM structure pictured on the front cover of this brochure is located in Powhatan Point, Ohio and was substantially damaged during flooding. The homeowner carried a national flood insurance policy with structural and contents coverage. Since then, the homeowner has successfully utilized Increased Cost of Compliance (ICC) funds to convert the former ranch home into an "Enclosure Below Lowest Floor". The lowest floor of this residential structure is now elevated three feet above the base flood elevation.

This photo demonstrates how the National Flood Insurance Program combined with mitigation can help protect communities against the effects of flood damage.

6 Administrative Procedures

7 Other Related Topics

Appendices

INTRODUCTION

Floods are Ohio's most significant hazard – whether natural or manmade. Ohio communities have been dealing with floods and the effects of flooding since the first settlers arrived. Over the past several hundred years, many different approaches have been used to reduce the effects of flooding. Still, flooding continues to be a problem.

Floods are natural processes. Throughout time they have shaped the landscape, provided habitat for wildlife, and created rich soils. At the same time floods have been our nation's greatest natural disaster, disrupting lives, and often causing significant economic losses. Human activity often leads to flood damage. When people use floodprone areas along rivers and streams, they do two risky things. First, their homes, businesses, and activities get in the way of natural overflow of the waterway. Sooner or later, they will be damaged or destroyed. Second, buildings, pavement, landscaping, and roads take up space in the normal floodplain that is needed to carry extra water during a flood. This forces the floodwater to move farther away from the natural waterway, flooding more land. Also, it sometimes increases the velocity and height of floodwater.

In addition, there may be flood hazard areas along smaller streams that nave not been identified or mapped through a flood study. New development can increase water run-off, causing flooding in places that have never been flooded before. Some flood problems result from water runoff or its accumulation in low-lying areas. Again, development may make the situation worse.

The term "Floodplain Management" refers to a broad program of corrective and preventive actions to reduce the damages caused by flooding and to promote the natural benefit of floodplains. Floods occur when streams overflow their banks and spill onto the adjoining land area or floodplain. Loss of life and property damage result when incompatible or unwise development occurs in the floodplain. Large floods in Ohio, such as those experienced in 1913, 1937, 1959, 1964, 1969, 1990, 1997, 1998, and 2003 have caused billions of dollars worth of property damage and the loss of many lives. The framework for effective floodplain management at the local, state and federal levels is based on a combination of strategies intended to reduce flood damages. The strategies are:

Keeping people and buildings away from flood water through:
1. Floodplain regulations
2. Deed disclosure of flood risk
3. Flood warning systems and preparedness planning
4. Purchase of floodplain lands to prevent development
5. Planning

Keeping floodwaters away from people by:
1. Constructing dams, levees and floodwalls
2. Enlarging or altering stream channels
3. Decreasing runoff through land treatment measures
4. Stormwater management structures

Reducing the costs of flood losses to individuals and communities through:
1. Flood insurance
2. Flood disaster relief
3. Tax adjustments

Preserving and restoring natural resources and functions of floodplains by:
1. Floodplain, zoning, and subdivision regulations
2. Enhancing Biological diversity
3. Protecting wetland functions
4. Purchase of floodplain lands and/or easements
5. Mitigation
6. Education and outreach
7. Planning

Why Ohio Communities Should Care About Floodplain Management[1]

If you are a local official in one of Ohio's 700 floodprone communities, you face a major dilemma. How should you plan now to be prepared for future floods? Should you do nothing and hope you won't have to answer angry and confused citizens after a flood occurs? Unless your community has planned ahead, it will be very difficult to resolve tough issues during the chaotic and emotional period after a flood. This handbook will help you, as a local official, take action to prepare your community for floods that *will happen*, either during your time with the community or at a later date. Everyone will benefit from your initiative.

Our ancestors did not have the information you have about where floods occur. They settled along rivers and streams for reasons that were valid then – rivers provided fresh water, transportation, and energy. This pattern of development continued as communities grew to their present form. As a result, a large portion of your community's tax base and major economic centers may already be located in areas susceptible to flooding.

As a local official, you may now have to deal with the consequences of those past decisions. You are likely the one who needs to provide leadership so that your constituents do not make the same mistakes in the future. Unless there has been a recent flood, you (and citizens in your community) may not know much about the actual flood risk in your community. You may not realize that many community problems and needs are closely connected to how the floodplain is used.

[1] Excerpted and adapted from Addressing your Community's Flood Problems: A Guide for Elected Officials, Association of State Floodplain Managers.

By recognizing the problems that floods can cause to your community and the resources that floodplains can provide, you can create opportunities for finding long term solutions to flooding and other, related issues. You can do this by:

- Understanding where flooding occurs in your community and why.
- Understanding the benefits that floodplains can provide to your community.
- Leading an investigation of the best ways your community can avoid flood damages and maximize the potential of your floodplains.
- Providing leadership and assisting elected officials in setting goals, implementing them, coping with a flood disaster, and supporting wise flood recovery measures.
- Ensuring the public health and safety of your citizens.
- Setting a positive public example.
- Keeping long-range, community-wide goals (economic and otherwise) in mind and balancing them against potential short-term economic gains.
- Making sure that all available, local resources are used wisely.
- Obtaining technical and financial assistance when needed.
- Building support for your community's vision of its future floodplains.

There are many different kinds of floodplains and flood problems. But experience has shown that certain techniques and activities usually reduce flood damage and make the most of floodplain lands no matter what the situation. This handbook focuses on the most widely used technique in Ohio – adopting and administering local flood damage reduction regulations and participation in the NFIP. Additionally, the handbook provides information on other techniques that can further enhance your efforts.

In Ohio, the Floodplain Management Program (FMP) of the Department of Natural Resources' Division of Water has been designated as the State Floodplain Management Office. The FMP staff is committed to assisting Ohio communities to develop effective and comprehensive floodplain management programs. Through technical assistance, increased public awareness of flood hazards, education on flood damage reduction strategies, and the development of protection standards, the FMP staff of the Division of Water hopes to provide leadership to local governments, state agencies, and interested parties toward cooperative management of Ohio's floodplains. We encourage the reduction of flood damage and the recognition of the natural benefit of the floodplain.

The FMP is responsible for:

- Providing technical information on flood hazards and guidance on interpretation of that information.
- Assisting communities in establishing local floodplain management programs including development of model regulations requiring flood protection.
- Technical review assistance concerning the impact of proposed projects in flood hazard areas.
- Coordinating the NFIP activities for almost 700 participating Ohio communities.

- Assisting the Ohio Emergency Management Agency during flood disasters to identify hazard mitigation opportunities and improve local and state flood-preparedness efforts.

This handbook has been developed to assist local officials in understanding current tools for non-structural floodplain management, specifically focusing on flood mapping and local floodplain management regulatory programs, which are usually established to participate in the National Flood Insurance Program (NFIP). The handbook refers to two other publications produced by the Floodplain Management Program that will be helpful in administering local floodplain management programs:

Ohio Floodplain Regulation Criteria (2002)
National Flood Insurance Program Substantial Damage Determinations: A Guide for Local Officials (1998)

These three publications will give communities an excellent foundation upon which to build local floodplain management programs.

Funds for this revision were provided by the Federal Emergency Management Agency through the Community Assistance Program/State Support Services Element. The statements and views presented in this document do not necessarily reflect those of the federal government.

Floodplain management programs need local government administration and implementation to assure success. The Ohio Department of Natural Resources staff hopes this handbook will help support local officials in managing their own programs.

For further information or assistance please contact:

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CHAPTER 1: FUNDAMENTALS OF FLOODING AND FLOODPLAINS

1.1 FLOODING: OVERVIEW[2]

Flooding is a natural and beneficial function of stream and lacustrine, or lake, systems. Floods occur when rivers, streams or lakes overflow their banks and spill onto the adjoining land area, which is called a floodplain. Loss of life and property can result when people build structures and develop in flood hazard areas. Numerous factors can cause or exacerbate flooding in Ohio including: heavy and/or prolonged periods of rainfall, snowmelt, soil saturation, ground freeze, severe wind events, and inadequate drainage systems.

In Ohio, there are many types of flooding that occur, including riverine, flash flooding, coastal flooding, and shallow flooding. Floods damage private and public property and infrastructure in Ohio every year. Flooding is the most frequently occurring natural disaster in Ohio and the United States.

1.2 TYPES OF FLOODING[3]

Riverine flooding is flooding produced by a river or stream. On larger rivers and streams it is generally characterized by slower rising water, which allows for increased warning time but has the potential to last for longer periods of time. Ohio communities experience riverine flooding on both large basins and smaller tributary streams throughout the state. Major sources of riverine flooding in Ohio include the Ohio River, Scioto River, Great Miami River, Muskingum River, Hocking River, Maumee River, Sandusky River, Cuyahoga River, Grand River, Little Miami River, Mahoning River and their large tributaries.

Flash flooding can occur when a severe storm produces large amounts of rainfall in a short time. Flash flooding is generally characterized by high velocity water that rises and recedes quickly, allowing little or no warning time to evacuate. Ohio's Appalachian Region is particularly vulnerable to flash flooding because of the steep terrain and narrow stream valleys. Ohio's urban areas also experience flash flooding that may be attributed to inadequate or poorly maintained storm water infrastructure, an increase in impervious area, and/or loss of wetland areas. The U.S. Geological Survey has concluded that urbanization generally increases the size and frequency of floods and may increase a community's flood risk.

Coastal flooding occurs in the counties that border Lake Erie. Flooding in coastal areas can be caused by stream overflow, wave run-up caused by strong winds, ice

[2] Excerpted and adapted from the "State of Ohio Enhanced Mitigation Plan"
[3] Excerpted and adapted from the "State of Ohio Enhanced Mitigation Plan"

jams, and higher than normal lake levels. Annual fluctuations in Lake Erie water levels are the result of seasonal changes and the amount of water flowing into and out of the lake. Inflow for Lake Erie includes drainage from the upper portion of the Great Lakes basin through the Detroit River, water from streams flowing directly into the lake, ground water, and precipitation falling directly onto the lake. Out-flow includes discharge into Lake Ontario through the Niagara River, evaporation, and any diversions or other withdrawals. Lake Erie levels also exhibit a wider range of long-term fluctuations that are the result of prolonged and persistent deviations from average climatic conditions.

Shallow flooding occurs in flat areas with inadequate channels that prevent water from draining easily. There are four types of shallow flooding: sheet flow, ponding, urban drainage and rural drainage. Sheet flow flooding occurs in areas where channels are not defined. Sheet flow flooding moves downhill and covers a large area under a relatively uniform depth.

Ponding occurs in flat areas where runoff collects in depressions and cannot adequately drain. Ponding can occur where glaciers carved out depressions in the landscape, and where man-made features, such as roads, have blocked drainage outlets.

Ice Jams occur when ice covers rivers and lakes. Ice forms in freshwater bodies whenever the surface cools to 0^{o} C (32^{o} F). The annual freeze and break up may occur without major flooding, however, the presence of an ice jam can result in scouring, river bed and bank erosion that may lead to bridge or overall riverbank failure and can increase the vulnerability to flooding. Ice jam mitigation measures, structural or nonstructural, can help control jams. Some are permanent or deployed in advance of an anticipated flood threat, while others are deployed under emergency conditions when a jam has formed and flooding has occurred.

1.3 NATURAL FUNCTION OF FLOODPLAINS

Floodplains are important to Ohio's water resources because they provide natural flood and erosion control, reduce flood velocities, help maintain high water quality, and contribute to sustaining groundwater supplies. Floodplains have living resource value as they are among the most productive of all ecosystems, supporting a wide variety of flora and habitat for fish and wildlife. The cultural resources of floodplains include the maintenance of a harvest of agricultural products, places for recreation, outdoor education, and often sites of historic and archeological interest. Although these values are recognized, it has been difficult, and sometimes impossible, to assign economic values to the functions served and benefits provided by floodplain.[4]

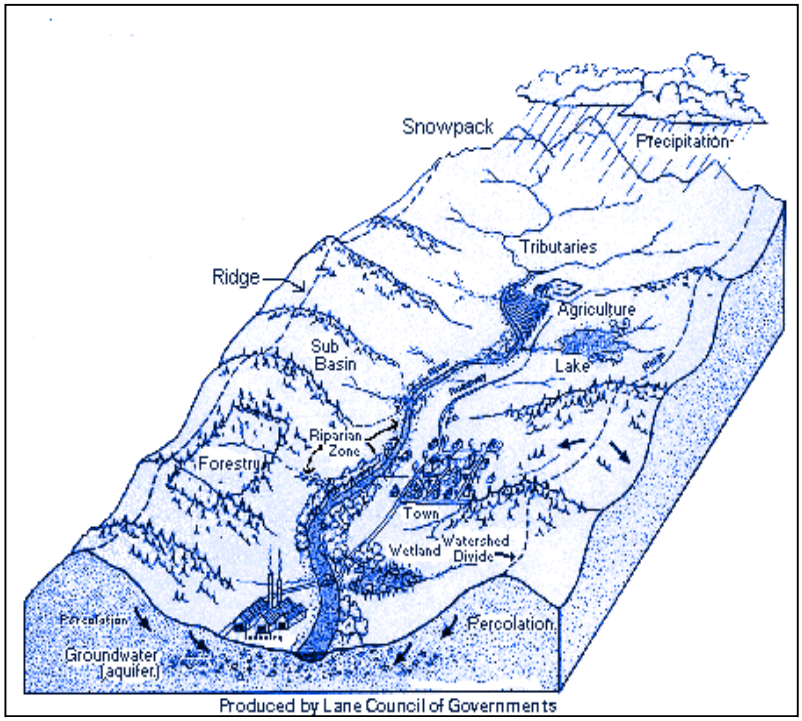
[4] OFPRC (Adapted from *Floodplain Management in the United States: An Assessment Report (1992)*. Please see the bibliography for additional information.)

1.4 WATERSHEDS

A watershed is an area of land that that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel.[5] Watersheds are defined by natural hydrology and do not adhere to the boundaries of political jurisdictions.

Communities often develop a network of components to manage the accumulation and distribution of water throughout a watershed. Urban drainage systems can include combinations of ditches, storm sewers, detention ponds, house gutters, and yard swales. When a rainfall event exceeds the design capacity of the drainage system it can result in sewer backup and overflowing ditches. Basements are highly susceptible to flood damage caused by overloaded sewer and drainage systems. Urban drainage flooding can also occur behind levees when rainfall amounts exceed the capacity of pumps or other man-made systems designed to drain the areas protected by the levee.

Rural drainage flooding in northwest Ohio is similar to urban drainage flooding in Ohio's cities and villages. Most of northwest Ohio was covered by a large swamp prior to European settlement that was subsequently drained and since used mainly for agriculture. The flat topography of this area is drained by an extensive system of ditches, swales, and small meandering streams. Rural flooding occurs when rainfall exceeds the design capacity of the drainage system.[6]



Graphic obtained from http://www.epa.gov/owow/watershed/whatis.html

1.5 HYDROLOGY AND HYDRAULICS

There are many factors that contribute to riverine flooding. In order to quantify how the various factors affect the severity and probability of flooding, scientists and engineers have generally grouped the factors into two disciplines of study, hydrology and hydraulics.

[5] The Natural and Beneficial Functions of Floodplains, June 2002
[6] Excerpted and adapted from the "State of Ohio Enhanced Mitigation Plan"

Hydrology is a branch of science that is concerned with the origin, distribution, and properties of the waters of the earth.[7] For the purposes of riverine flood studies, hydrology is the science that is concerned with the various processes that move water to the streams and floodplains. The main items that are usually determined in a hydrologic study are the rate at which water moves downstream [usually expressed in cubic feet per second (cfs)] and the frequency with which floods exceeding a certain magnitude occur. The frequency refers to the average length of time between floods that equal or exceed a certain magnitude. It is often referred to in terms of a recurrence interval such as the 10-year, 100-year, or 500-year flood.

Once the rate of flood flow has been determined for the desired recurrence-interval, a hydraulic study can be performed to determine flood elevations. **Hydraulics** is the physical science focused on the behavior of fluids (in this case, water), and is dependent on the physical geometry of the stream, or river cross-section.[8] For the hydraulic analysis, the shape of the channel and floodplain must be obtained from a ground or aerial survey. Obstructions in the floodplain, such as bridges, culverts, and dams, are also measured so that their effect on flood elevations can be determined. If a stream being studied is to have a floodway delineated (which will be explained in Chapter 4), it will be completed in the hydraulics portion of the study.

[7] Excerpted and adapted from the Handbook of Flood Plain Hydrology and Hydraulics – ODNR DOW Technical Paper No. 2 September 1983

[8] Excerpted and adapted from the Handbook of Flood Plain Hydrology and Hydraulics – ODNR DOW Technical Paper No. 2 September 1983

CHAPTER 2: HISTORY OF FLOODING AND FLOODPLAIN MANAGEMENT

2.1 OHIO'S FLOOD HISTORY

Floods have affected Ohio since the beginning of recorded history. Early records indicate that a flood on the Ohio River in 1773 was as great as the more well known and documented 1937 Ohio River Flood. Significant floods in Ohio during the last century occurred in 1913, 1937, 1959, 1969, and 1990. An excellent account of Ohio's flood history can be found in the book Thunder in the Heartland by Thomas and Jeanne Schmidlin.

Heavy rain on saturated soils caused flooding throughout Ohio during March 23-27, 1913 killing 467 people, destroying 2,200 homes, and flooding 40,637 residences. Losses totaled $113 million in 1913 dollars ($2.15 billion in 2003 dollars), including $78 million to buildings and personal property, $12 million to roads and bridges, $12 million to railroad property (which includes lost profit), $6 million to the agricultural industry, and $4 million to machinery. This flood set record water levels on many Ohio streams. The Miami River watershed experienced the highest casualties and damages during this event.

The record flood for the Ohio River occurred during the last two weeks of January 1937. Normal January precipitation in Ohio is 2-3 inches. The statewide average rainfall in January 1937 was 9.57 inches, with some stations recording over 14 inches. Ohio River levels on January 26-27 were the highest ever recorded from Gallipolis, Ohio to the confluence with the Mississippi River. Every Ohio community along the river was flooded resulting in ten casualties, 16 injuries, thousands of damaged structures, and over 54,000 evacuations statewide. Losses were estimated to be around $35 million in 1937 dollars ($448 million in 2003 dollars).

Rainfall in January 1959 ranging from 3-6 inches on snow-covered, frozen ground caused the most severe statewide flooding since 1913. Streams reached flood stage from January 21-24 killing 16 people, forcing 49,000 people from their homes, and causing extensive damage to homes, businesses and infrastructure. Loss estimates for this event totaled $100 million in 1959, or over $630 million in 2003 dollars. Some of the factors that reduced casualties and damages from the 1913 flood included: less intense rainfall amounts, construction of flood-control reservoirs built after 1913, and improved emergency management procedures and capabilities.

Severe thunderstorms moved from Lake Erie into Ohio's coastal communities on July 4, 1969. This line of storms became nearly stationary for more than eight hours aligned from Toledo southeast to Wooster. Official records indicated over ten inches during a two-day period. Flooding combined with strong wind and tornadoes caused 41 deaths and injured 559 people. Loss estimates for this event totaled $65 million in 1969, or over

$328 million in 2003 dollars. This flood caused extensive damage to homes, businesses, infrastructure, utilities, boats and automobiles.

Twenty-six people died in a flash flood near Shadyside, Ohio on June 14, 1990. The National Weather Service estimated that 3-4 inches of rain fell in a little over an hour near Pipe Creek and Wegee Creek. Total rainfall was estimated at 5.5 inches in three hours. The saturated soils and narrow, steep-sided valleys caused the water to drain quickly into the creeks. Flash flooding began at 9:30 pm and was over in thirty minutes. During that time a wall of water six feet high (reported to be 20 feet in some areas) rushed through the valley at seven to ten miles per hour. Approximately 80 homes were destroyed and 250 were damaged.

Storms that produced heavy rains during March 1-2, 1997, resulted in severe flooding in southern Ohio. The largest accumulations of rainfall were recorded in southern Adams and Brown Counties and ranged from 10-12 inches over the two-day period. Generally, rainfall amounts of four or more inches fell on most of the counties along or near the southern border of Ohio. Widespread damages to private and public property occurred throughout the area. Preliminary loss estimates totaled nearly $180 million in 1997, or over $201 million in 2003 dollars. Approximately 20,000 people were evacuated and 6,500 residences and 833 businesses were affected. Five deaths were attributed to flooding, all of the fatalities the result of attempts to drive through flooded roads. Storms during June 26-30, 1998, resulted in flooding and widespread damage throughout much of central, east-central and southeastern Ohio. More than ten inches of rain fell during a four-day period in parts of southeast Ohio. Twelve storm or flood-related fatalities were reported, and infrastructure and utilities were heavily impacted. Loss estimates totaled nearly $178 million in 1998, or over $196 million in 2003 dollars.

2.2 A HISTORY OF FLOODPLAIN MANAGEMENT IN THE UNITED STATES

Historical responses to flooding can be divided into three major era's according to the Federal Interagency Floodplain Management Task Force. The Frontier Era (pre-1917) was characterized by limited federal involvement in flood control or relief. During this time, many federal policies and programs encouraged land development with the common goal being "to conquer the wild landscape and to promote productive use of the land". Flood hazards were the problem of the individual property owner, or dealt with cooperatively at the local level.

The Structural Era (1917-1959) was characterized by attempts to modify and control floodwater and get water off the land as quickly as possible. The federal government began assuming the costs to construct dams, levees, reservoirs, and other large structural flood control projects. Near the end of this era resource managers began to realize that flood control projects were not eliminating flood damage and may be harming the environment.

During the Stewardship Era (1960-present), people began to recognize the important benefits and natural functions provided by floodplain areas such as natural flood and erosion control, water quality maintenance, groundwater recharge, recreation, wildlife habitat, agricultural production and many others. The responsibility of floodplain management began to shift from the federal government back to the local level. The federal government began to focus on other mechanisms like flood insurance, building codes, and disaster assistance to reduce the impacts from flooding because flood losses, despite the investment of billions of dollars in flood control works, were increasing. Collectively, these measures are called “non-structural” approaches floodplain management.

Congress created the National Flood Insurance Program in 1968 as a response to mounting flood losses and increasing disaster relief costs. The intent of the program was to reduce future flood damage through community floodplain management ordinances, and provide an insurance alternative to federal disaster relief. In 1988, the Robert T. Stafford Relief and Emergency Assistance Act (known commonly as the Stafford Act) was passed which amended an earlier law, the Disaster Relief Act of 1974. The Stafford Act gave authority to FEMA for the establishment of hazard mitigation programs, and was again amended in 2000 to require that communities develop and adopt all hazard mitigation plans as a stipulation of receiving future federal mitigation funds.

2.3 A HISTORY OF FLOODPLAIN MANAGEMENT IN OHIO

The great flood of 1913 caused the Ohio General Assembly, in 1914, to pass the Ohio Conservancy Act. At the same time, the citizens of the Miami Valley rallied to initiate plans for the prevention of future flooding. Some 23,000 citizens contributed over $2,000,000 to begin a comprehensive flood protection program on a valley-wide basis. Arthur Morgan, an engineer who would later go on to be the first director of the Tennessee Valley Authority, was hired to implement this vision. Ultimately, these steps led to the creation of the Miami Conservancy District, the first local agency in the United States to have the authority for comprehensive flood management.

The Conservancy Act permitted citizens of a threatened area to work together to plan, finance and manage a flood control project. Under the law a watershed area could be organized into a conservancy district, with the status of a political subdivision of the state and a public corporation. The Conservancy District would have the power to plan, construct and administer flood control and conservation projects. In 1933, the Muskingum Watershed Conservancy District was formed – Ohio’s largest and second oldest. Like the Miami Conservancy District, the MWCD planned and constructed numerous flood control works.

Although the Conservancy District Act led to the creation of Conservancy Districts – and ultimately led to reducing flood damages in those areas where the Conservancy Districts were active -- the focus was “structural” flood control – largely building levees,

dams, and channel modifications. As the nation began focusing on non-structural approaches to floodplain management, Ohio, too began to explore ways to implement such measures. In the early 1970's the Ohio Department of Natural Resources established a Floodplain Management Section within the Division of Water. In the 30+ years since that time, over 700 Ohio communities have enacted local floodplain management regulations, and the state floodplain management office has overseen the administration and development of the National Flood Insurance Program in Ohio.

CHAPTER 3: OVERVIEW OF THE NATIONAL FLOOD INSURANCE PROGRAM

In 1968 Congress passed the National Flood Insurance Act (42 USC 4001) to correct the shortcomings of traditional flood protection and flood relief programs. The National Flood Insurance Program (NFIP) makes flood insurance available to property owners in communities that agree to adopt an ordinance or resolution regulating development in flood prone areas. The intent of the NFIP is not to prohibit, but to **guide** development in floodplain areas in a manner consistent with both nature's need to convey floodwaters and a community's land use needs. The floodplain regulations required by the NFIP are designed to accomplish three basic objectives related to flood damage protection:

- To prevent new developments from unduly increasing flood damages to others;
- To ensure that new buildings will be free from flood damage.
- To ensure that existing buildings, when substantially damaged or improved, will be brought up to current floodplain regulations so they will be flood protected.

One shortcoming of the original act, however, was that it did not have any mandatory requirement to purchase flood insurance. In 1972, Hurricane Agnes demonstrated the ineffectiveness of the voluntary flood insurance provisions of the 1968 Act. So, in 1973, Congress passed the Flood Disaster Protection Act, which tightened the NFIP by providing sanctions, primarily affecting lending institutions. It was the most significant expansion of both the provisions and the national impact of the NFIP. This Act required:

- Acceleration of Flood Insurance Studies
- Notification to communities of their identification as flood-prone, and
- The creation of the mandatory purchase of flood insurance requirement relative to federally backed loans. Any lending institution regulated by a federal instrumentality had to require flood insurance on any loan for a structure in the 100-year floodplain. This included, for example, the FDIC, FSLIC, SBA, VA, and FHA. Today this concept is frequently referred to as "the lender compliance issue".

The notification process and mandatory purchase requirement appears to be what led many Ohio communities to join the NFIP, a trend that continues today.

When the NFIP was created, Congress recognized that the insurance for “existing buildings” constructed before a community joined the NFIP would be prohibitively expensive if the premiums were not subsidized by the federal government. As a result,

these buildings, also known as "Pre-FIRM" have premiums that are indeed subsidized. However, buildings built generally after communities joined the program[9] are considered "Post-FIRM," and their insurance rates are based on their actual flood risk (also called actuarially rated). It is important to remember, though, that the subsidized rates for Pre-FIRM structures are subsidized within the NFIP, which come from premiums collected – they are not taxpayer dollars!

Overall funding for the NFIP is through the National Flood Insurance Fund, which was established as part of the original 1968 Act. Flood insurance premiums collected are deposited into the fund and losses, operating, and administrative costs are paid out of the fund. In addition the NFIP has the authority to borrow up to $1.5 billion from the U.S. Treasury, which must be repaid along with interest. Until 1986, program expenses, flood hazard mapping, and floodplain management costs were paid by an annual appropriation from Congress. From 1987 until 2001, all program costs were paid by premium and fee income from the NFIP. Then, beginning in 2001, Congress once again began appropriating funds for flood hazard mapping as part of FEMA's Map Modernization initiative.

3.1 NFIP SUCCESS

The NFIP, by many accounts, has proven successful and benefited all U.S. taxpayers. From 1969 through 2002, the NFIP has paid $11.9 billion in losses that would otherwise have been paid by taxpayers through disaster assistance or borne by homes and businesses themselves. Moreover, because the NFIP has led to the identification of flood hazards in the country as well as over 19,000 communities adopting regulations for development in flood hazard areas, the frequency and severity of flood damages to structures built in compliance with floodplain management regulations have been significantly reduced. **Structures built to the minimum NFIP standards experience 80% less damage, and FEMA estimates that $1 billion in losses each year are avoided because of these safer buildings.** Finally, the NFIP has had to borrow money from the U.S. Treasury in the past, and is one of the few programs in existence that has paid every cent back, with interest.

The National Flood Insurance Program is important to Ohio communities. Currently, there are over 34,000 flood insurance policies in effect with coverage totaling $3.4 billion. Since 1978, there have been over $100 million in flood insurance claims paid. The NFIP is administered by the Federal Emergency Management Agency (FEMA), and coordinated in the State of Ohio by the Ohio Department of Natural Resources, Division of Water.

[9] Actually, structures built after the first Flood Insurance Rate Map was issued

3.2 WHO ARE THE IMPORTANT GROUPS THAT MAKE THE NFIP WORK?

The organizational relationships of federal, state, local, and private sectors, with regard to the NFIP form a unique set-up of overlapping partnerships. Each group of players is necessary to make the NFIP work.

Federal Government

The federal government has the responsibility to identify and map the flood hazard areas of all communities.

The federal government provides federally backed flood insurance in exchange for good floodplain management, via an ordinance that regulates all development in the special flood hazard areas of a community. These flood hazard areas have been identified on a map, which the federal government has provided and paid for. Congress authorized FEMA, through the Federal Insurance Administrator, to identify the flood hazard areas, make maps available, and make insurance available at reasonable rates. There have been a few occasions when a private insurer has provided flood insurance outside of the NFIP, but these ventures have been few and far between. Most drop the coverage when it is found to be too costly. Flood insurance is not available in communities that do not participate. The federal government will make flood insurance available only in those communities that agree to adopt and enforce an ordinance.

State Government

In the overall organization of the NFIP, FEMA has asked each state to appoint a coordinating agency. In Ohio, the state coordinating agency is the ODNR, Division of Water, with the day-to-day responsibilities of coordinating the NFIP belonging to the Division of Water's Floodplain Management Program. The state's responsibilities for coordination are outlined in the NFIP Regulations at 44 CFR §60.25:

- Enabling legislation to allow the local units of government to adopt ordinances
- Encourage and assist communities in qualifying for participation
- Ordinance assistance
- Community assistance
- Coordination of local floodplain activities
- Flood Insurance Study and mapping assistance (currently through FEMA's Map Modernization program)
- Monitoring (Community Assistance Contacts/Community Assistance Visits)
- Establish minimum state standards

- Mitigation assistance
- Training

One of the state's important roles in the NFIP is to provide the authority for communities to adopt the proper ordinances. The Floodplain Management Program has developed model regulations that are compliant with the minimum NFIP standards and assists communities with adopting and amending their own floodplain management regulations. It is also the state's role to provide technical assistance to the communities and to provide training.

One function that receives a lot of emphasis is the Community Assistance Visit (CAV). Many of Ohio's municipalities have been on the receiving end of a CAV. A visit is exactly what it implies. Someone representing FEMA (usually the state) goes to the community, sits down with the local officials, and reviews the local floodplain management program as it relates to the NFIP. The CAV is not intended to be a punitive action, but rather a method of offering assistance and guidance to the participating community, if needed. Still, a CAV could result in an enforcement action from FEMA if violations of local floodplain regulations are discovered, or the community essentially has no administrative processes for issuing permits, tracking them, or taking enforcement actions. This visit is followed by a report to FEMA and a letter to the community with recommendations, or in some cases, noting the good job that the community is doing.

Other outreach activities include training workshops, a newsletter (*The Antediluvian*) published twice each year, and assistance to Ohio communities after a flood event.

The Ohio Floodplain Management Program averages approximately 3,600 calls per year from communities, citizens, lenders, surveyors, insurance agents, and the public seeking assistance. The State Program maintains copies of each community's ordinance and copies of their FIRMs. It also maintains a supply of publications and videos. If you need any floodplain management assistance, the Ohio Floodplain Management Program is here to help.

It is the goal of FEMA's Map Modernization initiative to update the flood maps of the State of Ohio in a 5-10 year period. Updating these maps results in better maps and better flood risk management. The Floodplain Management Program is the state entity coordinating Map Modernization and is performing various activities, including coordinating and developing Cooperating Technical Partners.

Local Government

The local government means the community. In Ohio, communities that can participate in the NFIP include villages, cities, and counties (unincorporated areas). Townships do not have the necessary authority to participate in the NFIP independently; they

automatically participate if the county participates. Likewise, county floodplain management regulations apply to all townships in a county.

Because states have empowered communities to regulate land use, and because Congress believed it was more appropriate for development to be regulated at the local level, the NFIP was designed to function as an "exchange" type of program. Congress would underwrite flood insurance in return for the community's adoption and administration of regulations for development in floodplains. Specifically community responsibilities include:

- **Adopt and enforce** floodplain management regulations
- **Require** permits for all types of development in the floodplain
- **Assure** that building sites are reasonably safe from flooding
- **Require** new or improved homes or manufactured homes be elevated above the Base Flood Elevation (BFE)
- **Require** other buildings be elevated or dry floodproofed (made watertight)
- **Conduct** field inspections and cite violations
- **Require** elevation certificates to document compliance
- **Carefully consider** requests for variances
- **Resolve** non-compliance and violations
- **Advise** FEMA when updates to flood maps are needed
- **Cooperate** with FEMA by periodically responding to requests for information (through CAV's, etc.)

It is important to remember that joining the NFIP is a voluntary decision. But, once a community decides to join the NFIP, the requirements to administer and enforce local regulations are not voluntary, regardless of whether or not a property owner wishes to purchase flood insurance.

The benefits of participation in the NFIP are summarized in the fact sheet located in Appendix D.

Private Sector

There are several private sector participants in the NFIP who are important to the success of the NFIP. Below is a partial list of them along with their function:

- *Insurance Agents.* Although the NFIP is a federal program, flood insurance policies are written by private, licensed insurance agents. So, the flood insurance policy that is written by Nationwide is the same policy that is written by State Farm; both companies write NFIP flood policies. Along with writing policies, insurance agents settle claims.

- *Lenders.* Lenders (banks, credit unions, etc.) must make sure the mandatory flood insurance purchase requirements of the NFIP are enforced when new mortgage loans are made. The mandatory purchase requirement is also enforced on second mortgages, home equity loans, and home equity lines of credit.

- *Flood Zone Determination Companies*. Increasingly, lenders utilize these companies to make the determination whether a structure is located in or out of the floodplain for the sole purpose of determining whether the mandatory flood insurance purchase requirement is triggered.

- *Registered Land Surveyors.* Registered land surveyors often prepare development documents such as plat maps and land surveys. Often, surveyors are hired to prepare the documentations for a FEMA Letter of Map Amendment or Letter of Map Revision.

- *Registered Professional Engineers (P.E.)*. Whether independent or part of a consulting firm, P.E.'s often perform the analyses used to produce flood maps. They also perform impact analyses that are required as part of a community's floodplain regulations.

3.3 JOINING THE NFIP

In Ohio, over 700 communities participate in the NFIP; however, several still do not. In order for a community to participate in the NFIP, it must apply and join. An application package includes a one-page application form that must be completed, a "Resolution of Intent" that must be adopted, and a local flood damage reduction ordinance (or resolution for counties) that must be adopted. There is no cost for joining the NFIP, other than the costs to the community for completing the paperwork and adopting the required resolutions/ordinances.

Upon joining the NFIP, communities typically progress through two phases (1) the Emergency Program and the (2) Regular Program. The Emergency Program of the NFIP is the initial phase of a community's NFIP participation and was designed to provide a limited amount of insurance at less than actuarial rates. A community

participating in the Emergency Program is usually provided with a Flood Hazard Boundary Map (FHBM) (a flood map that provides limited flood data), and the community must adopt limited floodplain management requirements to manage future use of its floodplains. In the Regular Program of the NFIP, communities are usually provided with a Flood Insurance Rate Map (FIRM) and a Flood Insurance Study (FIS), which contain detailed flood data. Under the Regular Program of the NFIP, more comprehensive floodplain management requirements are imposed on the community in exchange for higher amounts of flood insurance coverage.

CHAPTER 4: FLOODPLAIN MAPS AND STUDIES

4.1 THE BASE OR "100-YEAR" FLOOD

In order to apply the standards of the NFIP equally across the United States, the federal government decided that the standards should apply to areas that have an equal probability of flooding. The flood that has a one-percent chance of occurring in any given year (one-percent annual chance flood) was selected as the basis for the program. The flood associated with this level of risk is referred to as the base flood. The base flood was chosen as a compromise between a more frequent flood (such as a 10-percent annual chance flood), which would permit excessive exposure to flood risk, and a more infrequent flood (0.1-percent annual chance flood), which would be considered an excessive and unreasonable standard.[10]

Over a long enough period of time (say 10,000 years) the one-percent annual chance flood would be expected to occur, on average, once every 100 years. It is therefore said to have a recurrence interval of 100 years and is often referred to as the 100-year flood. Similarly, the 10-year, 50-year, and 500-year floods have a ten-percent, two-percent, and two-tenths of a percent chance, respectively, of occurring in any given year and are referred to as the 10%, 2%, and 0.2% annual chance floods.

It is important to note that just because a flood event is tied to a certain recurrence interval, for instance the 100-year flood, that does not mean that a flood of that magnitude will only occur once every hundred years. Just like flipping a coin, the odds are based on a long-term average. Just because you flipped a coin and it turned up heads, you can't automatically expect the next flip to turn up tails. It is not uncommon to flip several heads in a row. Likewise, just because you have recently experienced a 100-year flood, doesn't mean that you won't see another one for 100 years. There are many communities in all parts of Ohio that have experienced more than one "100-year" flood within several years of each other.

4.2 THE SPECIAL FLOOD HAZARD AREA (SFHA)

Under the NFIP, "Special Flood Hazard Area" (SFHA) describes the area of land that would be inundated by the base flood. The SFHA is delineated on maps provided to each community by FEMA. It is also the area where the floodplain management regulations must be enforced by the community as a condition of participation in the NFIP and the area where the mandatory flood insurance purchase requirement applies.[11]

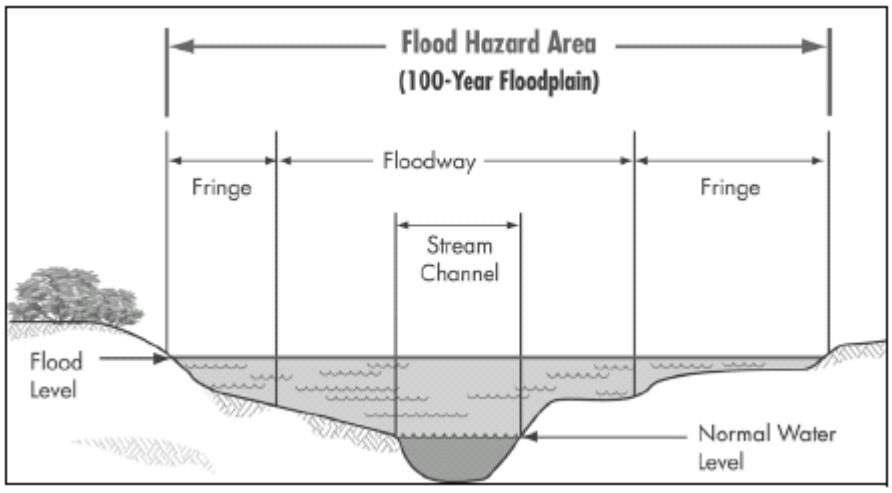
[10] Excerpted and adapted from "Managing Development Through the National Flood Insurance Program", Independent Study 9 – August 1999

[11] Excerpted and adapted from "Managing Development Through the National Flood Insurance Program", Independent Study 9 – August 1999

When FEMA has provided the base flood elevations of the SFHA on the flood maps, the community must limit the increases in flood heights resulting from development within the SFHA to no more than one foot at any point within the community. To assist in administering this requirement the SFHA may be further delineated into different subareas:

The **floodway** consists of the channel and adjacent land areas that are intended to be reserved to convey the floodwaters of the base flood. The limits of the floodway are determined through an engineering analysis such that the cumulative effect of development outside the floodway, but still within the SFHA will not result in increases in flood heights greater than the one foot allowable by FEMA. Some communities have adopted more stringent standards limiting the allowable increase to less than one foot. The floodway is typically characterized by fast moving water that has the potential to carry debris, and is generally considered the most dangerous part of the SFHA. Because the floodway is reserved to convey the base flood, any development within the floodway must not result in any increase in flood heights during the occurrence of the base flood discharge. Refer to Chapter 5 for more information regarding requirements for floodway development.

The **fringe**, also called the flood fringe or floodway fringe, is the area within the SFHA, that is outside of the floodway. It is typically characterized by slower moving water. Because the affect of filling in the fringe areas has already been analyzed and accounted for when the floodway is delineated, NFIP minimum standards allow development (as long as it is flood protected) in the fringe areas without the need for further assessment of the impact on flood heights.



4.3 WHAT ARE THE ODDS OF BEING FLOODED?

The term "100-year flood" has caused much confusion for people not familiar with statistics. Another way to look at flood risk is to think of the odds that a 100-year flood will happen sometime during the life of a 30-year mortgage. Even though there may only be a one-percent chance in any given year, over a 30-year period there is a 26% chance that a structure located in the SFHA will be flooded.

Chance of Flooding over a Period of Years

Time Period	Flood Size 10- year	25-year	50-year	100-year
1 year	10 %	4 %	2 %	1 %
10 years	65 %	34 %	18 %	10 %
20 years	88 %	56 %	33 %	18 %
30 years	96 %	71 %	45 %	26 %
50 years	99 %	87 %	64 %	39 %

Even these numbers do not convey the true flood risk because they focus on the larger, less frequent, floods. If a house is low enough, it may be subject to the 10- or 25-year flood. During a 30-year mortgage, it may have a 26% chance of being hit by the 100-year flood, but the odds are 96% (nearly guaranteed) that it will be hit by a 10-year flood. Compare those odds to the only 1-2 % chance that the house will catch fire during the same 30-year mortgage.[12]

4.4 FLOODPLAIN MAPPING

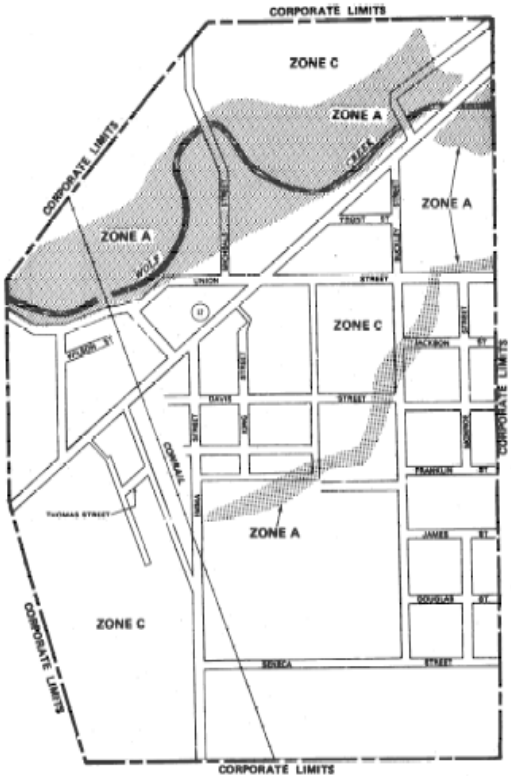
The SFHA is shown on a map that is provided to your community by FEMA. This map is known as a Flood Hazard Boundary Map (FHBM) for communities still in the emergency phase of the program, or a Flood Insurance Rate Map (FIRM) for communities that have or are about to enter the regular phase of the program. Flood Insurance Rate Maps can be either approximate (no base flood elevations) or detailed (base flood elevations and/or floodway delineated).

FEMA has produced a variety of flood maps and each type provides a different level of floodplain information. Due to the scope and cost of mapping, floodplain managers will encounter a diversity of map formats and details.

[12] Excerpted and adapted from "Managing Development Through the National Flood Insurance Program", Independent Study 9 – August 1999

Flood Hazard Boundary Maps[13]

Very few communities in Ohio are still in the Emergency Phase of the National Flood Insurance Program. In the early 1970's when the NFIP mapping was initiated, the Federal Insurance Administration (FIA) developed Flood Hazard Boundary Maps (FHBMs) for each community, without the benefit of detailed studies or hydraulic analyses. These maps approximately identified the boundaries of the SFHA. No elevations are given. The SFHA is designated as a shaded area, labeled Zone A. Typically the maps are at a large scale and a fair amount of interpretation is necessary to determine the location of SFHAs on the ground. These maps are often referred to as "flat maps".

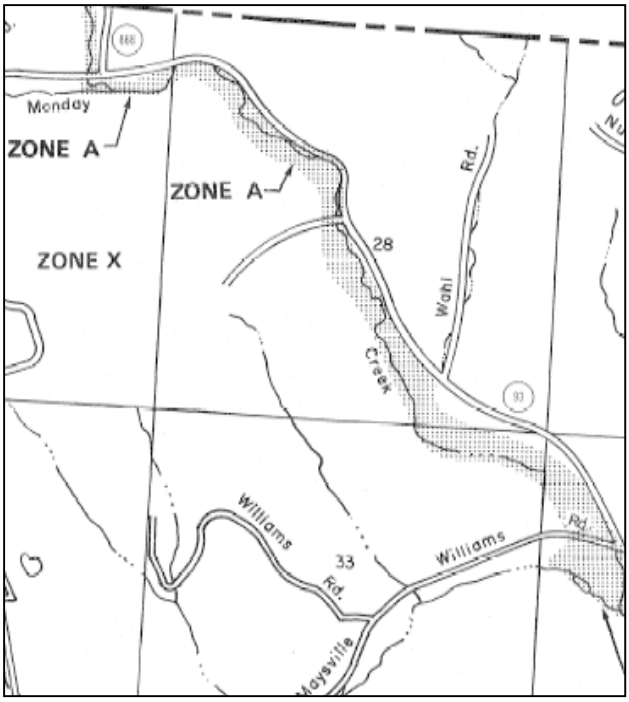


As money was appropriated by Congress, FEMA performed more detailed Flood Insurance Studies for many communities. These studies resulted in the publication of the Flood Insurance Rate Maps (FIRMs) and an associated Flood Insurance Study (FIS) report. In many smaller communities in Ohio, which are located in rural areas or are not located on major rivers, FEMA did not undertake a detailed flood study of the community but simply relabeled the FHBM as a FIRM. In a few cases, FEMA converted the FHBM to a FIRM by issuing a letter to the community stating the FHBM shall be considered a FIRM. FEMA would then instruct the community to line out FHBM on their map's title block and write in FIRM. This action was done primarily in communities with extremely low risk of flooding, with very little or no existing development in the floodplain, and very little potential for future development. This decision not to remap was also made, in part, due to federal fiscal restraints. These communities are identified in FEMA's Community Status Book by an (L) designation.[14]

[13] Excerpted and adapted from the Maine Floodplain Management Handbook (April, 2002)
[14] Excerpted and adapted from the Maine Floodplain Management Handbook (April, 2002)

Approximate Flood Insurance Rate Maps

In communities in which FEMA determined that there was a minimal flooding risk, approximate FIRMs were done. An approximate FIRM shows the area of your community that would be subject to flooding in the event of the base flood. (See portion of approximate FIRM, pictured right). With no detailed study, the FIRM shows only the boundaries of the floodplain; it does not show any flood elevations. The approximate SFHA is indicated as "Zone A" on the FIRM. Zone A is the base floodplain, and any development in that area must meet the requirements of your floodplain ordinance. Zone C or X is also shown on approximate FIRMs. This is an area with minimal flood hazards and regulations are not required by the NFIP.[15]



Detailed FIRMs

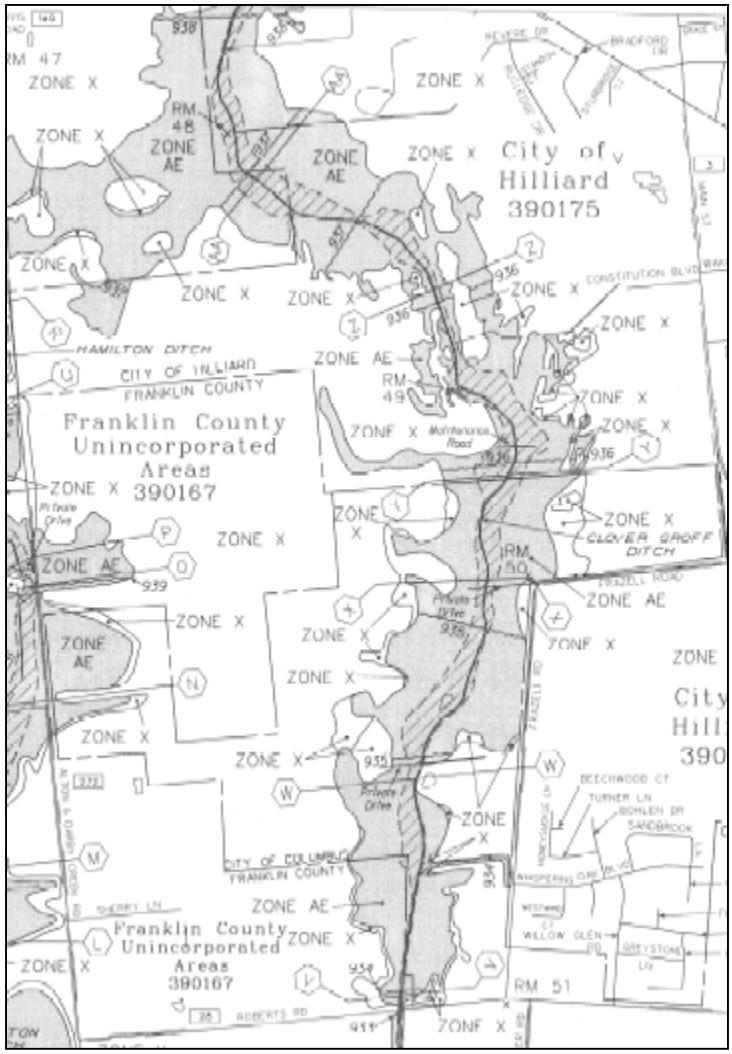
When a detailed study was justified (along major rivers, and around major lakes), a detailed FIRM and FIS report was produced. Within a community there may be areas for which a detailed study was conducted and areas for which only approximate flood boundaries were established. A detailed FIRM shows the boundaries of the base flood. (See portion of detailed FIRM below). Again, the SFHA is labeled as one of several types of A Zones. A FIRM may show the following zones or designations:

[15] Excerpted and adapted from the Maine Floodplain Management Handbook (April, 2002)

Zone A – Areas which have been determined by approximate methods to be Special Flood Hazard Areas. They show no elevations and are known as "unnumbered A zones." Regulations for development apply to these areas.

Zones A1 through A30 and Zone AE - Zones where the elevation of the base flood has been calculated and is shown on the map, sometimes as a wavy line that crosses the floodplain. On newer maps or revisions after 1985, Zone AE is used rather than numbered A Zones. Regulations apply in these zones.

Zone AO - An area of 100 year shallow flooding where depths are between one and three feet. Average depths of inundation may be shown, but no elevations are indicated. Regulations apply.



Zone AH - An area of 100 year shallow flooding with a constant water-surface elevation (usually areas of ponding) where average depths are between one and three feet. The BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Regulations do apply to these areas.

Zone B and (lightly shaded) Zone X – Generally the 500-year flood zone. It may also indicate certain areas subject to 100-year flooding with average depths less than one foot or areas where the contributing drainage area is less than one square mile. In Zone B or Zone X under the NFIP, regulation is not required. However, these mapped areas are reviewed by other federal agencies when siting critical facilities.

Zone C - An area of minimal flooding. The NFIP does not require regulation of development in Zone C.

Zone X - This is the same Zone as is referred to, in older maps, as Zone B or C. It denotes areas of lesser flood hazard. Regulations for construction do not apply to Zone X. [16]

4.5 MAKING MAP DETERMINATIONS

The FIRM is used to determine if proposed development, or any part of it, is located within the SFHA. Any development that falls within the SFHA is subject to the provisions of the local floodplain management ordinance. In order to make a determination, begin with the FIRM or FHBM index to locate the map panel for the area containing the site. If there is an asterisk on the panel number, either no flood hazard has been identified in that area or it is entirely one flood zone and the panel was not printed. Be sure the map panel is the most recent one printed by comparing the suffix letter for that panel with the suffix letter shown on the current map index. Some communities may have different panels with different effective dates due to revisions that do not affect the whole community.

Local officials are required to know how to determine the boundary of a floodplain, decide on what the BFE is for a site, and determine the boundary of the floodway.

SFHAs with BFEs

In SFHAs with BFEs, determining the BFE is relatively straightforward. If the site is not close to a cross-section with an elevation, you can:

- Use the higher of the BFEs on either side of the proposed site, or
- Refer to the flood profile in the Flood Insurance Study report and determine the BFE by measuring the distance from a known landmark or cross-section along the waterway.

SFHAs without BFEs

For many SFHAs, BFEs are not determined. In these “Unnumbered A Zones” additional data must be sought and, if no other detailed information is available, then approximate methods can be used. Additional data on flood elevations may be available from your Public Works or County Engineer’s Department, the Ohio Department of Transportation (especially near bridges), the U.S. Army Corps of Engineers, the U.S. Geological Survey, and the Natural Resources Conservation Service. The ODNR, Division of Water is the official state repository of flood data and we may have data available that is not published in a FIS or FIRM.

If the site is near the detailed study portion of a stream, it may be possible to extend the Flood Profile to approximate the BFE. Local knowledge of historic high water marks may provide guidance. If all other data sources have been exhausted, review below to learn how topographic maps or simple surveys can be useful. Some communities may

[16] Excerpted and adapted from the Maine Floodplain Management Handbook (April, 2002)

choose to require that applicants have a professional engineer determine the BFE for unnumbered A Zones. One way is to use FEMA's QUICK-2 software. This software uses simple cross section information to set the BFE, and is free when you order a copy of FEMA 265 "Managing Floodplain Development in Approximate Zone A Areas – A Guide for Obtaining and Developing Base 100-Year Flood Elevations" (or you can download it from FEMA's website).

Simplified methods can be used to determine the BFE. One method, called "contour interpolation," uses both the FIRM and available topographic or contour maps. First, you need to overlay the SFHA onto the topo map, which is not always as easy as it sounds. The estimated BFE is the elevation of the ground at the inundation boundary (shaded map area) indicated by the topo map. Remember to watch out for different scales and measure carefully from a reference point (such as a road crossing) to estimate the BFE at the proposed project site. It is also important to understand that this method is only as good as the contour map. To take into account approximations that are inherent in the topo map, FEMA recommends adding one-half of the contour interval to the estimated BFE.

Floodway Boundaries

If a floodway has been shown on the FIRM, you must also determine if proposed development is within the floodway. The horizontal location of the floodway boundaries, not the elevation must be used to determine if a development is within the floodway. If the site is near the floodway boundary, a similar process as described above may need to be used to determine if any portion of the site is in the floodway. In this instance, measuring from identifiable land features located on both the ground and the map will be required. As before, scaling these distances on the map will help determine the location of the site in relation to the floodway boundary. Once again, because the floodway boundary is not based on a flood elevation, measuring in the field and on the map is the only way to locate the site in relation to the floodway. If the site is at a surveyed cross section, floodway width data from the floodway data table in the FIS may be used to supplement the field and map measurements. The width listed in the table is the distance from the floodway line on one side of the stream to the floodway line on the other side of the stream. This is very important if the stream channel is the community boundary, where only part of the floodway is shown on the community's FIRM. If there are no nearby roadways or other distinct features on the FIRM from which to measure, the proportional width of the floodway from the center of the stream can be used to determine the floodway boundary on the ground. If any portion of the building site, proposed grading, filling, bridge or other development is determined to be within the floodway, then the floodway provisions of the ordinance apply.

Detailed FIRM and Flood Insurance Study (FIS)

If you have a detailed FIRM with numbered A Zones, the base flood elevation is on the map. Many of the elevations on the FIRM are rounded to the nearest foot. The standard practice of displaying the base flood elevation on the FIRM is as follows: if the base flood elevation is between 0.1 and 0.4, the elevation is rounded down. If the elevation is

between 0.5 and 0.9, it is rounded up. For insurance rating the rounding is acceptable. For floodplain management purposes and permitting, it is important to use the best or most exact number. What about the areas between the elevations displayed on the map? For riverine floodplains, the FIS typically contains a flood profile. A flood profile is a graphic display of the elevation of a particular flood for the entire reach or the part of the stream that has been studied. Communities with a detailed FIRM have flood profiles in the Flood Insurance Study text.

In an AO Zone, the BFE is shown as the depth of flooding, usually one to three feet in depth. Structures constructed or substantially improved within AO Zones must have the lowest floor of the structure (including basement) protected from flooding to the elevation of the highest adjacent grade (highest ground in contact with the structure) plus the depth number specified in feet on the FIRM (at least two feet if no depth number is specified). You will need to know the location of the building foundation and have a survey of the highest adjacent grade to make a determination of the flood height in AO Zones. It is important to note the lowest floor of the entire building must above the determined flood height. This can be achieved by designing the structure on an open foundation system or on foundation walls with compliant hydraulic openings if permitted within the community's ordinance. It is not permissible to stair step the building down the slope.

New Tools for Making Map Determinations

Now, it is possible to download a copy of a FIRM through the Internet. This process creates a document called a FIRMette, which is a digital copy of the effective FIRM for a community. Many users of flood maps, such as realtors, appraisers and insurance agents, now utilize this tool which should reduce calls to your office for copies of flood maps. For the purposes of administering your community's floodplain regulations, a FIRMette may be helpful in locating a property as a first "cut" to determine whether a proposed development site may be in a SFHA; however, the FIRMette should never be substituted for the use of the FIRM, FBFM and FIS to determine exact flood elevations, floodways, etc. for a site. For more information, visit FEMA's website at http://www.fema.gov/fima and go to the FEMA Flood Map Store.

Similarly, FEMA offers, through the same website above, tutorials on how to read FIRM(s) and FIS(s). The *How To Read A Flood Insurance Rate Map* Tutorial educates users on the use and application of FEMA FIRMs. Each component of the FIRM is explored. The tutorial includes a section that contains examples of getting specific information from FIRMs. The *How to Read A Flood Insurance Study Tutorial* educates users on the use and application of FEMA FIS texts. Each component of the FIS, including profiles, cross sections, and notes is explored and explained.

4.6 CHANGING FEMA FLOOD MAPS AND STUDIES

The flood risk information that is shown on the maps and in the FIS forms the technical basis for local floodplain management regulations. FEMA uses the same information to

set insurance rates. Care is exercised to ensure that the analytical methods are scientifically and technically correct, that the engineering procedures meet professional standards, and ultimately, that the results of the FIS are as accurate as possible.

Although rigorous technical standards are followed, FEMA recognizes that changes may be necessary. Some reasons for change include improvements in the techniques used to assess flood risks, changes in the physical condition of floodplains or watersheds, and the availability of new scientific or technical data. In addition, because many maps are printed at scales of one-inch to 500, 1,000 or 2,000 feet, there isn't enough detail to show every change in the ground. This means what look like "mistakes" may be found, that is, some individual properties may be shown as in the SFHA when they really are on high ground. But remember, the same "mistake" may mean that some properties are shown as out of the SFHA when they really are below the BFE.

FEMA can revise and amend maps and flood studies. FEMA receives requests from community officials, developers, and individual property owners. The technical data used for the study and maps must be used as the basis of a request that will change the boundaries of the flood hazard area, the boundaries of the floodway, or the base flood elevations. Data requests may be submitted through FEMA's web page.

Map Change Processes

To help applicants gather and complete the data necessary for map changes, FEMA has developed application and certification forms. Copies can be downloaded from FEMA's website. Additional detailed guidance on all the map change processes is found in FIA-12, *Appeals, Revisions, and Amendments to NFIP Maps: A Guide for Community Officials*, which can be downloaded from FEMA's web page.

Congress has directed FEMA to recover the cost of some types of map changes, and a fee schedule is published in regulations. If a map is found to be in error, for example when an Elevation Certificate shows that a building site is above (or below) the BFE, there is no fee for FEMA to prepare a Letter of Map Change. However, when a developer proposes changing the floodplain by grading or filling, or if a new study is prepared to contest FEMA's information, then a fee is charged. For more information, visit FEMA's website at http://www.fema.gov/fima and go to the FEMA Flood Map Store.

Appeal. FEMA's normal procedure for publishing new or revised maps includes a formal 90-day appeal period to allow for public review. A challenge to the proposed BFEs is called an "appeal." The changes that result from successful appeals are incorporated into the FIS report, FIRM, and/or floodway map before publication. Appeals to BFEs must be supported by information that proves that the published elevations are scientifically or technically incorrect.

Protest. A challenge received during the 90-day appeal period that does not address BFEs, but questions other information shown on the FIRM such as the street names,

corporate limits, or floodplain boundaries, is termed a “protest.” The changes that result from successful protests are incorporated into the reports and maps before publication.

Map Revision. Modifications to the effective NFIP map that involve changes in BFEs; floodway delineations; or changes in floodplain boundaries due to manmade changes are called “map revisions.” The effective map is the most recent map. Requests to revise the effective maps must typically be supported by a hydraulic (and sometimes hydrologic) analysis performed by an engineer. When a map revision is warranted, FEMA will revise and republish the affected map panels and, if necessary, the FIS report. This is referred to as a “physical map revision.” If the scale of the revision is small, or if it affects only one property, FEMA will issue a letter, referred to as a “Letter of Map Revision” (LOMR). A LOMR, which becomes a legal attachment to the map, describes the changes and officially revises the effective map.

Conditional Map Revision. The NFIP regulations require that engineering analyses be performed for certain proposals that may alter the floodplain, such as flood control structures, waterway alterations, or fill for multiple lots. If the proposed development would result in increases in flood heights during the occurrence of the base flood discharge beyond what is allowed by the community’s regulations, or proposes to change the delineation of the floodway, conditional approval from FEMA is required before the community may issue a permit to construct the proposed development. FEMA reviews the analyses to determine if the proposals are acceptable in terms of floodplain impact and if map revisions will be required if projects go forward. FEMA’s comments are known as “conditional determinations,” and they are issued in “Conditional Letters of Map Revision” (CLOMR) and “Conditional Letters of Map Revision Based on Fill” (CLOMR-F). It is important to note that CLOMRs and CLOMR-Fs are not permits and do not supercede the local permit authority. A local floodplain development permit is still required for proposed projects that have received conditional approval from FEMA. Once construction is completed, a LOMR must be requested to officially revise the maps, based on the as-built conditions.

Map Amendment. Because of the scale of the original topographic maps used to create the FIRMs, some parcels may have been inadvertently included in the SFHA. A map amendment is used if no manmade intervention has occurred, and is how FEMA responds to a request to remove an individual structure and/or a legally described parcel of land from the SFHA. When FEMA determines that a parcel of natural ground or a structure built at the natural grade is actually above the BFE, a “Letter of Map Amendment” (LOMA) is issued. The LOMA applies to only the described structure or parcel, and officially amends the effective map.

Conditional Map Amendment. When an applicant proposes to build on legally described parcels of land that are on natural ground or fill that was placed before the first NFIP map, FEMA may issue a conditional map amendment. If FEMA determines that a proposed structure would be out of the SFHA, a “Conditional Letter of Map

Amendment" (CLOMA) is issued. A CLOMA does not officially amend the effective NFIP map.

Letter of Determination Review. FEMA is required by law to review floodplain determinations when a borrower and a mortgage lender disagree on a floodplain designation made during the loan process. LODRs are issued when the borrower and lender jointly request a determination of whether the structure is located in a SFHA. FEMA has 45 days to respond, and, by law, FEMA's determination is final.

CHAPTER 5: FLOODPLAIN REGULATIONS

Community participation in the National Flood Insurance Program (NFIP) requires the adoption and enforcement of floodplain management regulations that are compliant with Section 60.3 of the NFIP regulations. There are four basic components to these floodplain regulations:

- The areas of the community where the rules apply (the floodplain or "Special Flood Hazard Area (SFHA)") are identified.
- Certain activities in the floodplain are brought under regulation.
- The development standards for these activities are specified.
- A system to administer and enforce the rules is established.

Locally adopted floodplain management regulations must also meet the requirements of state floodplain management laws. In Ohio, these local regulations are most often adopted by cities and villages as a stand-alone, special purpose ordinance, while counties usually adopt a special purpose resolution. Some Ohio communities have adopted floodplain management regulations that are integrated into their zoning codes while others may have specific floodplain regulations as part of their subdivision or building codes.

5.1 AUTHORITY FOR OHIO COMMUNITIES TO REGULATE FLOODPLAINS

The police power is the power of government to regulate public health, safety, morals, and welfare. The police power authority of Ohio counties and townships originates through direct statutory delegation by the Ohio General Assembly instead of through the state constitution, as is the case for municipalities (cities and villages). Ohio communities have the authority to adopt flood damage reduction regulations through the police power.

Counties

Specifically, the statutory delegation, also called enabling authority, for counties to participate in the NFIP and adopt flood damage reduction regulations is found in Sections 307.37 and 307.85 of the ORC. Section 307.37 states:

> *A county building code may include regulations for participation in the national flood insurance program established in the "Flood Disaster Protection Act of 1973," . . .and regulations adopted for the purposes of section 1506.04 or 1506.07 of the Revised Code governing the prohibition, location, erection, construction, redevelopment, or floodproofing of new buildings or structures,*

substantial improvements to existing buildings or structures, and other development in unincorporated territory within flood hazard areas . .

Section 307.85 states:

The board of county commissioners of any county may participate in, give financial assistance to, and cooperate with other agencies or organizations, either private or governmental, in establishing and operating any federal program enacted by the Congress of the United States, or with any such agency or organization that is receiving federal funds pursuant to a federal program, and for such purpose may adopt any procedures and take any action not prohibited by the constitution of Ohio nor in conflict with the laws of this state. . .

The Ohio Attorney General has opined (OAG 91-028) that ORC 307.37 and 307.85 provide counties, as participants in the NFIP, sufficient authority to adopt floodplain management regulations.

Municipalities

Municipal corporations are not limited to authority granted by statute. Instead, they have constitutional authority to "exercise all powers of local self-government and to adopt and enforce within their limits such local police, sanitary and other similar regulations, as are not in conflict with general laws" (Ohio Constitution, art. XVIII, section 3). This is also called "home rule" authority. These municipalities are called non-charter or statutory municipalities. Alternatively, a municipal corporation may adopt a charter and use that device to exercise its powers of local self-government.

Under Ohio law, townships do not have enough home rule authority delegated to them to qualify for participation in the NFIP independently; rather, townships are included under the county's NFIP participation. However, several townships in Ohio with zoning regulations have adopted a zoning overlay district or similar language for floodplain areas. Often these district regulations are more restrictive than the county's flood damage reduction regulations.

5.2 BEYOND THE NFIP MINIMUM STANDARDS

The NFIP has undoubtedly had an impact on flooding by reducing flood damages to structures, but it has not stopped or reversed it. The NFIP's minimum requirements are just that – minimums! The minimums set construction standards that often do not provide sufficient protection from all local flood hazards nor do they account for the effects of urbanization on future flood levels. They will allow floodwater conveyance areas to be reduced, essentially storage areas to be filled, or flow velocities to be increased – all of which can adversely affect others in the floodplain and the watershed. It is important that communities recognize the need to go beyond the national and state minimums and take charge of their own flooding issues.

Ohio communities are taking steps to move beyond the minimum standards. In fact over 1/3 of Ohio communities have floodplain regulations containing higher level standards.

5.3 STATE ASSISTANCE AND *OHIO FLOODPLAIN REGULATION CRITERIA*

The Ohio Revised Code (ORC), Section 1521 directs the ODNR, Division of Water to produce model regulations and provide technical assistance to Ohio communities. Ohio's model regulations are included in this handbook (*see Appendix A)*, and can also be found on our website. The model regulations meet NFIP minimum standards.

Ohio Floodplain Regulation Criteria is a much more comprehensive document that has been produced by the Floodplain Management Program to assist and guide Ohio communities in adopting floodplain regulations. It has been prepared to ensure that Ohio communities have access to floodplain management regulations that are consistent with local, regional, and state goals and that meet or exceed the minimum requirements of the NFIP. It also contains a menu of optional higher level standards that have been adopted by Ohio communities. **It is recommended that if you are considering amending or updating your local floodplain regulations that *Ohio Floodplain Regulation Criteria* be consulted.**

Ohio Floodplain Regulation Criteria was first published by the Division of Water in 1976 and, at that time, contained progressive recommendations for standards that went beyond minimum standards of the National Flood Insurance Program. Through the 1990's, it became evident that those recommendations were important in reducing the risk of lost lives and property damage due to flooding. Today, many of those recommendations have become mainstream as communities in Ohio and nationwide are taking steps to have truly effective floodplain management programs.

Ohio Floodplain Regulation Criteria is meant to serve as a guide to understanding the various criteria that must be addressed in order to manage the natural resources of the floodplain, to adequately protect floodplain development from future flood damages, and to reduce adverse impacts of floodplain development. The Floodplain Management Program is ready and willing to assist communities in adopting or revising floodplain regulations.

5.4 STANDARDS FOR FLOODPLAIN DEVELOPMENT[17]

All across the country, many communities guide development to areas that are not subject to flood hazards. But when development in the SFHA occurs, there are ways to locate and construct buildings on sites to minimize the potential for damage. The NFIP minimum standards for new construction and substantial improvement of existing structures in SFHAs are designed to achieve this goal. To participate in the NFIP, the

[17] Section adapted from the Mississippi Floodplain Management Handbook for Community Administrators

minimum development standards must be adopted by local jurisdictions that have land use authority. 44 CFR 59.22(a)(3) requires, as a condition for participation, that communities adopt the minimum provisions in Section 60.3. The standards must be applied to all **development** and **structures** built or substantially improved in the SFHA.

New Construction

The term **new construction** refers to buildings and other development built after the effective date of the community's first Flood Insurance Rate Map (FIRM). All new construction must comply with the community's flood damage reduction regulations and NFIP minimum requirements. The term **Post-FIRM** is used to refer to buildings that were constructed after the date of the first FIRM (or date of the first regulations) and any substantial improvements after that date. For insurance purposes, Post-FIRM buildings are charged actuarial rates, which are based on factors related to actual risk. The most important factor is elevation of the lowest floor relative to the Base Flood Elevation (BFE). *BFE refers to elevation of the flood having a one percent chance of being equaled or exceeded in any given year. It is also know as the one-hundred (100) year flood elevation.*

Existing Construction

Existing construction or **existing structure** refers to buildings and development that existed before the effective date of the community's first FIRM. This development is also referred to as **Pre-FIRM.** Many existing structures are non-conforming, which means they do not meet the minimum NFIP requirements. However, they are legal and grandfathered until and unless they undergo **substantial improvement** (including repair or restoration of **substantial damage**). For insurance purposes, the cost of NFIP flood insurance for Pre-FIRM buildings is determined using rates that do not account for the full risk, but are cross-subsidized by other policies.

Substantial Improvement And Substantial Damage

Substantial Improvement is when the value of a Pre-FIRM structure is increased through improvements that would equal or exceed 50% of the current market value of the structure before the improvements occurred. To identify a proposed substantial improvement, a floodplain administrator must acquire the market value of the existing structure and the estimated value of any proposed improvements to that structure during the SFHA development permit application process. If a substantial improvement is proposed, the structure must be brought into compliance with the community's flood damage reduction regulations.

Substantial Damage describes damage to a Pre-FIRM structure from any source that equals or exceeds 50% of its market value. Structures that have been substantially damaged must be brought into compliance with the community's flood damage reduction regulations.

ODNR Division of Water has developed *National Flood Insurance Program Substantial Damage Determinations: A Guide for Local Officials* to assist floodplain administrators

in conducting their post-disaster damage assessment responsibilities. Please refer to this manual for detailed information regarding substantial damage assessment.

SFHA Development Permitting Process

The SFHA Development Permit enables communities to evaluate proposed SFHA development for compliance with locally adopted flood damage reduction regulations through a consistent and methodical process. This administrative procedure is discussed further in Chapter 6.

Residential and Non-Residential Buildings

Community floodplain management regulations outline some requirements that are different for residential and non-residential buildings. To properly apply the requirements, the functional use of the structure should be distinguished. The NFIP does not define the terms "residential" and "non-residential." However, the following definition of 'residential' is taken from the American Society of Civil Engineers (ASCE) publication 24, *Flood Resistant Design and Construction*, which defines 'non-residential' as any uses that are not residential:

- Buildings and structures and portions of buildings and structures where people live, or that are used for sleeping purposes, including one- and two-family dwellings and multifamily dwellings;

- Buildings and structures or portions thereof that are used for residential purposes, including but not necessarily limited to boarding, lodging or rooming houses, hotels and motels, apartment buildings, convents and monasteries, dormitories, fraternity and sorority houses, vacation timeshare properties; and

- Residential board and care facilities that are occupied on a 24-hour basis, including assisted living facilities, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug centers, convalescent facilities, hospitals, nursing homes, mental hospitals, detoxification facilities, prisons, jails, reformatories, detention centers, correctional centers, prerelease centers, and other such uses.

Subdivisions

In SFHAs where no BFEs have been delineated, community flood damage reduction regulations require that the 100-year flood elevation is generated for any proposed subdivision or development that exceeds five acres or fifty lots, whichever is less. Acquiring this data helps ensure that large-scale structural development is adequately protected to the base flood elevation. If the proposed development will result in increases to the 100-year flood elevations, the proposed flood elevations should be used to determine the required height of flood protection.

Floodways

The floodway is part of the riverine floodplain that must be reserved in order to convey the base flood. This means that development in the floodway is likely to make flood levels higher and cause more damage. Usually, the floodway is where the water will be deepest and move the fastest.

"No-Rise" Impact Analysis. The NFIP regulations and community flood damage reduction regulations are very clear about floodway impacts. Communities are required to prohibit any encroachments, including fill, new construction and substantial improvements, if they cause any increase in flood levels. This means a hydrologic and hydraulic engineering analysis is required for just about any proposed development activity in the floodway. (Some projects that propose relatively small disturbances to the floodway may be permitted using simplified analyses providing the analysis demonstrates "no rise." Please contact the ODNR Floodplain Management Program for additional guidance regarding simplified floodway encroachment analysis.) In the extremely unusual and rare case that a community wishes to permit a floodway proposal that could increase the BFE, a Conditional Letter of Map Revision (CLOMR) and floodway revision must be reviewed and issued by FEMA prior to issuance of a SFHA development permit. Until a CLOMR is granted by FEMA, a SFHA development permit should not be issued and development should not begin.

Allowable Uses for Floodways. Although communities should review each floodway proposal carefully, there are some land uses that can be allowed without extensive engineering analysis as long as they don't include filling and grading that changes the shape of the land. Those uses include:

- Agricultural uses not involving structures;
- At-grade uses such as parking and loading areas, airport landing strips;
- Recreational uses, such as hiking, biking, and horse trails, wildlife and nature preserves, and hunting and fishing areas;
- Recreational uses (where improvements are anchored to prevent flotation), such as picnic and play grounds, ball fields, boat launching ramps, swimming areas, target shooting ranges, and golf courses and driving ranges without major grading; and
- Uses incidental to residential buildings, such as lawns, gardens, parking areas, playgrounds and tot lots.

Public Works and Road Crossings

When it is necessary for development activities to cross a watercourse, such as bridges, roads, driveways, and utility crossings, there is possibility that the floodway cannot be reasonably avoided. In these cases, communities should require designs that minimize

encroachment, which must be supported by an engineering analysis. If the project cannot be designed to cause no rise in flood levels during the occurrence of the base flood discharge, a Conditional Letter of Map Revision (CLOMR) must be obtained from FEMA prior to issuance of a SFHA development permit. Until a CLOMR is granted by FEMA, a SFHA development permit should not be issued and development should not begin.

Where floodways are fairly narrow, the best approach is to have bridges and culverts sized to span the entire floodway width.

Wastewater treatment plants are often located in low-lying areas to take advantage of gravity flow. Water treatment plants that draw from surface water also tend to be located near rivers or lakes. When new facilities are planned, communities should require consideration of alternatives that avoid the floodway entirely. If the facilities must be located in the floodway, the portion of the project that encroaches on the floodway must be designed to cause no increase in flood heights during the base flood discharge. An analysis of impacts must be performed, and the facilities must be floodprotected to prevent damage, interruption of service, and health hazards during flooding. If the project cannot be designed to cause no rise in flood levels during the occurrence of the base flood discharge, a Conditional Letter of Map Revision (CLOMR) must be obtained from FEMA prior to issuance of a SFHA development permit. Until a CLOMR is granted by FEMA, a SFHA development permit should not be issued and development should not begin. ODNR recommends that wastewater and water treatment plants located in SFHAs are floodprotected at least two feet above the base flood elevation.

Protecting Utilities

FEMA has developed an extremely useful manual *Protecting Building Utilities from Flood Damage* (FEMA 348) to assist floodplain administrators and property owners to ensure adequate floodprotection to utilities.

Public Utilities. Because of high replacement costs and potential health risks, communities participating in the NFIP are required to ensure that all utility service lines be located and constructed to minimize or eliminate flood damage. Utilities include sewage, gas, electrical, and water systems. In riverine floodplains, most flood damage to public utility lines occurs where they cross under waterways, or if they are parallel to waterways but too close to eroding stream banks. It is suggested to require the top of utility crossings, including casements, to be at least 3' beneath the lowest part of the streambed. In areas with very erodible soils, it is safer to be even deeper. Utility lines that follow waterways should be at least 25' back from the top of bank (even further in areas with highly erodible soils). Stream bank protection such as riprap or gabion (rock filled wire baskets) may be required if velocities are expected to be erosive. Buildings associated with utilities, such as treatment plants, pump/lift stations, or other installations, must comply with the local floodplain management regulations. Communities may consider requiring at least one foot of freeboard (preferably 3 feet) for construction of new buildings that provide critical utility service. Water distribution

systems must be designed and constructed to minimize or eliminate the infiltration of floodwaters. Sewage collection lines and manhole covers must be sealed to prevent leakage under flood conditions.

Private On-Site Utilities. On-site waste disposal systems such as septic tanks and septic fields must be located to avoid impairment or contamination during flooding. The best way to minimize impaired functioning is to locate them outside of the SFHA. If unavoidable, you must require that tanks be anchored adequately to prevent flotation or shifting that could damage pipe connections. Septic-tank inlets and outlets must be elevated above the BFE or sealed to prevent inflow/outflow under flood conditions. In some areas, installing a mound system may work, although surrounding saturated ground will still complicate drainage (mound systems require fill and should not be located in floodways). Private water supply wells are very susceptible to contamination during flooding. According to the Ohio Department of Health (ODH), wells should be located outside of the SFHA. If this is not feasible, permission must be obtained from ODH to locate the well within the SFHA. Homeowners will need to be prepared to purify their wells and distribution systems when contaminated by floodwaters.

Utility Service in Buildings. In residential buildings, all plumbing, mechanical, and heating and air conditioning components must be elevated to or above the BFE, including toilets, sinks, showers, water heaters, furnaces, heat pumps, air conditioners, air distribution systems, generators, and other permanent plumbing, mechanical, and electrical installations.

In non-residential buildings flood protection of the structure may be accomplished by elevating the structure and utilities or by dry-floodproofing the building to the BFE. When dry-floodproofing is utilized all utilities entering the building below the BFE must be designed to prevent seepage through the wall or floor penetration as well as to prevent backflow of floodwater into the structure.

Appliances and machinery can be located in approved enclosures below BFE, but only if they are elevated on platforms to provide floodprotection to the BFE. Heat pumps outside of the building must be elevated above the BFE. This is most easily done by building a platform or a small deck cantilevered off of the building. Vents and heating/air conditioning ductwork are often installed incorrectly in buildings in the SFHA. The most common reason is because the minimum elevation requirement for buildings calls for the walking surface of the lowest floor to be at the BFE. Since duct work usually is installed between the joists under the floor, it can end up being below BFE. Even when floodwaters just touch the duct insulation, costly damage results. Duct work below the BFE is a violation of community flood damage reduction regulations. Electrical equipment, switches, and outlets on the building side of the meter must be elevated. Since a specialty contractor usually handles the electrical work, be sure the plans show the required elevation.

In existing buildings with basements that are constructed in or near floodplains, backflow of floodwaters into the buildings may occur through a floor drain, toilet, sink, sump pump, etc. that is below the height of the floodwater. Backflow from a flooded sewer system may affect buildings that are far away from the mapped floodplain. For instance, a typical sanitary sewer manhole that is not protected against infiltration and is submerged by one foot of floodwater may submerge the sanitary sewer system for nearly half a mile surrounding the manhole (based on an 8" pipe diameter installed at a slope of 0.45%, 10 feet deep). Any building on the system with a drain or toilet below the elevation of the floodwater at the manhole will experience backflow as the floodwater seeks to fill the lowest points in the system. In some situations, installation of backflow valves may be utilized to prevent this kind of damage.

Backflow valves can be installed on sewer connections for individual buildings or can be installed on the main sewer lines to protect multiple users. Installation of backflow prevention should only be done under the guidance of a qualified design professional. If building foundations are not designed to withstand the additional pressures that may be created by saturated soils during conditions of flooding (which most common foundations are not) damage to the building from collapse of the walls, buckling of the floor slab, or uplift resulting from buoyancy may result.

Electric Meters. Electric companies control the placement of electrical meters, which are outside of the building. This means meters may not be fully elevated, which could delay restoration of service. Floodplain administrators should contact the companies that serve their communities and request they install meters and transformers at least one-foot above the BFE.

Elevators. Elevators may be installed in elevated buildings, and clearly they must be accessible from ground level. Appendix C includes Technical Bulletin 4-93 *Elevator Installation*.

Methods To Elevate Buildings

A Zones. When buildings can't be located outside of the SFHA, they must be floodprotected to or above the BFE, wherever the BFE has been determined. Residential structures may be floodprotected only through elevation of the lowest floor to or above the BFE while nonresidential structures can be elevated or dry floodproofed. The most common ways to elevate buildings are on fill, on solid foundation walls surrounding crawl spaces, or on posts, pilings, or columns. Elevated buildings will be surrounded by water during a flood, so communities should check with their local emergency management agency or the police and fire departments before approving large flood-prone subdivisions. Emergency response personnel are responsible for evacuating threatened areas, so it is important to consider their comments.

Elevation on Fill. Compacted fill can be placed to raise a building pad above the BFE. Good fill material must be used, and the fill must be compacted to reduce the chances that floodwaters will cause saturated soils to slump and fail when water recedes.

Graded side slopes typically should be no steeper than 2:1 (two feet of horizontal for every one foot of vertical height), and planted with tightly growing vegetation. Compacted fill should extend 10-15 feet around the building.

Sometimes an applicant proposes placing floodplain fill in order to excavate a basement into it at a later date. A basement is any area, regardless of how it is used, that is below grade on all sides. **The NFIP standards do not allow basements below the BFE and communities should not approve permits for basements in fill.** Even when excavated into fill, basements may be subject to damage, especially in floodplains where waters remain high for more than a few days. Damage may also occur when fill materials become saturated and inadequately support the building or water pressure collapses basement walls. Sometimes people want to obtain from FEMA a Letter of Map Revision based on Fill (LOMR-F) in order to remove the flood insurance requirement. The LOMR-F is the only way to officially remove a properly filled site from the mapped flood hazard areas. To qualify, the fill must be adequately compacted and otherwise determined to provide adequate protection so that the building on the fill can be certified a "reasonably safe from flooding". "As-built" certification is required by FEMA as part of supporting documentation for a LOMR-F.

Elevation on Solid Foundation Walls. Solid foundation/perimeter walls may be made of poured concrete, pre-fabricated concrete slabs, or reinforced or unreinforced masonry block or brick construction. Solid foundation walls extend around all sides of the building. The foundation walls must have a minimum of two openings on different sides of each enclosed area. The total area of the openings must be sized to accommodate one square inch for every square foot of enclosed space and the bottom of each opening must be no higher than one foot above grade. These can be covered with louvers, screens, or ventcovers that do not impede the automatic flow of water into and out of the enclosed area. In lieu of use of openings as listed above, the foundation could be designed and certified by an engineer or architect to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters.

Elevation on Posts, Columns, Piers or Pilings. Posts or columns are usually wood, steel, or prefabricated concrete/masonry supports that are placed on footers in pre-dug holes and backfilled with compacted material. Piers are usually constructed in place of reinforced masonry block or brick. Pilings are usually long and slender in shape and are driven or jetted into the ground by mechanical means. They often appear similar to telephone poles or may be small-diameter concrete poles or steel members.

Parallel Shear Walls. Often seen for large buildings in coastal areas, parallel shear walls are a reasonable alternative for riverine floodplains. They are especially applicable where easy-access parking under a building is a plus. They should be constructed parallel to the expected flow of water to minimize obstruction. Parallel shear walls are one-dimensional, they do not enclose an area and they do not "turn corners."

CHAPTER 6 ADMINISTRATIVE PROCEDURES

6.1 THE ROLE OF THE FLOODPLAIN ADMINISTRATOR

The NFIP requires that each community designate a local office or official to be responsible for administration and enforcement of the floodplain management regulations. As the local floodplain administrator, you have many responsibilities. While certain tasks may be delegated to other staff, such as permit clerks or inspectors, it's up to you to make it all happen the right way. The following are all part of the responsibilities that your community assumes to participate in the NFIP – and that you are charged with implementing in order to preserve your community's "good standing" in the NFIP:

- **Administer a complete and thorough permitting process for all development in SFHAs.** Such a process leads to the review of all applications for development in SFHAs, interpreting floodplain boundaries and providing flood elevation data, permit issuance or denial, keeping all records pertaining to the permit file, advising applicants of other state, federal or local permits that may be necessary, inspecting floodplain development, reviewing hydraulic and hydrologic analyses that may be required, and requiring as-built certifications as necessary.

- **Lead or participate in other related administrative processes including variances/appeals, enforcement, and post-disaster substantial damage assessments.** These processes, although they may not happen often, are important to the success of a local floodplain management program. Failure to understand and do these processes correctly can lead to undermining of your community's efforts to reduce flood damage and can possibly lead to sanctions by FEMA.

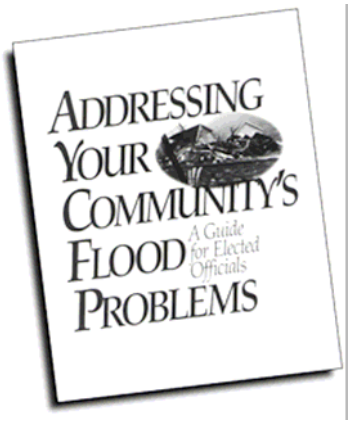
- **Participate in map maintenance and NFIP participation activities.** These activities include notifying FEMA of changes in municipal boundaries, completing the FEMA Biennial Report Form, and participating in Community Assistance Visits or Contacts.

6.2 THE ROLE OF ELECTED OFFICIALS

Elected officials have some procedural responsibilities when it comes to a community's participation in the NFIP. First, it is up to the elected legislative body to amend or update the community's flood damage reduction regulations. Updates may be triggered by the issuance of new flood maps or periodic changes to the NFIP. Next, elected officials must appoint members to the Appeals Board where a community's regulations indicate a need to do so (for example if the flood damage reduction regulations specify

that Appeals Board is an existing Board of Zoning Appeals, then individual appointments aren't necessary).

Elected officials should also make sure that floodplain management goals are consistent with community-wide planning and development goals and guidelines. Lending support (including allocating resources) to the local administrator will help smooth the permitting process. Elected officials also play a key role in informing the public about flood hazards and how to obtain information on flood insurance, building permits, and ways to make homes and businesses safer.



In 1996, a joint project of the Association of State Floodplain Managers, and the Federal Interagency Floodplain Management Task Force produced *Addressing Your Community's Flood Problems: A Guide for Elected Officials*. Complete with descriptions of real situations, this guide outlines how floods can affect communities, what elected officials can do before a flood, situations that come up after a flood, and resources available to help. You may download a copy of this publication from the ASFPM website at: www.floods.org

6.3 THE PERMIT PROCESS

To participate in the NFIP your community must establish and maintain a program to review proposed development and issue permits to regulate all development proposed for the SFHA (44 CFR 60.3(b)(1)). Every development proposal must be reviewed to determine whether it is located in the SFHA. For the NFIP, **development** covers storage of equipment and materials, subdivision of land, site work, and construction. If your community has a building code, you cannot rely entirely on the building permit to satisfy the NFIP because the code does not cover all development. Generally building permits are issued only for structures – the floodplain development permit is issued for everything that alters the floodplain, including:

- Man-made changes to improved or unimproved real estate (land), including but not limited to mining, dredging, filling, grading, paving, excavating, drilling operations, and temporary or permanent storage of equipment or materials.

- The type and placement of new buildings and other structures including tanks, accessory structures, and manufactured homes, and the methods of construction.

- Additions, repairs or renovations to existing structures, when such actions are classified as substantial improvements.

- Repair and restoration of existing buildings that have been substantially damaged by any cause (flood, fire, wind, tornado, and other damaging events).
- Installation of water and sewer utilities, and other site improvements.

- Construction or modification of flood control works, including levees, floodwalls, and channels.

- Construction, modification or replacement of roads, bridges, and culverts.

- Any related activities that may affect the special flood hazard area, especially those activities that may increase the level of the 100-year flood.

Coordination with the Ohio Building Code

Even though multifamily (over 3 family), commercial and industrial structures are regulated statewide under the Ohio Building Code (OBC), the code clearly states that the owner of the building is responsible for compliance with local flood damage reduction regulations. The OBC, updated to be consistent with ICC International Building Code, does contain basic requirements for making sure a building is flood resistant; however, the process set up under the OBC allows for "concurrent jurisdiction" which means that proposed construction subject to the OBC requirements also are subject to local floodplain regulations. *So, although there will be some level of floodplain review for a building permit, communities must make sure that these structures are also subject to the community's permit process for floodplain development.*

Floodplain Development Permit Application

A sample permit application is located in Appendix B. You can tailor this to meet your needs – just be sure to capture all of the critical information that you'll need to complete a thorough review for consistency with your ordinance. Appendix B also includes a sample permit review checklist.

Remember that development activities that don't involve buildings must also be issued a permit. Floodplain matters must be addressed during the subdivision review, and proposals to alter waterways will require additional information from the applicant. It's important that you flag all floodplain permit applications (and issued permits) to facilitate review, inspections, and file maintenance. One way to do this is to mark "FP" on files and the face of issued permits; another way is to use a different color folder. A separate log or database of floodplain permits will make it easier for you to complete FEMA's Biennial Report, and it will make your Community Assistance Visits go more smoothly.

Determining When a Floodplain Permit is Needed

Every permit application must have enough detail so that you can check to see if the proposed development is in, or out, of the Special Flood Hazard Area. Site plans must include scaled drawings to show the location of proposed activities and distances to landmarks such as road intersections and road crossings over streams. Your

regulations and the application form should clearly specify certain information that must be included in applications. Specifically, site plans should show property lines, locations of existing and proposed structures, locations of streams and bodies of water, SFHA boundaries, floodway boundaries, Base Flood Elevations, existing and proposed ground elevations, proposed building elevation (lowest floor, including basement), and existing and proposed roads. You might find it valuable to have a pre-application meeting during which you should go over all of the requirements, especially the importance of the foundation inspection and confirming the as-built elevation of the lowest floor as soon as it is built.

When you receive an application, even if the site plan does not include floodplain information, you should check your flood maps. You might find that some proposed development will be in the floodplain, but the applicant was not aware of the rules. You may also find that some applicants have misinterpreted the maps and incorrectly transferred SFHA and/or floodway boundaries or BFEs. It is good practice to have the applicant obtain a survey the lowest ground or grade next to the proposed foundation. Another good practice is to establish a temporary benchmark on the construction site so that the builder can easily check the elevation during construction of the foundation.

The SFHA boundary on the FIRM may conflict with field topography. If the actual *natural* grade is below the Base Flood Elevation, the land is subject to flooding and it is reasonable for you to regulate it as SFHA. If the *natural* grade at a site is above the Base Flood Elevation, then you may determine that the proposed development is not subject to the floodplain requirements. However, even if the ground is high, as long as the FIRM shows the area as SFHA, then banks and lenders may require owners to buy flood insurance. The best thing to do is to recommend that the property owner request a Letter of Map Amendment (LOMA) from FEMA (see Section 4.6 Revising FEMA Flood Maps and Studies). A LOMA is the only way to officially remove the floodplain designation from a lot that is naturally above BFE. With a LOMA, the owner has sufficient evidence to convince lenders to not require flood insurance.

The Application Review

An application for development in a floodplain has been turned into your office. You have confirmed that a floodplain development permit is needed, and are now ready to review the application for compliance with your community's flood damage reduction regulations.

Use a review checklist. Appendix B contains a sample permit review checklist. Using checklists can help you review each permit application the same way and help make sure details aren't overlooked. Keep a copy of the checklist in the permanent permit file to document your review.

Determine if the permit application is complete. A complete permit application is important. It is essential to obtain correct flood hazard information from FEMA's map products. After you decide the application has adequate and acceptable information,

you should complete the review steps, including: determine whether the development is in the SFHA and floodway; determine the BFE; avoid and minimize impacts; review proposed structures; and impose appropriate conditions. Keep in the application file a copy of the FIRM that you used to make your determination. If an application is not complete, it should be returned to the applicant with clear instructions as to what additional information is needed.

Determine the BFE and floodway boundary. Chapter 4 details how to use FIRMs to determine BFEs and floodway boundaries. You should confirm BFEs and floodway boundaries supplied by an applicant.

Determine when additional permits may be required. Your regulations require that the applicant obtain other local, state and federal permits that are required. Copies of those permits must be included in your permit file. Appendix D contains a fact sheet about permits that may be needed for projects in or near watercourses. You should have a basic understanding of the U.S. Army Corps of Engineers' Section 404 permitting requirements, and state regulations governing development.

Reviewing plans and drawings. It would be preferable for every permit application to be reviewed by someone who has experience reading site plans and construction drawings. However, in many communities this is not possible. There are some key things to be looking for. Detailed building plans should show the proposed method of elevation and must specify the proposed elevation of the lowest floor(referenced to the datum on the FIRM).

It is especially important that the plans show that utilities will be elevated. For enclosures below elevated buildings, the drawings and specifications must clearly address the following: flood openings (A Zones); that enclosed areas below BFE are to be unfinished; that enclosed areas are designed for limited and specific uses; and that flood resistant materials below the BFE are specified.

Reviewing special certifications and analyses. In certain cases, the minimum standards of the NFIP, as well as your community's ordinance or resolution will require that an engineering analysis of hydrologic and hydraulic conditions be conducted. The purpose of the analysis may be to ensure that proposed structures are constructed in a manner that is reasonably safe from flooding. It could also be to ensure that impacts resulting from construction do not exceed certain allowable limits as specified in your ordinance or resolution. Typical scenarios that will trigger the need to perform the analysis are as follows:

- **Floodway impact analysis** - A proposed project encroaches into a regulatory floodway. An analysis by a professional engineer demonstrating the effect of the portion of the development that is within the floodway must be performed. Encroachment within the floodway must result in *no* additional increases to flood heights during the occurrence of the base flood discharge (100-year rate of flow).

This means that even a rise of .01 foot is not acceptable. The analysis should be based on the effective engineering model, typically available from FEMA, that was used to create the Flood Insurance Study and Flood Insurance Rate Map. It is recommended that the "no-rise" certification form found in Appendix B is completed by the applicant's engineer and submitted with the analysis. Beware of analyses that have statements like "no significant rise was noted" or a "negligible rise was seen." These do not mean zero rise and are not acceptable.

- **BFE/no floodway impact analysis** - A proposed project encroaches into a floodplain where FEMA has determined the base flood elevations, but has not delineated a floodway. An analysis by a professional engineer demonstrating the effect of the proposed development, all previous development, and all reasonably anticipated future development must be performed. The cumulative impact of all development must not increase base flood elevations by more than one-foot at any point (some communities have adopted a more restrictive rise such as .5 or .1 foot). The analysis should be based on the effective engineering model, typically available from FEMA, that was used to create the Flood Insurance Study and Flood Insurance Rate Map.

- **Alteration of watercourse impact analysis** - A proposed project alters a watercourse in <u>any</u> FEMA identified Special Flood Hazard Area (100-year floodplain). This applies to both detailed and approximate flood hazard areas. An analysis by a professional engineer must be performed showing that the alteration to the watercourse will not reduce the flood carrying capacity of the watercourse.

- **BFE determination** - A proposed project in a Zone A area (no base flood elevations determined) that either exceeds 5 acres or consists of a subdivision of more than 50 lots, whichever is greater. A hydrologic and hydraulic analysis must be performed by a professional engineer to establish the base flood elevation. If the development alters the floodplain in any way, the analysis must establish the proposed conditions base flood elevation.

Upon community request, the ODNR, Division of Water will review the above impact analyses for reasonableness and to determine that the analyses were conducted in accordance with standard engineering practice.

<u>Special Considerations During Permit Review</u>

Included here are some suggestions about how you can handle certain situations during the review process.

Manufactured Homes. Manufactured homes in floodways are extremely vulnerable and should be discouraged. You are encouraged to work with owners to find safer sites outside of the SFHA, or at least to place them where the flood hazard is reduced. Where placement is unavoidable, units should be installed so that they are parallel to

the direction of flow to minimize obstruction of floodwaters. The anchoring, tie-down, and permanent foundation requirements for manufactured homes must be clearly outlined in the permit. **Do not rely on manufactured home installers to know how to place units in flood-prone areas.** The method of elevation and anchoring should be described, including the materials that are approved for use. Remember, if the unit is placed on a solid perimeter foundation, flood openings must be installed. Even standard skirting will be damaged under flood conditions. If you see many applications to place manufactured homes in SFHAs, then your reference library should include FEMA-85, *Manufactured Home Installation in Flood Hazard Areas*

Subdivisions. Subdivision applications should be carefully reviewed to ensure that floodplain impacts are avoided where possible, and if unavoidable, impacts must be minimized as much as possible. One way to do this is to put building pads on high ground and keep the SFHA as open space where possible. These days, many people think wooded streams are attractive and actually increase the value of the lots.

Subdivision layouts can avoid SFHAs. If a subdivision is proposed in an SFHA where BFEs are not determined (unnumbered Zone A), then your regulations have another requirement. Subdivisions that are more than 50 lots or more than 5 acres in size must include BFEs. This means you will have to require that the applicant have an engineer develop this data. Approximate methods (contour interpolation as described in Chapter 4) are not acceptable for determining BFEs to satisfy this requirement.

Utilities in new subdivisions are to be designed and protected to reduce flood damage, including gas lines, water lines, and sewer systems. They should either be located out of the SFHA or designed and constructed to withstand the forces of flooding, especially buoyancy or disruption due to erosion. Due to the potential for contamination, sewer systems (especially manholes) should be sealed to prevent outflows during flooding conditions. Drainage improvements in subdivisions must also be designed and constructed to minimize flooding and diversion of water onto building sites.

Plan reviewers should determine whether flood-free access to the subdivision is available for evacuation, rescue, fire, and emergency medical purposes. You may decide that a road has to be elevated to make sure your community can provide vital emergency services.

Floodproofing Non-Residential Structures. Floodproofing of nonresidential structures is an alternative to elevation. It's important to think carefully about floodproofing, especially when measures such as flood barriers must be installed. This could get tricky if the developer is not the same as the future occupant, if the property changes hands, or if someone is not on-site all the time.

The application must include a design certificate prepared by a registered professional engineer or architect. FEMA's Form 81-65, *Floodproofing Certificate for Non-Residential*

Structures is recommended and can be found on the FEMA website. It must be signed and sealed by a registered design professional. This is the only way to document that the structural design, specifications and plans meet accepted standards of practice.

You should advise owners to keep the *Floodproofing Certificate* with the deed to their property. In the future, it may be necessary to provide evidence to FEMA when the building is rated for insurance purposes.

AO and AH Zones. Applications for activities in AO and AH zones should be checked to be sure the applicant is using the correct elevation. FEMA does not define the BFE in AO and AH zones on the FIRM, but specifies a "depth number." Development in these zones must have the lowest floor (including the basement) elevated above the highest adjacent grade at least as high as the depth number. Non-residential structures may be elevated or floodproofed. If a depth number is not specified, a 2-foot flood protection level is assumed. AH Zones have shallow and/or unpredictable flow paths with depths between 1 and 3 feet, and are often subject to ponding.

Acting on the Permit Application

After the floodplain administrator completes the permit review, there are two options for action:

1. Approve the Permit if the application, construction plans and documents describe development that will be built in compliance with the floodplain regulations.

2. Deny the Permit when a proposal violates the floodplain regulations. The causes for denial should be explained in writing.

An applicant who has been denied a permit has four courses of action:

1. The project may be redesigned to make it compliant and resubmitted.

2. If the applicant feels that the official made a mistake or has misinterpreted the regulations, an appeal to the board of appeals may be made.

3. If the applicant believes the regulations imposes a unique hardship on the proposed development, a variance may be requested (see discussion on variances later in this chapter).

4. Relocate the project out of the floodplain.

Inspection of Development

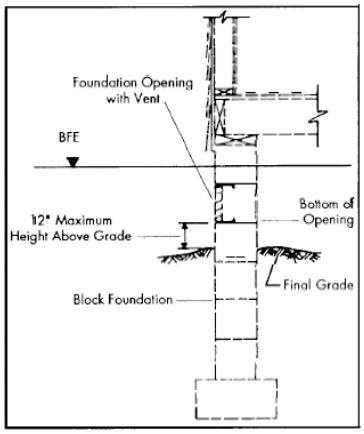
Once a permit is issued, the floodplain administrator is still responsible to ensure that the project is built according to the approved plans. This can be done by one of two methods. The easier method is to tell the applicant to have an engineer inspect the project and certify to the community that it was done in accordance with the regulations.

For some very technical projects, such as a floodproofed factory, this method is definitely preferable.

However, in most cases such an expensive method is not warranted. Development projects including elevated buildings or building elevated on fill can be inspected by the floodplain administrator, but require an Elevation Certificate completed by someone with a professional seal, such as a Professional Land Surveyor, architect, or engineer. When the development is a new building or a substantial improvement, at least three inspections should be made:

1. After the foundation is staked out but before construction is begun, setback out of the floodway, filling and other site requirements are checked. The builder should not start the foundation until this inspection has been successfully passed.

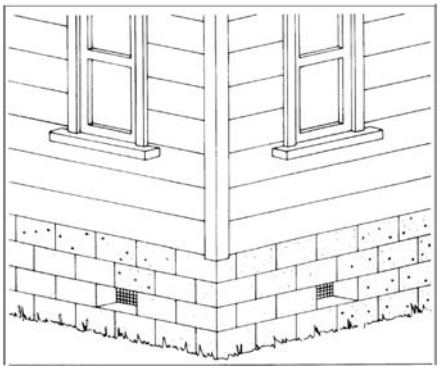
2. When the foundation is completed, the lowest floor elevation is inspected and an as-built Elevation Certificate may be obtained from the owner (see discussion below on obtaining as-built certifications). The builder should not proceed with the walls or floor until this inspection has been successfully passed. If the floor elevation is not high enough, the permit may be revoked until the building is corrected. If the foundation requires the installation of flood openings or vents – check both the placement and number of these openings carefully! This is one of the most common mistakes that is made in floodplain construction and can lead to the building being declared non-compliant with local regulations and the homeowner paying a penalty (and much higher) flood insurance rate.



3. When construction is completed the floodplain administrator must verify that the building meets all the requirements of the regulations. During the final inspection, you need to check the following:

   - Verify that utilities and other building elements have been properly located above the BFE. Things that are frequently overlooked include electrical outlets, plumbing fixtures, and duct work that most contractors install under the floor (and thus may be non-compliant because they're below the BFE).

   - In A Zones, inspect all enclosures below the lowest floor carefully to make sure the flood openings are correct in number and placement. If standard



ventilation units are used, the louvers or slide closures must be disabled so that floodwater can automatically enter and exit freely.

- For enclosed areas below BFE, check that the approved use (parking, limited storage, building access, crawl space) appears to be consistent with what has been built.
- Check that fill has been placed according to the plans.
- For solid foundation walls, make sure the exterior grade is at or below the interior slab or earthen crawl space.
- Verify that flood-resistant materials are used below the BFE, and that the walls and floors of approved enclosures are not finished.
- Collect the as-built Elevation Certificate from the builder/owner if it has not been already collected.
- Document compliance in the final inspection report.

Other minor development projects may be completed with fewer inspections. Documentation of inspections is an important part of your permanent permit records, especially to demonstrate your community's commitment to floodplain management and its good standing in the NFIP.

Obtaining an As-Built Elevation Certificate is extremely important! It should be collected at the final inspection or may be collected prior to the issuance of a use or occupancy permit. The as-built elevation certificate is used to show that the structure is compliant with local regulations during a Community Assistance Visit and is used for insurance rating.

Use or Occupancy Permit

Some communities require that a new building cannot be used or occupied without a use permit or a "certificate of use and occupancy." The floodplain administrator would not issue a use permit until the building could pass the final inspection.

Fees

It is a reasonable practice for communities to require that the owners of projects in the flood hazard area bear the cost of the permit system. However, a building permit system should not be viewed as a lucrative source of revenue for the community. Maine law limits permit application fees to be reasonably related to the costs of administration. Fees should be set to pay for the salary of the enforcement officer and expenses of administration.

Some options may be:

1. Assess a fee that is a percentage of the proposed project's value, (i.e. $1/$1000).

2. Set fees according to monetary thresholds based on the value of the proposed project.

3. Examples:
   $10 - project value < $1,000
   $20 - project value > $1,000 but < $10,000
   $30 - project value > $10,000 but < $25,000
   $40 - project value > $25,000 but < $50,000
   $50 - project value > $50,000

4. Establish a set fee for all projects.

5. Some larger towns or cities may want to consider assessing fees based on the amount of time required to process the application.

Future Inspections

You should occasionally drive through Special Flood Hazard Areas to look for unpermitted activity. Many property owners do not know they're supposed to get permits for additions and substantial improvements. If you find unpermitted activity, you must inspect it, and, if required by your local regulations, the owner must be required to obtain a permit. If a permit cannot be issued for the work that has already been performed, it might mean removal of unpermitted, non-compliant work. If enclosures below BFE were converted to living space, they must be returned to compliant condition.

Maintain Permanent Records

Part of your community's commitment to the NFIP is to maintain permanent records and to make those records available upon request. In addition, complete permit files should be retained because they will be researched during a Community Assistance Visit. Files also become important when making substantial improvement determinations, especially after major damage when you need to document the pre-damage conditions.

Permanent files should contain:

- The permit application (or variance request), including special notes, copy of the FIRM panel, determination of BFE, correspondence, and considerations during review, and the review checklist (if used).

- For variances, the staff report, documentation of the considerations of the Variance Board, and required notifications to the property owner,

- Pre-construction certifications and analyses("floodway no-rise", nonresidential floodproofing),

- As built Elevation Certificate,

- FEMA Letter of Map Change (if applicable),
- The issued floodplain permit (and building permit, if applicable), and
- Documentation of inspections.

It is also a good idea to maintain a readily accessible log of floodplain permit actions. It will be valuable during Community Assistance Visits when the State needs to pull a sample to review. And when FEMA requests data for the Biennial Report, a log will make it very easy to respond. Your log should record the permit number, property address, flood zone (including floodway), nature of work (building, utilities, fill, etc.), and that an Elevation Certificate is on file.

6.4 APPEALS AND VARIANCES

A community participating in the NFIP must have the ability to hear appeals and variance requests to their flood damage reduction regulations.

An **appeal** is filed when a permit applicant disagrees with a decision made by the floodplain administrator. For example, if an applicant disagrees with a zone designation made by the floodplain administrator (such as whether the development is located in the SFHA) such person might file an appeal. A **variance** is a request to relax a particular standard in the community's flood damage reduction regulations. Applications for both appeals and variances can be made and they are decided on by an Appeals Board (some communities may also call this body a variance board). Appendix X contains a sample application and decision record form. The Appeals Board then decides on the request at a hearing where the applicant is given the opportunity to present information to the board.

Similarly the floodplain administrator has the responsibility to act in a technical capacity to the Appeals Board and be prepared to discuss the merits of each appeal or variance. The best way to do this is to prepare a "staff report" which contains a brief background of the issue, pertinent regulatory issues and a recommendation of approval or denial based on the facts of the application and the regulations. If an applicant is denied an appeal or variance, they may appeal under Chapter 2506 of the Ohio Revised Code. It is extremely important to keep all record pertaining to a variance or appeal in the permit file. FEMA or the State will check variances during Community Assistance Visits.

FEMA Region V has developed a document that contains valuable information for local officials who are faced with an issue that may require a variance. It is recommended that each person who sits on the Appeals Board receive a copy of these guidelines. This document is included in Appendix E of this handbook.

6.5 ENFORCEMENT

WARNING! *THE FOLLOWING SECTION ON ENFORCEMENT IS NOT LEGAL ADVICE ON ENFORCEMENT; IT CONTAINS BACKGROUND, GENERAL PRINCIPLES, AND RECOMMENDATIONS FOR BUILDING AN ENFORCEMENT PROGRAM. LEGAL ADVICE SHOULD BE OBTAINED FROM YOUR COMMUNITY'S LEGAL COUNSEL.*

Communities participating in the National Flood Insurance Program have the responsibility to both administer and enforce their flood damage prevention regulations. Upon joining the NFIP, the federal government (through FEMA) agree to make federal flood insurance available in exchange for a community's commitment to administer and enforce its regulations. Although it may be uncomfortable, taking appropriate enforcement actions is necessary for any land use regulation to work properly. **The primary goal for enforcement is achieving compliance with floodplain regulations including the remedy of any violation.** Although fines and other penalties may occur, because a violation can either cause harm or damage to the development itself or an adjacent property, it is important that violations be remedied. In fact, FEMA's standard for communities participating in the NFIP is to remedy violations to the "maximum extent practicable."

Administration vs. Enforcement

Administration of flood damage prevention regulations essentially covers much of the day-to-day aspects of having a floodplain management program. Administration includes permit application review, the issuance of floodplain development permits, site inspections, flood map maintenance activities, meetings with applicants, variance issues, and other duties. Enforcement is a response by a community to an actual or alleged violation of the flood damage prevention regulations. Enforcement actions can range from writing a notice of violation to taking a violator to court. Enforcement is an active response.

Taking enforcement actions will:

- Maintain the credibility of a local floodplain management program. Enforcement can minimize or eliminate the excuse ". . . my neighbor was allowed to do it, so I thought it was OK." Not taking enforcement actions can make local flood damage prevention regulations ineffective in a short period of time if an attitude, such as "we can do as we please because the community doesn't enforce its regulations," takes root and flourish;

- Minimize the possibility a community official(s) could be held liable for failure to do anything about a violation. Ohio communities have been taken to court over their failure to enforce their floodplain regulations and there could be some liability on the part of local officials that knowingly ignore violations to floodplain regulations;

- Reduce the overall risk of property damage (on both the violator's property and possibly adjacent properties) and loss of life due to flooding;

- Assure that a community will be compliant with NFIP participation requirements. Failure to take enforcement actions can lead to formal sanctions against the community by FEMA. The sanctions include placing a community on *probation* or *suspending* the community from the NFIP, and can affect both the price/availability of flood insurance and reduce or eliminate many forms of disaster assistance.

Authority to Enforce

Every community participating in the National Flood Insurance Program has the authority to take enforcement actions. The model regulations have a Violations and Penalties section that says:

Violation of the provisions of this ordinance or failure to comply with any of its requirements shall constitute a misdemeanor of the ___ degree. Any person who violates this ordinance or fails to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall upon conviction; thereof, be fined or imprisoned as provided by the laws of the community. Each day such a violation continues shall be considered a separate offense. Nothing herein contained shall prevent the community from taking such other lawful action as is necessary to prevent or remedy any violation. The community shall prosecute any violation of this ordinance in accordance with the penalties stated herein.

If a community's flood damage prevention regulations have been incorporated into a zoning code, there should be a similar section pertaining to violations.

Prerequisites of a Successful Enforcement Program

It is important to understand some basic issues regarding enforcement before taking an enforcement action. If your community has each of the following in place, the number of enforcement actions should be minimal and your success rate should increase.

Good code administration is the foundation for code enforcement. The number of potential enforcement actions can be minimized through good administration of your community's floodplain management program. Namely three activities can assist: educate your community about floodplain management regulations and the need for permits; inspect floodplain development after it has been permitted; and regularly tour your community's floodplain areas.

Educating a community about your floodplain management regulations can be accomplished many different ways. Try holding workshops or talks with groups that have involvement in land development and improvement such as a local contractors group, local board of Realtors, builders active in a community, septic system installers, consulting engineers and surveyors. Even writing each of the above mentioned groups,

on an annual basis couldn't hurt! Develop a brochure, fact sheet, and/or website explaining permit procedures and requirements. Try placing brochures or fact sheets in libraries, on community bulletin boards, or in home improvement/hardware stores. Have materials and a booth at a local festival or fair. To educate citizens, a press release once or twice per year (especially at the beginning of construction season) may be helpful.

Inspecting floodplain development after it has been permitted will minimize errors during its construction. Depending on the size of the development, it may need to be inspected more than once. For example, a residential home built on a properly vented enclosure below the lowest floor may need to be inspected to ensure that the flood vents have been installed properly and at the right elevation. After the enclosure has been completed, it may be necessary to inspect the lowest floor of the structure to ensure that it has been built at or above the base flood elevation.

Finally, regularly touring your community's floodplain areas is critical, especially if your community has extensive undeveloped floodplain areas. By noticing unpermitted development in the course of construction, it is often easier to remedy the issue than if the development was completed. Installation of manufactured homes or placement of accessory structures frequently happens in 24 hours or less!

Document, document, document! Having documentation of permits, conversations, inspections, etc. related to a development is important in administering any land use regulation – it is absolutely necessary when enforcing them! Try to have the mindset that every enforcement action might end up in court and as floodplain administrator, you will have to provide evidence of your actions.

Beware of Constitutional issues – due process and equal protection. Land use regulations affect the basic right of a person to use their property. As a community official responsible for enforcing such regulation, great care must be taken to ensure that people are treated fairly and equally. Otherwise, a local official may be violating Constitutional rights. The two most prevalent in land use cases involve due process and equal protection. The following is offered for informational purposes and does not constitute legal advice.

The Fourteenth Amendment to the United States Constitution states that no state "shall deprive any person of life, liberty, or property, without due process of law. Generally, due process means that fair procedures have to be applied to individuals, regardless of the outcome. For example, a code enforcement official cannot automatically have a fine levied against an individual violating floodplain regulations; rather, the code enforcement official must go through certain procedures of notifying the individual that he/she is in violation, and provide an opportunity for the individual to correct the problem.

The Equal Protection Clause is found in the Fourteenth Amendment. It requires that "no State shall deny to any person the equal protection of the laws." The focus of this clause is whether the government's regulation of property is reasonable and whether the regulations have been applied in a consistent manner.

To summarize, a community's administrative/enforcement processes must follow a fair procedure that gives due process to applicants/violators, and all processes must be applied consistently to all individuals.

Get to know your community's legal counsel. Some floodplain administrators may never have spoken to the community's legal counsel about a violation to the community's flood damage prevention regulations. If you, as floodplain administrator fall into this category, contact your community's legal counsel and arrange a meeting. The community's legal council will be an important player in most enforcement actions and will lead some of them (i.e., civil and criminal prosecution). Having an established process for supporting the enforcement actions will make both the floodplain administrator and the prosecutor's job easier.

As a government official, floodplain administrators are held to a high level of public scrutiny which makes communication skills important. In terms of dealing with difficult issues such as violations, a floodplain administrator can improve chances of success by:

1. Not having preconceived opinions about a particular alleged violation before investigating it. Sometimes, a violation may be reported by a neighbor or another person who has other issues with the alleged violator. Be careful of feuding neighbors!

2. Make an attempt to speak to a violator before sending a notice of violation or other written correspondence. This may allow you to solve simple problems before they become violations.

3. When talking to a violator, explain the violation, explain the intent of the regulation, and explain potential remedies to the violation. Violators may not like what you are saying but they are more likely to resolve an issue if the regulations are explained to them. Be empathetic but clearly convey that a remedy must occur. (Also remember to document any conversations!)

4. Be professional. When pursuing violations, you may run into hostile and difficult people. Maintain a sense of professionalism and do not get pulled into a "war of words." Stay focused on the requirements of the regulations and what must be done to reduce risk and protect the health and safety of those involved.

Types of Enforcement Actions

There are a variety of enforcement actions that can be taken. Each violation should be evaluated to determine the appropriate enforcement action. Remember, the ultimate goal of any enforcement action is to obtain compliance with the regulations, not to punish the violator. An overview of different types of enforcement actions commonly used to remedy violations follows. (For other methods and a more in-depth discussion of these methods please refer to the reference list at the end of this chapter.) All of these actions can be applied to most land-use code enforcement issues with the exception of the Section 1316 Flood Insurance Denial.

Administrative types of enforcement actions are usually initiated by the floodplain administrator in response to an actual violation (if the violation is alleged but has not been investigated, do not use these methods yet. These actions should be done in consultation with your community's legal advisor but generally are not initiated by the advisor. Examples of administrative actions are listed below.

1. *Informal meeting with violator.* When a violation is confirmed, the floodplain administrator should attempt to meet with or telephone the violator. During this event, the floodplain administrator should be prepared to discuss the observed violation (e.g. the violator did not apply for or obtain a floodplain development permit), the section of the code that has been violated, possible remedies to the violation, and why the violation occurred in the first place (this information is valuable as it may help identify ways to make people more aware of the regulations). Attempt to obtain a commitment from the violator to remedy the violation by a certain date, and follow-up to determine whether the violation has been remedied. Document the meeting, the proposed resolution and any follow-up actions required.

2. *Notice of Violation (NOV).* A NOV is a formal warning to the violator that the community is aware of the violation, and further action will be taken if the violation is not remedied. Generally, a NOV letter should contain the following information: the name of the property's owner; street address; the code sections violated; a description of the development or action which violates the applicable codes; a list of necessary corrections to bring the property into compliance; a deadline or specific date to correct the violations; and the potential consequences should the property remain in violation after the expiration of the compliance deadline including but not limited to civil and/or criminal prosecution, etc.

   Usually, a NOV will get a violator to contact your office and discuss the issue. NOV's should be sent by certified mail with return receipt requested. This will provide a record that the property owner was notified. It may be difficult to find the address of the property owner. One way to obtain that information is by finding the parcel using the county tax maps and reviewing the county auditor's

tax records. It is recommended that you work with your community's legal advisor to develop a NOV's.

3. *Office hearing.* An office hearing is a semi-formal meeting between the violator and the floodplain administrator, usually held in the floodplain administrator's office. The floodplain administrator may invite the community's legal counsel while the violator may invite an expert (i.e., surveyor, engineer) and/or attorney. Similar to the informal meeting described above, the floodplain administrator should be prepared to discuss the violations and develop a list of corrective actions needed to remedy the violation. As in the informal meeting, there is no requirement for the violator to attend and there is only a good faith commitment by the violator to remedy the violation. There is no guarantee of compliance.

4. *Mediation.* Mediation is a technique where a trained, neutral third party mediates a discussion between the violator and the floodplain administrator. The goal of the mediation is to have an objective discussion of the issue, thoroughly explore all potential options to correct the violation, and arrive at a written agreement signed by all parties involved (including the mediator). The written agreement should identify tasks to be completed by both parties, establish the remedy and a timetable for completion.

   Many Ohio counties have mediation services that can be used. Unlike arbitration, the mediator tries to facilitate an agreement. The mediator cannot make findings and render a binding decision. This action relies on voluntary cooperation and good faith of the violator to correct the violation. Local county mediation services can be found on the Ohio Commission on Dispute Resolution and Conflict Management website at http://www.state.oh.us/cdr.

5. *AVRP.* Communities participating in the National Flood Insurance Program have the responsibility to enforce flood damage prevention regulations. According the Code of Federal Regulations, violations to a community's floodplain management regulations must be remedied to the maximum extent practicable. ODNR Floodplain Management Program has crafted a model process that is a variation of mediation to remedy particularly difficult violations. The Alternative Violation Remedy Process, or AVRP can be used in limited situations such as when a violation is several years old and the chances of a successful judicial action is low. The AVRP can be downloaded from ODNR's website at: http://www.dnr.state.oh.us/water/floodpln/

Judicial enforcement actions must be taken when administrative enforcement actions fail to remedy a violation. Judicial actions are formal enforcement measures that involve the courts. These actions include criminal prosecution or civil actions and require involvement and leadership from the community's legal counsel. Regardless of which judicial enforcement action is used, it is strongly recommended that the floodplain

administrator and community's legal council develop a procedure and checklist for pursuing violators with these actions.

Authority for both criminal prosecution and civil actions is provided under the Violations and Penalties section of the ODNR Model Flood Damage Prevention Regulations. *Criminal prosecution* of a violation of flood damage prevention regulations can result in a fine, imprisonment or both. *Civil actions* usually result in injunctions being issued against the violator that either require or prevent the violator from doing something.

The burden of proof is greater in criminal prosecution than in civil actions and rests with the local government. It often takes much less time to get a court order with criminal prosecution. Civil actions can easily take at least one year or more to obtain a permanent injunction. Sometimes, criminal prosecution is the last resort after administrative actions and civil actions have been tried unsuccessfully. The stigma of a criminal prosecution may compel a violator to comply with local regulations.

Which type of judicial action is right for a particular situation? It depends. Generally, the community's legal counsel will determine the appropriate action based on the nature of the violation. Counsel may consider the likelihood of success in winning the case, whether enough proof of the violation exists vs. the burden of proof required, the local court's attitude toward code enforcement cases, and other factors.

Section 1316 Flood Insurance Denial is a unique and effective tool for communities pursuing structural violations of locally adopted floodplain management regulations and is unique to the NFIP. Under Section 1316, found at Part 73 of the NFIP Regulations, the Federal Insurance Administration, an arm of the FEMA, can deny flood insurance coverage on a structure built in violation. Some property owners may not initially see this as a problem, since the owner would not be able to obtain or pay premiums on an NFIP flood insurance policy. However, denial of flood insurance under Section 1316 would have serious ramifications for a property owner. Flood insurance coverage would not be available under the NFIP and federally backed loans for purchase, refinancing, damage repair or improvement of buildings in identified Special Flood Hazard Areas would not be available. Federal and state flood disaster assistance would be severely limited with only emergency-based temporary housing and other immediate necessities available after a flood.

In order for communities to request a Section 1316 denial of flood insurance from FEMA, a community must follow certain procedures and document the community has attempted to remedy the violation to the maximum extent practicable. The community must pursue full legal and administrative remedies. Section 73.3(d) of the NFIP Regulations states:

A request for denial must be supported by:

1. The name(s) of the property owners and address or legal description of the property sufficient to confirm its identity and location;

2. A clear and unequivocal declaration that the property is in violation of a cited state or local law, regulation, or ordinance;

3. A clear statement that the public body making the declaration has authority to do so and a citation to that authority;

4. Evidence that the property owner has been provided notice of the violation and the prospective denial of insurance; and

5. A clear statement that the declaration is being submitted pursuant to section 1316 of the National Flood Insurance Act of 1968, as amended.

A Section 1316 action should be considered as a last resort, to impose a prohibition of flood insurance on a structure that has not been brought into compliance with the NFIP minimum flood protection standards despite the best administrative, enforcement, and legal actions taken by a community. Obtaining a Section 1316 declaration on a violation is one method a community can demonstrate to FEMA that a structural violation has been remedied to the maximum extent practicable.

An Example Enforcement Process

The following article was submitted by a Kent Huston, P.E, City Engineer for the City of Lancaster and floodplain administrator as an example of how a community carried an enforcement action to the maximum legal extent practicable printed in ***The Antediluvian*** during the summer of 1999.

In many smaller communities, local floodplain management is the responsibility of a local agency or department that wears many different hats in the course of daily duties. For the City of Lancaster, a community of approximately 37,000, the administration of the City's Flood Damage Prevention Ordinance was assigned to the Engineering Department in May of 1980. This made sense at the time because the Engineering Department, in addition to management of public infrastructure projects, had staff that administered the zoning codes, subdivision codes, residential building codes, and sign regulations. In addition, the department issued the permits that were required by these and other codes. Today the department still has these duties. In some respects, this is an advantage for the administration of the Flood Damage Prevention Ordinance. If there is any project being proposed in the City it must begin in the Engineering Department and if there are issues involving the floodplain, those issues can be addressed in a single review. The disadvantage to the administration of so many regulations is that there is no expert in some areas. The department relies heavily on the ODNR Division of Water for guidance when an unusual situation develops in floodplain management.

One of those unusual situations, how it was resolved, and what safeguards the City took to minimize the risk of a similar violation from occurring is the story to be told. In 1993, a local builder applied for building permits to construct two duplex units on property he and his spouse owned. Since the property was in

the flood fringe of the Hocking River, a Development Permit for construction in a flood hazard area was required. The units were constructed. In June 1996, the City was notified by FEMA that both buildings were in violation of the City regulations and were built 3.3 feet below the Base Flood Elevation (BFE). Since the building permits were issued by and the inspections during construction were performed by the Engineering Department, it was first assumed that there had to be some mistake with the elevation information in the FEMA letter. The Development Permits for the buildings were checked. The BFE on those permits was checked, was correct, and the builder had signed those permits acknowledging he knew the required low(est) floor elevation. A visit to the site revealed that both structures were visibly constructed at an elevation higher than adjacent structures. Since the property was in an older section of the City that was fully developed many years before any floodplain regulations existed, there were no convenient bench marks for reference. Record street and sewer drawings were reviewed that showed enough elevation information to convince staff that the structures were in fact built below the BFE.

A Violation Notice was mailed to the owner in July 1996. Following the notice, there were several meetings between the City and the owner's attorney and a formal response from the owner's attorney was received in March 1997. In summary, the owner's response was that it was too costly to raise the structures and do the other work needed to bring the buildings into compliance. The owner's attorney attempted to make an argument, based on the FEMA manual Retrofitting Flood-prone Residential Structures, that the City should base its decision on what corrective work needed to be performed on cost-benefit considerations. Since this was our first violation of this nature, we provided detailed information to ODNR and requested their review of the owner's argument and their technical assistance. As pointed out at the time by ODNR staff, the manual in general applies to structures built prior to floodplain regulations and not to structures built in violation of regulations. There were more discussions between the City and the owner's attorney through 1997. Attempts to resolve the problem in early 1998 also failed and nothing constructive appeared to be happening. The City learned that the owner had not continued the services of the attorney that we had been working with. The City filed with the Municipal Court in June 1998. There were hearings and delays and another round of discussions with the new attorney. The case went before a judge in January 1999. Charges against the owner's spouse were dismissed. The owner pled guilty and the judge delayed sentencing until June 1999.

Apparently the owner and his attorney believed that a variance could be obtained and they filed a request with the Board of Zoning appeals. Both the City Law Director and Engineering Department recommended denial. ODNR staff provided general guidance on requirements for variances to floodplain regulations. The Board of Zoning Appeals denied the request in January 1999.

The owner and his attorney were made aware that if the buildings were not brought into compliance the City intended to request that FEMA deny the availability of flood insurance coverage to the structures pursuant to the provisions of Section 1316 of the National Flood Insurance Act. That request and backup documentation was forwarded to FEMA Region V in March 1999. The review of the denial request was substantially completed by FEMA in June 1999 and will be finalized as soon as we can make a site investigation and confirm in writing that the violations on the buildings have not been corrected.

To help minimize the risk of this problem in the future, we have added the requirement in our regulations that an on-site construction bench mark be established before construction begins and the location and elevation be included with the Development Permit. This elevation is needed for the contractor to build the structures and will allow department staff to field check the building elevation if it appears justified.

The City has never had to take an owner to court to enforce the floodplain regulations. First, the action itself will not protect the occupants nor contents of the buildings. Second, the owners of the buildings will not be able to mortgage or sell their property through conventional financial institutions. Third, a significant decrease in the buildings' value is probable. Fourth, the City and owner have substantial resources invested in an action that really is not a solution. Having to take this action should be **The Last Resort.**

The Floodplain Management Program can assist floodplain administrators with developing an enforcement process.

6.6 MAP MAINTENANCE AND PERIODIC NFIP PARTICIPATION DUTIES

Community Flood Map Maintenance

Communities participating in the NFIP should be aware of changes that may affect their flood maps and, in some instances, are required to submit information regarding those changes to FEMA. Below is a brief list of actions that require notice to FEMA.

Submitting new technical data that affects flood maps. Federal NFIP regulations at 44CFR 65.3 and 4 require that communities submit technical data in certain circumstances. These requirements are also contained in the ODNR model regulations. Basically, when a community has a development proposal that affects base flood elevations or floodway delineations, technical data reflecting the changes (e.g. hydrologic and hydraulic studies) must be submitted to FEMA within six months of when that information becomes available. An example of this is a development that changes the floodway boundary. The hydrologic and hydraulic analysis submitted to your community shows the revised boundaries and support a map change. FEMA requires the community to maintain current and accurate flood hazard information.

Communities also have the right, at any time, to submit new technical data that pertains to the maps but does not impact floodplain or floodway delineations. Such changes might include creation of roads, new subdivisions, annexations outside of flood hazard areas, or other similar details. Map change information should be submitted to the FEMA V Regional Office. FEMA Region V is located at 536 South Clark Street, 6th Floor, Chicago, IL 60605.

Submitting annexation information. Most older FIRMs show only the area within the community limits. Newer FIRMs are countywide, showing both incorporated and unincorporated areas. When municipal boundaries (cities, villages) change due to annexation the community must advise FEMA. It is best to send a copy of the annexation ordinance and attach a map with the revised boundaries to the FEMA V Regional Office.

Biennial Report

All communities participating in the NFIP have agreed to submit a report to FEMA. Every two years, FEMA sends out a report form that must be completed and returned within 30 days (it now can also be completed through the Internet). The report documents information about changes to the community's flood hazard areas and corporate boundaries. If there have been changes, copies of the new data or maps must be submitted with the report so the flood insurance map can be revised. Information about permits and variances granted in the floodplain is requested. floodplain administrators with accurate and up-to-date permit files will find the report form easy to complete.

Community Assistance Visits (CAVs) and Community Assistance Contacts (CACs)

The CAV is a scheduled visit to a community participating in the NFIP for the purpose of: 1) Conducting a comprehensive assessment of the community's floodplain management program; 2) assisting the community in understanding the NFIP requirements; and 3) assisting the community in correcting deficiencies or violations.

The CAV process consists of five steps: 1) scheduling the visit with the community's chief elected officer and the floodplain administrator; 2) site review of development within the community's Special Flood Hazard Area; 3) meeting with community officials; 4) preparation of a Community Visit Report and a summary letter to the community's chief elected officer within 30 days of the meeting (details the community actions necessary to resolve any identified compliance problems); 5) and closure of all issues identified in the Community Visit Report. Closure may involve referral to FEMA for compliance actions if deficiencies and violations are not resolved.

Topics discussed during the CAV meeting include: 1) the community's floodplain regulations and whether there are any deficiencies or opportunities for improvement; 2) the community's permit process for development review procedure; and 3) review of floodplain development permits that have been issued by the community (with an emphasis on those developments observed during the field tour prior to the CAV meeting to identify compliant and noncompliant development). Floodplain administrators can prepare for the CAV meeting by reviewing the community's floodplain regulations. Note any areas that are unclear or may need updating. Review copies of administrative forms (permit applications, elevation certificates, etc.) and outline the community's permitting process. Be prepared to explain how the community procedures provide for enforcement of the floodplain management regulations. Provide floodplain development permit files for review that demonstrate your community's ability to meet NFIP requirements. (Do you regulate new and existing development, structural and nonstructural actions? Have you performed post-flood damage and permit activities?) Be prepared to address follow-up issues from the CAV. Unresolved issues can lead to FEMA sanctions and unnecessary problems for your community.

A Community Assistance Contact (CAC) is similar to a CAV but much less intensive. It is essentially a telephone interview with the floodplain administrator to assess the community's floodplain management program. Neither a field tour nor an on-site meeting are conducted during a CAC. This approach is often used during or following large flood disasters when the state and federal agency staff do not have the time to travel to each community that may need technical assistance. The CAC is also used frequently to maintain contact and awareness in communities with well-developed local floodplain management programs.

CHAPTER 7: OTHER RELATED TOPICS

7.1 FLOOD INSURANCE BASICS

As an incentive for communities to adopt and administer floodplain management regulations (to reduce future flood risk for new construction in SFHAs), the federal government makes flood insurance available within the community. The regulations are intended to improve health, safety, and sustainability by reducing future risk for new and improved development. The regulations apply to identified areas of flood risk. To participate in the NFIP, communities agree to adopt and administer floodplain management regulations that contain performance standards that are successful in reducing flood damage. Community participation in the NFIP is voluntary and enables property owners (within the community) to purchase flood insurance to help reduce the economic impact of flooding.

NFIP coverage is available to owners of insurable property (a building and/or its contents) in a community participating in the NFIP – regardless of whether the structure is in a floodplain or not. Renters may also insure their personal property against flood loss. Almost every type of walled and roofed building, that is principally above ground and not entirely over water may be insured if it is in a participating community. In most cases, this includes manufactured (i.e., mobile) homes that are anchored to permanent foundations and are regulated under the community's floodplain management regulations.

The two basic objectives of the regulations are to ensure that development will not worsen existing flooding conditions, and to protect the development from flood damage. A community may participate in the Emergency (or initial) Phase of the NFIP. A limited amount of insurance is available to residents at a subsidized rate. A community may also progress to or participate in the Regular Phase of the NFIP. Additional amounts of flood insurance are available in this phase. The premiums for the Regular Phase insurance reflect the actual risk of flooding, or actuarial rates. Any structure that existed prior to the community's entry into the Regular Phase qualifies for either the subsidized rate or the actuarial rate, whichever is lower. (Insurance rates for all buildings in the Regular Phase are based on a two-tiered rating method using BASIC LIMITS and ADDITIONAL LIMITS). BASIC LIMITS coverage (up to $50,000) is assigned a higher rate while coverage under ADDITIONAL LIMITS ($50,001-$250,000) can be purchased at a lower rate. Flood Insurance rates are outlined in the federal Flood Insurance Manual.

	Emergency Program	Regular Program
Building Coverage		
Single-family dwelling	$35,000	$250,000
Other residential	$100,000	$250,000
Non-residential/Small Business	$100,000	$500,000
Contents Coverage		
Residential	$10,000	$100,000
Non-residential/Small Business	$100,000	$500,000

Flood Insurance vs. Disaster Assistance

Federal flood insurance is designed to provide an alternative to disaster assistance and disaster loans. Disaster assistance is not intended to cover all the costs of repairing homes and businesses. It is especially important to remember that disaster assistance is available only after the floods that are declared major disasters by the President of the United States. Many floods damage hundreds of properties throughout Ohio, but they do not result in Federal or Presidential disaster declarations. Limited state disaster assistance may be available, but certainly not enough to recoup all losses.

Disaster loans may be made available in Presidential or Federal declarations or by the Small Business Administration. Loans require repayment, typically over a 10-year period. Flood insurance will provide payment whenever damage from a qualifying flood event occurs.

Insured Losses

The "Standard Flood Insurance Policy" covers direct loss to structures (contents coverage is also available to both owners and renters) 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 areas from overflow of inland or tidal waters or from the unusual and rapid accumulation or runoff of surface waters from any source." Flood insurance will not cover damages caused by high ground water, sewer backup, or subsurface flows unless the property has been, at the same time, damaged by surface floodwater.

Insured Property

Any walled and roofed building in an NFIP participating community can be insured. A manufactured (mobile) 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 walls, floors, insulation, furnace and items permanently attached to structure.
2. Contents coverage that must be purchased separately from structural coverage.

Flood insurance does not cover property outside an insurable building, vehicles, trailers on wheels, boats, animals, crops in the field, money, valuable papers, fences, outdoor swimming pools, bridges, driveways, bulkheads, docks, land values, plants, landscaping and finished portions of a basement (as described below).

Contents Coverage

Homeowners and renters may purchase flood insurance coverage for the contents of their structure(s). Contents coverage is not automatically provided under a flood insurance policy (except under the Preferred Risk Policy). If contents coverage is desired, a specific amount must be named and a separate premium will be charged, however it does not need to be a separate policy. The maximum coverage available for contents is $100,000 for residential policies and $500,000 for commercial policies.

Basement Coverage

The standard flood insurance policy provides coverage against damages caused by surface flooding only. It does not cover damages from seepage or sewer backup unless the above ground portion of the building was also flooded simultaneously. The policy offers limited coverage of basements. A basement is defined as any area of a building that is below grade on all sides, including the lower level of split or bi-level homes. The policy does not cover finished portions of a basement such as carpeting, paneling or furnishings. Unimproved structural parts such as the foundation, walls, stairway and utility connections are covered. It also covers unimproved (not taped or painted) drywall and insulation, sump pumps, water tanks, furnaces, water heaters, heat pumps, electric junction and circuit breaker boxes, washers and dryers, food freezers, air conditioners and cleanup.

Private carriers may have coverage available for sewer backup or sump pump failure. Details on the coverage and cost should be obtained directly from the company offering the coverage.

Mandatory Purchase

The Flood Disaster Protection Act of 1973 as amended, mandates the purchase of flood insurance of federal or federally related financial assistance for acquisition/construction of buildings in 100-year flood hazard areas is obtained. The purchase of flood insurance for structures outside the 100-year flood hazard area is voluntary. A lending institution is not required by statute to make the borrower purchase flood insurance for more than the amount of the loan or for more than twice the amount of insurance available under the Emergency Program ($35,000 X 2 = $70,000), whichever is less. However, lending institutions may require a borrower to purchase flood insurance in a greater amount than required by statute and for buildings outside the 100-year flood hazard area as part of their lending policy.

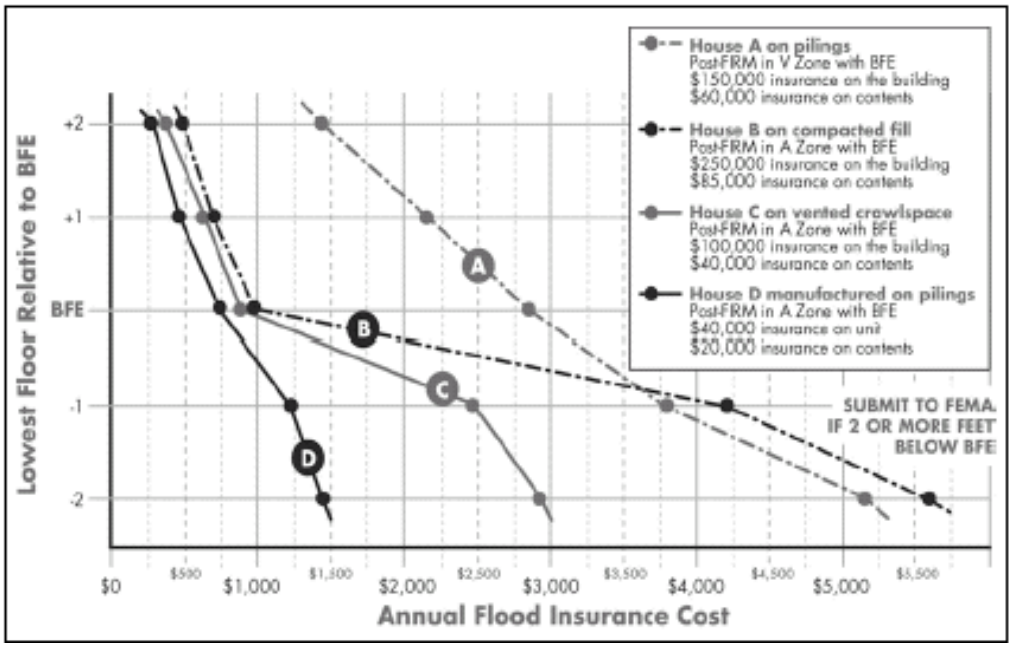
NFIP coverage is available to all owners and occupants of insurable property (building and/or its contents) in a community participating in the NFIP. A policy may be purchased from any licensed property insurance agent or broker who is in good standing in the state in which the agent is licensed. Write Your Own (WYO) companies are private-sector insurance companies who have agreed to sell and service flood insurance under their own names. An agent representing a WYO company is another source for flood insurance.

Rating

There are several different rates for flood insurance; however, these rates are consistent for the same kind of structure nationwide. Flood insurance rates in A-Zones are higher than in B, C, or X zones. This is because A-Zones are the higher hazard floodplain areas while B, C, or X zones are lower hazard. Within A-Zone areas, rating is affected by a structure's date of construction (e.g. pre-FIRM and post-FIRM). For an explanation on the difference between pre- and post-FIRM, review Section 5.6. Because pre-FIRM structures were generally built before community flood regulations were adopted, they may be more prone to flooding. It is expected that post-FIRM structures were built in compliance with local floodplain regulations, and will be less susceptible to flood damage. Based on these concepts, pre-FIRM flood insurance rates are subsidized while post-FIRM rates are "actuarial" or based on the actual risk to flooding. If the cost of insuring the high-risk pre-FIRM flood insurance structures were not subsidized, the federal government determined flood insurance would not be affordable those who most need it.

Elevation relative to the Base Flood Elevation is the most significant factor that influences the rate used to price federal flood insurance. The flood zone and the total value of the building also affect the total cost for flood insurance. Because permit decisions influence elevation, it is important that floodplain administrators understand how the cost of insurance can be significantly affected by elevation.

Examine this graph to see how the annual cost of a flood insurance policy varies with elevation. Four generic types of buildings are represented (note – these figures are for comparison purposes only, actual costs will depend on many factors and the rates that are in effect when the policy is written). While builders often complain about the additional costs to build one or two feet above the minimum BFE, owners should consider the annual savings associated with building higher. For example, using example B, the owner of a $250,000 house in the A Zone will pay about $1,000 per year if property built to



the BFE. If the owner builds just 2 feet higher, the annual premium will be about $500. That's a savings of 50% or $500 every year!

Appendix D includes fact sheets on flood insurance that may be used to support your local floodplain management program.

7.2 MITIGATION

Mitigation is defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. The National Flood Insurance Program (NFIP) is the local floodplain administrators daily flood mitigation program. For example, NFIP participating communities adopt and enforce floodplain management regulations designed to reduce flood damage to new and substantially improved structures. Enforcing local floodplain management regulations reduces the risk of flooding for the structure and the people who use it.

Since January 1, 1964, federally declared flood disasters in Ohio have cost more than $500 million in federal and state disaster assistance (in 2002 dollars). This total excludes insured and unreported / unreimbursed losses, and three of the largest floods in the history of the state. All levels of government and the private sector must continue to work together to reverse the trend of escalating flood damage.

Flood mitigation efforts have traditionally focused on large structural projects such as dams, levees etc. Conversely, the national trend has concentrated on non-structural approaches in recent years, such as the acquisition, elevation, floodproofing, and retrofitting of individual structures. The list of possible mitigation activities is endless and ranges from simple to complex. A few examples of non-structural mitigation include:

- Guiding development away from high-risk areas through planning and zoning.
- Adopting flood damage reduction standards that exceed NFIP minimum standards.
- Purchasing flood insurance for flood-prone structures and contents.
- Developing a post-disaster flood response plan.
- Educating citizens about flooding in your community.

Every community should evaluate their flood risk tolerance and incorporate the appropriate mitigation strategies into their day-to-day business. FEMA has produced a series of mitigation planning guides referred to as the *State and Local Mitigation Planning How-to Guidance*. Copies of the guides can be downloaded from the FEMA website, or by calling 1-800-480-2520.

The Disaster Mitigation Act of 2000 (DMA2K) requires communities to develop natural hazard mitigation plans to be eligible for certain mitigation grant money for Presidential disasters declared after November 1, 2004. A natural hazard mitigation plan is a legally adopted document that analyzes a community's vulnerability and prescribes actions to reduce risk. Only communities with FEMA-approved natural hazard mitigation plans are eligible to receive Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA) funding. The Ohio Emergency Management Agency (OEMA) administers these mitigation grants. These grants fund most types of non-structural flood mitigation.

Communities should be aware of some commonalities in all of the mitigation grant programs. There is a 75 percent federal and 25 percent non-federal cost-share for these grants. The grant programs do not fund large structural flood control projects such as dams, levees, floodwalls etc. Projects must meet benefit-cost, environmental, and other federal, state, and local criteria. All applicants must be participating, and in good standing, in the National Flood Insurance Program if FEMA has mapped flood hazard areas in your community. You can check your community's NFIP status by visiting the Floodplain Management Program's website.

Hazard Mitigation Grant Program

The HMGP was authorized in November of 1988 under §404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 USC 5121, to provide grants implementation for long-term hazard mitigation measures. HMGP funding is only available following a Presidential declared disaster event. The amount of money available to communities is a percentage of the total federal disaster cost (excluding any associated administrative costs). The HMGP is designed to reduce the loss of life and property due to natural disasters and to enable the implementation of mitigation measures during the disaster recovery period. Communities must have a FEMA-approved natural hazard mitigation plan to receive HMGP funding for any disaster declared after November 1, 2004. Examples of projects eligible for HMGP funding include the acquisition, relocation, demolition or retrofitting of flood-prone structures.

Pre-Disaster Mitigation Program

The PDM was authorized by §203 of the Stafford Act, 42 USC 5121, as amended. The PDM program was developed to provide funds to states and communities for pre-disaster multi-hazard mitigation planning and the implementation of cost-effective mitigation projects prior to a disaster event. Congress allocates funding for PDM yearly from the National Pre-Disaster Mitigation Fund. Examples of eligible flood related PDM projects include the elevation, acquisition, or relocation of flood-prone structures and minor flood control projects designed to protect critical facilities. Communities can apply for PDM funding to develop mitigation plans that comply with the requirements of 44 CFR Part 201.

Communities that submit applications will be competing nationwide for PDM funding. These applications will be ranked by FEMA according to ten factors. The applications then move to a National Evaluation panel that will score the applications based on additional pre-determined qualitative factors. FEMA will consider the National Evaluation Score during the grant award selection process.

Competitive applications must have a Benefit Cost Analysis with supporting documentation that demonstrates a benefit-cost ratio greater than 1.0. The application should clearly document the proposed projects engineering feasibility, impact on the environment, and any historic preservation issues. Communities with questions about the technical aspects of developing a PDM application can contact FEMA's Technical Assistance Helpline at 1-866-222-3580.

Flood Mitigation Assistance

The FMA program was created as part of the National Flood Insurance Reform Act of 1994, 42 USC 4101. The FMA program is funded annually through the National Flood Insurance Fund. The goal of the FMA program is to reduce or eliminate insurance claims under the NFIP. FMA provides funding to communities for measures that reduce or eliminate the long-term risk of flood damage to structures insurable under the NFIP. The FMA program also funds local natural hazard mitigation planning efforts. The State of Ohio is required to prioritize FMA project grant applications that include repetitive loss properties (structures having one or more flood insurance claim). Examples of eligible FMA projects include: the elevation, acquisition, and relocation of NFIP-insured structures.

7.3 THE COMMUNITY RATING SYSTEM

The NFIP's Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. As an incentive, the communities that participate will receive premium discounts for any flood insurance policies sold within their community. The discounts are associated with a "class" rating and result in 5-45% discounts.

Background

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

Purpose and Scope

When your community participates in the CRS, everyone benefits, including those who don't live or own property in a floodplain. Even when there is no flooding, your community's public information and floodplain management efforts can improve the quality of life, protect the environment, make people safer, and save everyone money.

If there is a flood, your CRS activities:

- Save lives.
- Prevent property damage.
- Avoid lost jobs and economic devastation caused by flooding of offices, factories, farms, stores, and other businesses.
- Prevent damage and disruption to roads, schools, public buildings, and other facilities.

Objective

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

- Protect public health and safety,
- Reduce damage to buildings and contents,
- Prevent increases in flood damage from new construction,
- Reduce the risk of erosion damage, and
- Protect natural and beneficial floodplain functions.
- Facilitate accurate insurance rating, and
- Promote the awareness of flood insurance.

Rating System

To be recognized in the insurance rating system, community floodplain management activities must be described, measured, and evaluated. The basic tool for this is the *CRS Schedule*, which sets forth the application procedures, creditable activities, and the

credit points assigned to each activity. A community receives a CRS classification based upon the total score for its activities. The CRS *Commentary* explains the *Schedule* and gives examples of activities and how their credit is calculated. The *Schedule* and *Commentary* are included within the CRS Coordinator's Manual, the primary document detailing the program. The *Schedule* identifies 18 creditable activities, organized under four categories (labeled Activities 300 through 600): Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. The *Schedule* assigns credit points based upon the extent to which an activity advances the goals of the CRS. Communities are invited to propose alternative approaches to these activities in their applications.

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

CRS CLASSES BY POINTS EARNED AND PREMIUM REDUCTIONS ACHIEVED

Class	Credit Points	Premium Reduction	
		SFHA*	**Non-SFHA****
1	4,500+	45%	5%
2	4,000 – 4,499	40%	5%
3	3,500 – 3,999	35%	5%
4	3,000 – 3,499	30%	5%
5	2,500 – 2,999	25%	5%
6	2,000 – 2,499	20%	5%
7	1,500 – 1,999	15%	5%
8	1,000 – 1,499	10%	5%
9	500 – 999	5%	5%
10	0 – 499	0	0

*Special Flood Hazard Area

**Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage. The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies. Although they are in SFHAs, Zones AR and A99 are limited to a 5% discount. Premium reductions are subject to change.

Community participation in the CRS is voluntary. Any community in full compliance with the rules and regulations of the NFIP may apply for a CRS classification better than Class 10. The community submits the *CRS Application* and documentation that shows the activities for which credit is requested. All CRS credit is verified according to the detailed discussion of the activities in the *Coordinator's Manual*. The application process is discussed in more detail in the *CRS Application*. To initiate process, a community should forward their completed *CRS Application* and necessary documentation to the appropriate ISO/CRS Specialist.

Ohio communities should forward CRS applications to:

Tom Brett
1327 Old Meadow Road
Pittsburgh, PA 15241
412-221-4679
tbrett@iso.com

Copies of all or parts of the application may be sent to the Regional Office of the Federal Emergency Management Agency (FEMA) and to the State NFIP Coordinator.

The Insurance Services Office, Inc. (ISO) assists FEMA in the operation of CRS and community verification activities. Among other services, ISO develops and provides advisory fire insurance classifications for community fire protection programs. ISO reviews CRS applications, verifies the communities' credit points, and performs program improvement tasks.

The community's activities and performance are reviewed during a verification visit. FEMA sets the credit to be granted and notifies the community, the State NFIP Coordinator, insurance companies, and other appropriate parties. The classification is effective on either May 1 or October 1, (whichever comes first) after the community's application is verified. Each year the community must recertify or reverify that it is continuing to perform the activities that are being credited by the CRS. Recertification is an annual activity that includes progress reports for certain activities. The more extensive verification takes place every few years and is conducted in the form of a visit to the community similar to the initial verification visit. If a community is not properly or fully implementing the credited activities, credit points and possibly its CRS classification, will be revised. A community may expand activities each year to improve its CRS classification and gain more credit points.

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

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

Costs and Benefits

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

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

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

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

  2. A community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.

  3. Technical assistance in designing and implementing some activities is available at no charge.

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

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

For more information regarding CRS, you can visit the CRS Resource Center at http://training.fema.gov/EMIWeb/CRS/. [18]

7.4 INTERAGENCY COORDINATION

Although nearly all authority for regulation of development in the SFHA is subject to local regulations, there are a few situations that either are regulated at the state level or have some form of concurrent review. Agencies such as the Ohio Department of Health (ODH) and the Ohio Environmental Protection Agency (OEPA) have the authority to preempt local regulation of some specific development actions described below.

Manufactured Home Parks
Ohio Department of Health (ODH) has authority to review and regulate the installation and removal of manufactured homes within a licensed manufactured home park to ensure that the proposed development will be adequately floodprotected within the 100-year floodplain. The Ohio Administrative Code, Section 3701-27-07(B) requires that all

[18] Excerpted and adapted from http://training.fema.gov/EMIWeb/CRS/.

new, expanded or substantially altered manufactured home park sites not be subject to recurring flooding. Because of the nature of the manufactured home's usual blocking foundation, it is essential that the home and its foundation system be located above the base flood elevation (100-year flood elevation), so that the home is protected from possible foundation shifting during a flood event. ODH has established a "Flood Protection Elevation" in which the strips, piers or pad supporting homes in manufactured home parks should be located above the base flood elevation for the particular area proposed.

Applicants for manufactured home park approval are referred to ODNR of the local floodplain administrator for available flood hazard information (e.g. Flood Insurance Rate Map and Flood Insurance Study). For sites where flood information is available, ODNR will provide the 100-year floodplain elevation, the flood protection elevation, and delineated floodway limits. If floodplain information is not available, ODNR will notify the applicant and ODH. It is the responsibility of the person requesting a permit for development to provide the needed hydrologic/hydraulic data to ODNR for review. The ultimate decision on the need for additional information is the responsibility of ODH.

The installation and removal of manufactured homes outside a licensed manufactured home park must be regulated by the local jurisdiction (floodplain administrator). *(NOTE: Other development within a licensed manufactured home park, beyond the installation and removal of manufactured homes, must be evaluated for compliance by the floodplain administrator with community flood damage reduction regulations.)*

Water Pollution Control Loan Fund Projects

When considering improvements/additions to existing wastewater treatment plants (WWTP) or new facility construction, communities may apply for a low-interest loan through the Ohio Environmental Protection Agency's (OEPA) Division of Environmental and Financial Assistance (DEFA) Water Pollution Control Loan Fund (WPCLF). This program provides long-term and short-term loans for the planning, design, and construction of WWTPs as well as other water pollution control projects.

OEPA, in coordination with ODNR's Floodplain Management Program, reviews proposed WPCLF projects to determine proximity to the 100-year floodplain, potential adverse impacts to the environment, the floodway of the 100-year floodplain, the structural and mechanical integrity of the new facilities, as well as the overall capital investment. This assessment is conducted to ensure that new and existing facilities are protected from flood damage and the proposed development does not encroach upon the floodway and increase flooding.

Under Section 1521 of the Ohio Revised Code (ORC), development in 100-year floodplains that is funded by state and state-administered federal monies must comply with the minimum National Flood Insurance Program (NFIP) criteria. Public works projects such as these are also considered "development" under the NFIP and must be reviewed by the community for compliance with flood damage reduction regulations.

This means that the WPCLF project must be floodprotected to or above the 100-year flood elevation. If a community has adopted standards that exceed the minimum federal NFIP criteria, the proposed development must comply with those standards before development can commence.

Under the minimum NFIP criteria, in areas where FEMA has provided base flood elevation data, flood heights resulting from the base flood discharge may increase by up to one foot as a result of development in the floodplain throughout the community. To account for this allowable increase in flood heights, as well as the effects of wave action, channel obstructions, uncertainties in the hydrologic and hydraulic models, etc. ODNR recommends that a freeboard factor of 1.5-2 feet be added to the 100-year flood elevation. OEPA policy mandates that any expansion or addition of an existing wastewater treatment facility must incorporate this level of freeboard. In situations where adding 1.5-2 feet of freeboard is not feasible due to cost, site, or structural constraints, a lesser degree of freeboard may be integrated into the design as approved by OEPA. Floodway encroachments shall be avoided, if possible.

New wastewater treatment facilities must also be constructed with a freeboard factor of 1.5-2 feet and shall not encroach into the regulatory floodway. During review of the project, ODNR will reference the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) to ascertain the boundaries of the 100-year floodplain and regulatory floodway and identify the 100-year flood elevation. If identified flood hazard areas do not include 100-year flood elevation or floodway data, the community must provide a hydrologic and hydraulic analysis establishing the 100-year flood elevation and floodway to support ODNR review and determination.

OEPA and ODNR strongly advocate addressing flood protection requirements for proposed WPCLF projects during pre-planning meetings with communities. Incorporating these standards during the actual design of the project should reduce time and costs associated with the development. For questions regarding OEPA's WPCLF, contact DEFA at 614-644-2798. Inquiries regarding floodplain management requirements for such projects can be addressed by contacting ODNR at 614-265-6750.

7.5 PROFESSIONAL MEMBERSHIPS

Involvement in professional organizations is an excellent way to expand your expertise, network with other floodplain administrators and keep aware of what's new in your field. The following organizations are dedicated to promoting interest and sound floodplain management:

Ohio Floodplain Management Association (OFMA) is an organization dedicated to promoting interest in floodplain management throughout the state of Ohio. The organization works to enhance cooperation between public and private interests, local, state and federal agencies and encourages and supports legislation related to effective floodplain

management. OFMA prioritizes community education outreach programs and assists in the annual coordination of Ohio's only floodplain management conference. OFMA encourages professional growth in floodplain management by promoting effective, new, and innovative approaches to managing Ohio's floodplain systems.

OFMA is a division of the Water Management Association of Ohio (WMAO) and a chapter of the Association of State Floodplain Managers. For more information regarding OFMA, you may call (614) 882-5489 or visit www.ofma.org.

The **Association of State Floodplain Managers (ASFPM)** began in 1977 as the supporting organization of professionals involved in floodplain management, flood hazard mitigation, flood preparedness, and flood warning and recovery. It is the mission of the Association to mitigate the losses, cost and human suffering caused by flooding; and to promote wise use of the natural and beneficial functions of floodplains. Over 6,500 national and chapter members represent local, state and federal government agencies, citizen groups, private consulting firms, academia, the insurance industry, and lenders. The ASFPM also administers the Certified Floodplain Manager (CFM) Program, a national benchmark for competency in the floodplain management profession.[19]

For more information about the ASFPM, you may visit the organization's website at www.floods.org.

7.6 TRAINING AND CERTIFICATION

Emergency Management Institute (EMI)

The Emergency Management Institute (EMI) is a FEMA supported training center that focuses on the four phases of emergency management: mitigation, preparedness, response, and recovery. Courses address natural hazards (floods, earthquakes, hurricanes, man-made hazards (terrorism, hazardous materials, radiological emergency preparedness), and professional development. EMI develops and delivers emergency management training to enhance the capabilities of federal, state, and local government personnel as well as volunteers and members of the private sector.

EMI offers on-campus and home-study courses. There are no tuition fees for EMI on-campus courses. All instruction, course materials, and housing (for most participants) are provided at no cost. Participants from other countries, other federal agencies, and most participants from private industry or contractors to state, local, or tribal governments must pay their own transportation and lodging fees. All participants are responsible for the cost of cafeteria meals provided and for personal, incidental expenses.

[19] Excerpted and adapted from www.floods.org .

All EMI training is developed in partnership with state and local emergency management agencies. EMI is located on the National Emergency Training Center (NETC) campus in Emmitsburg, Maryland, just 75 miles north of Washington, D.C. [20]

You can obtain more information about attending training at EMI at http://www.training.fema.gov/emiweb/

Ohio Department of Natural Resources Workshops and Conferences

ODNR's Floodplain Management Program offers various training opportunities for community officials and professionals working with floodplain management:

- **Flood Loss Reduction Workshop**
  Workshop is designed to build basic floodplain management capabilities through application of NFIP regulations, Flood Insurance Studies, and maps. Training provides an introduction to the responsibilities of the local floodplain administrator and stresses the use of development review and permit process to successfully administer a local floodplain management program. Attendees will work through an exercise involving the entire floodplain development permitting process.

- **Floodplain Management Regulations Workshop for Design Professionals**
  Workshop is designed to explain the application of floodplain management concepts and regulations to design professionals. Attendees will gain experience with using Flood Insurance Studies and maps.

- **Substantial Damage Assessment Training**
  Onsite training reviews NFIP regulations regarding community post flood responsibilities and teaches local officials how to conduct post flood damage assessment. Assessment is based upon the FEMA designed Residential Substantial Damage Estimator. ODNR staff will work through damage assessment process in affected structures with local officials.

- **Statewide Floodplain Management Conference**
  Two day annual conference provides training on multiple aspects of floodplain management, including NFIP compliance, case studies, mitigation, map modernization, hydrology, hydraulics, technology, etc…

For more information regarding these training opportunities, please contact ODNR's Floodplain Management Program at 614-265-6750, or visit us at http://www.ohiodnr.com/water/floodpln/.

Lender and Insurance Agent Workshops

FEMA sponsors local workshops developed to assist lenders and insurance agents better understand the NFIP policies and regulations (although anyone who works with

[20] Excerpted and adapted from http://www.training.fema.gov/emiweb/

the NFIP may attend). Insurance agent workshops typically focus on insurance coverages, rates, maps, NFIP terminology, and marketing techniques. Lender workshops address the latest information on legislative and compliance requirements as well as information on how the program works, insurance coverages, terminology, and mandatory purchase.

For more information on these local workshops, you may contact:

NFIP Bureau and Statistical Agent
1111 E. Warrenville Road, Suite 209
Naperville, IL 60563
phone: (630) 577-1407
fax: (630) 577-1437

Certified Floodplain Manager (CFM) Program

The ASFPM has established a national program for professional certification of floodplain managers. The program recognizes continuing education and professional development that improves the knowledge and performance of local, state, federal, and private-sector floodplain managers. The Certified Floodplain Manager (CFM) Program was developed to help reduce the nation's flood losses and protect and enhance the natural resources and functions of its floodplains by improving the knowledge and abilities of floodplain managers. The CFM Program also aims to increase the prominence of floodplain management in decision-making by local officials and the public.

The CFM Program is directed toward individuals from varied occupations, interests, and educational backgrounds who have routine floodplain management duties. This includes community/state/federal officials, private citizens and representatives from the private sector, academia, and interest groups. To become a Certified Floodplain Manager, individuals must submit an application to the ASFPM and take the CFM examination. To maintain certification, Certified Floodplain Managers must stay current in their knowledge of floodplain management policies and concepts by attending training, workshops, and conferences approved by the ASFPM for Continuing Education Credit (CEC).[21]

Anyone interested in the CFM Program may refer to the ASFPM website at www.floods.org for more detailed information.

Professional Land Surveyors of Ohio (PLSO)[22]

The Professional Land Surveyors of Ohio (PLSO) is an organization, that provides a forum for its members to express personal, professional and community opinions at local and state levels; educate the general public about the services, activities and legal standards required of the

[21] Excerpted and adapted from www.floods.org
[22] Excerpted and adapted from www.ohiosurveyor.org

Professional Surveyor; and present a unified voice of the profession aimed at bettering the community, the surveying profession and its members.

Professional Surveyors can provide the professional assistance necessary to complete and submit FEMA's Elevation Certificate for verification of structural compliance, interpretation and use of BFE data, and identification and location of SFHAs. For more information regarding Professional Surveyors in your area, you can contact the PLSO at: http://www.ohiosurveyor.org

APPENDIX A:

ACRONYMS AND DEFINITIONS

ACRONYMS AND DEFINITIONS

The following definitions are provided to familiarize the reader with some common terms used in floodplain management.

Accessory Structure
A structure on the same lot with, and of a nature customarily incidental and subordinate to, the principal structure.

Appeal
A request for review of the floodplain administrator's interpretation of any provision of these regulations or a request for a variance.

Backwater
The rise in water surface elevation caused by some obstruction such as a narrow bridge opening, buildings, or fill material that limits the area through which the water must flow.

Base Flood
The flood having a one percent chance of being equaled or exceeded in any given year. The base flood may also be referred to as the 1% annual chance flood or one-hundred (100) year flood.

Base (100-Year) Flood Elevation (BFE)
The water surface elevation of the base flood in relation to a specified datum, usually the National Geodetic Vertical Datum of 1929 (NGVD) or the North American Vertical Datum of 1988 (NAVD), and usually expressed in units of feet. In Zone AO areas, the base flood elevation is the natural grade elevation plus the depth number (from 1 to 3 feet).

Basement
Any area of the building having its floor subgrade (below ground level) on all sides.

Building Code
A collection of regulations adopted by a local unit of government setting forth standards for the construction, addition, modification, and repair of buildings and other structures.

Channel
A natural or artificial depression of perceptible extent, with definite bed and banks to confine and conduct flowing water either continuously or periodically.

Conveyance
A mathematical term applied to the measurement of the carrying capacities of channels and overbank areas. Conveyance is directly proportional to discharge.

Cross Section
A graph or plot of ground elevation across a stream valley or a portion of it, usually along a line perpendicular to the stream or direction of flow.

Development
Any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

Elevation Certificate
A form published by the Federal Emergency Management Agency that is used to certify the 100-year or base flood elevation and the lowest floor (floodproofed level) of a structure.

Enclosure Below the Lowest Floor
See “Lowest Floor.”

Equal Degree of Encroachment
An equal reduction of conveyance for flood flows on each side of a stream. Encroachment lines are used on maps to define the allowable limits of encroachment. The "equal degree of encroachment" for a specified stream reach is determined by evaluating the effects of encroachment on the conveyance of the floodplain along both sides of a stream. (The intent of this principle is to allow an equal decrease in conveyance on each side of a stream. Usually, encroachment lines established using this principle will not be equidistant from their respective sides of the channel.)

Equal Degree of Conveyance Reduction
The same as equal degree of encroachment.

Executive Order 11988 (Floodplain Management)
Issued by President Carter in 1977, this order requires that no federally assisted activities be conducted in or have the potential to affect identified special flood hazard areas, unless there is no practicable alternative.

Federal Emergency Management Agency (FEMA)
The agency with the overall responsibility for administering the National Flood Insurance Program.

Fill
A deposit of earth material placed by artificial means.

Flood *or* Flooding
A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters, and/or
2. The unusual and rapid accumulation or runoff of surface waters from any source.

Flood Elevation

The maximum water surface elevation of a particular flood event at a given location along a stream. The elevations are usually referenced to either NGVD or NAVD national datums.

Flood Frequency
The average frequency, statistically determined, for which it is expected that a specific flood stage or discharge may be equaled or exceeded. The frequency of a particular flood stage or discharge is usually expressed as having a probability of occurring on the average of once within a specified number of years. See also "Recurrence Interval."

Flood Fringe
The portion of the regulatory floodplain outside the floodway. May also be referred to as the floodway fringe.

Flood Hazard Boundary Map (FHBM)
Usually the initial map, produced by the Federal Emergency Management Agency, or U.S. Department of Housing and Urban Development, for a community depicting approximate special flood hazard areas.

Flood Insurance Rate Map (FIRM)
An official map on which the Federal Emergency Management Agency or the U.S. Department of Housing and Urban Development has delineated the areas of special flood hazard.

Flood Insurance Risk Zones
Zone designations on FHBMs and FIRMs that indicate the magnitude of the flood hazard in specific areas of a community. Following are the zone definitions:

Zone A:
Special flood hazard areas inundated by the 100-year flood; base flood elevations are not determined.
Zones A1-30 and Zone AE:
Special flood hazard areas inundated by the 100-year flood; base flood elevations are determined.
Zone AO:
Special flood hazard areas inundated by the 100-year flood; with flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths are determined.
Zone AH:
Special flood hazard areas inundated by the 100-year flood; flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations are determined.
Zone A99:
Special flood hazard areas inundated by the 100-year flood to be protected from the 100-year flood by a Federal flood protection system under construction; no base flood elevations are determined.
Zone B and Zone X (shaded):

Areas of 500-year flood; areas subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than 1 square mile; and areas protected by levees from the base flood.
Zone C and Zone X (unshaded):
Areas determined to be outside the 500-year floodplain.

Flood Insurance Study (FIS)
The official report in which the Federal Emergency Management Agency or the U.S. Department of Housing and Urban Development has provided flood profiles, floodway boundaries (sometimes shown on Flood Boundary and Floodway Maps), and the water surface elevations of the base flood.

Flood Peak
The highest value of stage or discharge attained during a flood event, *i.e.*, peak stage or peak discharge.

Floodplain
The areas adjoining a watercourse that may be inundated during a flood.

Floodplain Administrator
The community official, as designated in a community's flood damage reduction regulations, that has the responsibility for the day-to-day administration of such regulations.

Floodplain Management
A full range of public policy and action for ensuring wise use of the floodplains. It includes: collection and dissemination of flood information, acquisition of floodplain lands through outright purchase or easements, construction of flood control structures, and enactment and administration of codes, ordinances, resolutions, and statutes regarding floodplain land use.

Floodplain Regulations
All codes, ordinances, resolutions, and other regulations relating to land use and construction within the limits of the regulatory floodplain. Also referred to in this document as "flood damage reduction regulations" and "floodplain management regulations."

The ODNR, Division of Water – Floodplain Management Program has produced model Special Purpose Flood Damage Reduction Regulations that meet the minimum Federal standards of the National Flood Insurance Program. These are also referred to in this document as the "model regulations."

Flood Profile
A graph or longitudinal plot of maximum water surface elevations of a flood event versus measured distance along a stream channel from a fixed point. The zero or beginning point is often the mouth of the stream and the elevations are usually referenced to either NGVD or NAVD national datums.

Floodproofing
Any combination of structural and nonstructural additions, changes, or adjustments primarily for the reduction or elimination of flood damages to real property, water and sanitary facilities, structures, and contents of buildings in flood hazard areas.

Flood Protection Elevation
The Flood Protection Elevation, or FPE, is the base flood elevation plus [X] feet of freeboard. In areas where no base flood elevations exist from any authoritative source, the flood protection elevation can be historical flood elevations, or base flood elevations determined and/or approved by the floodplain administrator.

Flood Stage
The height of the water surface above an arbitrary datum where overflow of the natural banks of a stream results in flood damage. As commonly used by the National Weather Service and others, flood stages are referenced to a particular stream gage that is a representative index of a specific reach of a stream.

Floodway
A floodway is the channel of a river or other watercourse and the adjacent land areas that have been reserved in order to pass the base flood discharge. A floodway is typically determined through a hydraulic and hydrologic engineering analysis such that the cumulative increase in the water surface elevation of the base flood resulting from development in the floodplain is no more than a designated height. In no case shall the designated height be more than one foot at any point within the community.

The floodway is an extremely hazardous area, and is usually characterized by any of the following: Moderate to high velocity flood waters, high potential for debris and projectile impacts, and moderate to high erosion forces.

Freeboard
A factor of safety usually expressed in feet above a flood level for the purposes of floodplain management. Freeboard tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, obstructed bridge openings, debris and ice jams, and the hydrologic effect of urbanization in a watershed.

Historic structure
Any structure that is:

1. Listed individually in the National Register of Historic Places (a listing maintained by the U.S. Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listings on the National Register;
2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district; or

3. Individually listed on the State of Ohio's inventory of historic places maintained by the Ohio Historic Preservation Office.
4. Individually listed on the inventory of historic places maintained by the [COMMUNITY NAME] whose historic preservation program has been certified by the Ohio Historic Preservation Office.

Hydrologic and hydraulic engineering analysis
An analysis performed by a professional engineer, registered in the State of Ohio, in accordance with standard engineering practices as accepted by FEMA, used to determine flood elevations and/or floodway boundaries. Hydrologic and hydraulic analyses may also evaluate the impact of proposed development on flood heights.

Letter of Map Change (LOMC)
A Letter of Map Change is an official FEMA determination, by letter, to amend or revise effective Flood Insurance Rate Maps, Flood Boundary and Floodway Maps, and Flood Insurance Studies. LOMC's are broken down into the following categories:

Letter of Map Amendment (LOMA)
A revision based on technical data showing that a property was incorrectly included in a designated special flood hazard area. A LOMA amends the current effective Flood Insurance Rate Map and establishes that a specific property is not located in a special flood hazard area.

Letter of Map Revision (LOMR)
A revision based on technical data that, usually due to manmade changes, shows changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. One common type of LOMR, a LOMR-F, is a determination concerning whether a structure or parcel has been elevated by fill above the base flood elevation and is, therefore, excluded from the special flood hazard area.

Conditional Letter of Map Revision (CLOMR)
A formal review and comment by FEMA as to whether a proposed project complies with the minimum National Flood Insurance Program floodplain management criteria. A CLOMR does not amend or revise effective Flood Insurance Rate Maps, Flood Boundary and Floodway Maps, or Flood Insurance Studies. A CLOMR does not supercede local permit authority.

Lowest floor
The lowest floor of the lowest enclosed area (including basement) of a structure. This definition excludes an "enclosure below the lowest floor" which is an unfinished or flood resistant enclosure usable solely for parking of vehicles, building access or storage, in an area other than a basement area, provided that such enclosure is built in accordance with the applicable design requirements specified in these regulations for enclosures below the lowest floor.

Manufactured home
A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. The term "manufactured home" does not include a "recreational vehicle". For the purposes of these regulations, a manufactured home includes manufactured homes and mobile homes as defined in Chapter 3733 of the Ohio Revised Code.

Manufactured home park
As specified in the Ohio Administrative Code 3701-27-01, a manufactured home park means any tract of land upon which three or more manufactured homes, used for habitation are parked, either free of charge or for revenue purposes, and includes any roadway, building, structure, vehicle, or enclosure used or intended for use as part of the facilities of the park. A tract of land that is subdivided and the individual lots are not for rent or rented, but are for sale or sold for the purpose of installation of manufactured homes on the lots, is not a manufactured home park, even though three or more manufactured homes are parked thereon, if the roadways are dedicated to the local government authority.

National Flood Insurance Program (NFIP)
The NFIP is a Federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the Federal government that states if a community will adopt and enforce floodplain management regulations to reduce future flood risks to all development in special flood hazard areas, the Federal government will make flood insurance available within the community as a financial protection against flood loss.

New construction
Structures for which the "start of construction" commenced on or after the initial effective date of the [COMMUNITY NAME] Flood Insurance Rate Map, [INITIAL FIRM EFFECTIVE DATE], and includes any subsequent improvements to such structures.

NFIP State Coordinator
The state agency/office designated to coordinate the NFIP in Ohio. The ODNR, Division of Water - Floodplain Management Program performs in this capacity.

Person
Includes any individual or group of individuals, corporation, partnership, association, or any other entity, including state and local governments and agencies. An agency is further defined in the Ohio Revised Code Section 111.15 as any governmental entity of the state and includes, but is not limited to, any board, department, division, commission, bureau, society, council, institution, state college or university, community college district, technical college district, or state community college. “Agency” does not

include the general assembly, the controlling board, the adjutant general's department, or any court.

Reach
The term used to describe a longitudinal segment of a stream or river. The selection of a reach for hydraulic study purposes may be influenced by either natural or manmade obstructions. In an urban area, the segment of a stream or river between two consecutive bridge crossings would constitute a typical study reach.

Recreational vehicle
A vehicle which is (1) built on a single chassis, (2) 400 square feet or less when measured at the largest horizontal projection, (3) designed to be self- propelled or permanently towable by a light duty truck, and (4) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Recurrence Interval
The average interval of time, based on a statistical analysis of actual or representative streamflow records, that can be expected to elapse between floods equal to or greater than a specified stage or discharge. The recurrence interval is generally expressed in years. See also "Flood Frequency."

Registered Professional Architect
A person registered to engage in the practice of architecture under the provisions of sections 4703.01 to 4703.19 of the Revised Code.

Registered Professional Engineer
A person registered as a professional engineer under Chapter 4733 of the Revised Code.

Registered Professional Surveyor
A person registered as a professional surveyor under Chapter 4733 of the Revised Code.

Regulatory Floodway
The channel of a river or other watercourse and the adjacent land areas that have been reserved through the legal adoption of land use regulations, in order to pass the base flood discharge. A floodway is typically determined through a hydraulic and hydrologic engineering analysis such that the cumulative increase in the water surface elevation of the base flood resulting from development in the floodplain is no more than a designated height. In no case shall the designated height be more than one foot at any point within the community.

The floodway is an extremely hazardous area, and is usually characterized by any of the following: Moderate to high velocity flood waters, high potential for debris and projectile impacts, and moderate to high erosion forces.

Special Flood Hazard Area
Also known as "Areas of Special Flood Hazard", it is the land in the floodplain subject to a one percent or greater chance of flooding in any given year. Special flood hazard areas are designated by the Federal Emergency Management Agency on Flood Insurance Rate Maps, Flood Insurance Studies, Flood Boundary and Floodway Maps and Flood Hazard Boundary Maps as Zones A, AE, AH, AO, A1-30, and A99. Special flood hazard areas may also refer to areas that are flood prone and designated from other federal state or local sources of data including but not limited to historical flood information reflecting high water marks, previous flood inundation areas, and flood prone soils associated with a watercourse.

Start of construction
The date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of a building.

Structure
A walled and roofed building, manufactured home, or gas or liquid storage tank that is principally above ground.

Subdivision Regulations
Regulations and standards established by a local unit of government to ensure coordinated land development.

Substantial Damage
Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Improvement
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" of the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however, include:

1. Any improvement to a structure which is considered “new construction,”
2. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified prior to the application for a development permit by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or
3. Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure".

Variance
A grant of relief from the standards of these regulations consistent with the variance conditions herein.

Violation
The failure of a structure or other development to be fully compliant with these regulations.

Watercourse
A channel in which a flow of water occurs either continuously or intermittently in a definite direction. The term applies to either natural or artificially constructed channels.

Zoning Ordinance / Resolution
An ordinance or resolution adopted by a local unit of government that regulates the use of land.

APPENDIX B:

FORMS AND CERTIFICATIONS

FLOOD HAZARD AREA DEVELOPMENT PERMIT APPLICATION

Application is hereby made for a DEVELOPMENT PERMIT as required by the Special Purpose Flood Damage Reduction Regulations No. _____ of GLORIA GLENS PARK (village/city/county) for development in an identified flood hazard area. All activities shall be completed in accordance with the requirements of said regulations. The development to be performed is described below and in attachments hereto. The applicant understands and agrees that:

- The permit applied for, if granted, is issued on the representations made herein;
- Any permit issued may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- Any permit issued on this application will not grant any right or privilege to erect any structure or sue any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The applicant hereby gives consent to the Floodplain Administrator to enter and inspect activity covered under the provisions of the floodplain regulations;
- If issued, the FHA Development Permit form will be posted in a conspicuous place on the premises in plain view; and,
- If issued, the permit will expire if no work is commenced within one year of issuance.

Owner's Name: VILLAGE OF GLORIA GLENS Builder/Developer: _____

Address: _____ Address: _____

Phone: _____ Phone: _____

LOCATION OF DEVELOPMENT SITE

1. Location of proposed development site address: _____
2. Legal description: _____

Attach a location map showing the location of the development site relative to adjacent sites. A location map may be a copy of the tax or plat map, including scale, showing the parcel where development activity will occur.

DESCRIPTION OF WORK

3a. Kind of development proposed (check all that apply):

□ Residential structure
- □ New structure
- □ Addition to structure
- □ Renovations/repairs/maintenance
- □ Manufactured home installation

□ Non-residential structure
- □ New structure
- □ Addition to structure
- □ Renovations/repairs/maintenance

□ Accessory structure: Dimensions: _____

□ Filling or grading

□ Dredging or excavation or mining

□ Materials/equipment storage: Describe type _____

□ Watercourse alteration (any change that occurs within the banks of a watercourse)

□ Water supply / sewage disposal

□ Bridge or culvert placement / replacement

□ Subdivision greater than 50 lots or 5 acres

□ Other development greater than 5 acres

☒ Other: _____

Additional activity description: _____

_____

3b. If the proposed construction is an addition, renovation, repair or maintenance to an existing structure, indicate the cost of proposed construction $_____. What is the estimated market value of the existing structure $N/A?

NOTES AND ADDITIONAL SUBMITTAL REQUIREMENTS:

- *In addition to completion of this form the applicant agrees to submit any additional information required by the floodplain administrator in order to determine that the proposed development is compliant with the local and federal flood damage prevention criteria of the National Flood Insurance Program. Site plans for all development proposals must:*
  - *Be drawn to scale with north arrow.*
  - *Show property boundaries, floodway, and floodplain lines.*
  - *Show dimensions of the lot.*
  - *Show dimensions and location of existing and/or proposed development on the site.*
  - *Show areas to be cut and filled.*

- *Applications for residential and non-residential structures must also include:*
  - *The proposed lowest floor elevation based on the datum used on the effective Flood Insurance Rate Map and base flood elevation for the site.*
  - *Identification of whether the structure has a basement or enclosure below the lowest floor, and if it contains a basement or enclosure, detailed drawings showing foundation openings to allow passage of floodwaters.*
  - *Description of how building utilities will be protected from flood waters including drawings showing locations of such utilities.*
  - *Detailed description of anchoring system for all mobile and manufactured homes.*
  - *Description of construction materials that will be used below the flood protection elevation.*

- *An existing structure must comply with the flood protection standards if it is substantially improved (an improvement equal to or greater than 50% of the market value of the structure). The "substantial improvement" definition applies to existing structures only and that once a structure meets the definition of "new construction" any further improvements to that structure must meet "new construction" requirements. For floodplain management purposes "new construction" means structures for which "start of construction" began on or after the effective date of the initial Flood Insurance Rate Map issued by FEMA for the community.*

- *Any Pre-FIRM structure within the FHA that has sustained damage from any source (flood, fire, etc…) must be evaluated to determine if the structure is "substantially damaged" (damaged to 50% or more of the market value of the structure). If the structure is "substantially damaged, the structure must be brought into compliance with the flood protection standards.*

- *For subdivision proposals greater than 5 acres or 50 lots, or large-scale developments greater than 5 acres, a hydrologic and hydraulic analysis must be conducted to determine base flood elevations in flood hazard areas where no base flood elevations are provided.*

- *A Conditional Letter of Map Revision (CLOMR) must be obtained for proposed projects that would result in more than a 1.0 foot increase in BFE on a watercourse that has been studied through detailed hydrologic and hydraulic analyses where BFEs have been specified, but no floodway has been designated* ***OR*** *when a project proposed (totally or partially within the floodway) along a waterocurse for which detailed analyses have been conducted and BFEs and a floodway have been designated would result in any (greater than 0.0 foot) increase in the BFE.*

- *Applications for non-residential structures proposed to be floodproofed must have a completed FEMA floodproofing certification form attached (can only be completed by a Registered Professional Engineer or Architect).*

- *All development proposals determined to be located in a floodway must be accompanied by a hydrologic and hydraulic analysis showing impacts on of the development on flood heights (can only be completed by a Registered Professional Engineer).*

- *Development proposals that are considered alterations of a watercourse must be accompanied by an analysis showing that the flood carrying capacity of the watercourse has not been reduced.*

I AGREE THAT ALL STATEMENTS IN AND ATTACHMENTS TO THIS APPLICATION ARE A TRUE DESCRIPTION OF THE EXISTING PROPERTY AND THE PROPOSED DEVELOPMENT ACTIVITY. I UNDERSTAND THE DEVELOPMENT REQUIREMENTS FOR SPECIAL FLOOD HAZARD AREA ACTIVITIES PER THE APPROPRIATE ORDINANCE OR RESOLUTION AND AGREE TO ABIDE THERETO. I UNDERSTAND IT IS MY RESPONSIBILITY TO OBTAIN ALL OTHER APPLICABLE FEDERAL, STATE AND LOCAL PERMITS.

Applicant's Signature: _____

Date: ____/_____/_____

FLOOD HAZARD AREA DEVELOPMENT PERMIT
ADMINISTRATIVE CHECKLIST

NOTE: The following is to be completed by the local floodplain administrator. All references to elevations are in feet mean sea level (m.s.l.) according to the datum used on the effective Flood Insurance Rate Maps.

1. The proposed development is in:
   - ____ An identified floodway.
     - Does a hydrologic and hydraulic engineering analysis accompany the application Y / N
     - Does the analysis have a certification that flood heights will not be increased Y / N
     - Is the analysis certified by a Registered Professional Engineer Y / N
   - ____ A flood hazard area where base flood elevations exist with no identified floodway.
     - Does a hydrologic and hydraulic engineering analysis accompany the application Y / N
     - Does the analysis have a certification that flood heights will be increased less than the height designated in the community's flood damage reduction regulations (in no case will this be more than one foot) Y / N
     - Is the analysis certified by a Registered Professional Engineer Y / N
   - ____ An area within the floodplain fringe.
   - ____ An approximate flood hazard area (Zone A).
   - ____ Within the banks of a watercourse.
     - Does an analysis demonstrating that the flood carrying capacity has not been diminished accompany the application Y / N

   Base flood elevation (100-year) at proposed site _____ feet m.s.l.
   Data source _____
   Map effective date _____ Community-Panel No. _____

2. Does proposed development meet NFIP and local "Use and Development Standards" of your regulations?
   - _____ Permitted Use.
   - _____ Water and wastewater systems standards met.
   - _____ Subdivision standards met (All public utilities and facilities safe from flooding, adequate drainage, flood elevations generated where applicable.
   - _____ Residential/non-residential structures standards met. Lowest floor elevation _____ feet m.s.l.
     - Substantial improvement / substantial damage Y / N
     - Anchored properly (manufactured home affixed to permanent foundation) Y / N
     - Utilities protected against flooding Y / N
     - Construction materials below flood protection elevation resistant to flood damage Y / N
     - Lowest floor elevated to or above flood protection elevation (BFE + freeboard) Y / N
     - Has an enclosure below lowest floor (crawl space, walkout basement) Y / N
       - Enclosure have proper number and area of openings Y / N
       - Enclosure unfinished and only used for parking, materials storage or entry Y / N
   - _____ Accessory structure standards met (square footage, use, foundation openings). Y / N
   - _____ Recreational vehicle standards met.
   - _____ Above ground gas or liquid storage tank anchored.
   - _____ Flood carrying capacity maintained for floodway development, areas where FEMA has provided BFE data but no floodways, or for alterations of a watercourse.

3. Does proposed development trigger requirement to submit a Letter of Map Revision or Conditional Letter of Map Revision? Y / N

DECISION RECORD

4. The proposed development is in compliance with applicable floodplain standards. **FLOOD HAZARD AREA DEVELOPMENT PERMIT ISSUED ON____**.

5. The proposed development is not in compliance with applicable floodplain standards. **FLOOD HAZARD AREA DEVELOPMENT PERMIT DENIED ON** _____. Reason(s):
   _____

6. The proposed development is exempt from the floodplain standards per Section_____ of the Flood Damage Prevention Ordinance (Resolution) No._____.

Administrator's Signature:_____ Date:_____

FLOOD HAZARD AREA DEVELOPMENT PERMIT

This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the _____ (Community Name) Flood Damage Reduction Regulations.

Address or property location: _____

Description of development activity: _____

_____

The permittee understands and agrees that:

- An as-built Elevation Certificate will be submitted to the Floodplain Administrator after the first floor of a new, substantially improved, or substantially damaged, residential or non-residential structure is constructed;
- A final Letter of Map Revision will be obtained where a Conditional Letter of Map Revision was required as part of the permit application;
- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the codes or regulations of the community;
- The permittee hereby gives consent to the Floodplain Administrator to enter and inspect activity covered under the provisions of the Floodplain Management Regulations;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within one year of issuance.

Issued by: _____ Date:_____
Floodplain Administrator

Permit Number:_____

VARIANCE / APPEAL APPLICATION AND RECORD

A *variance* is a grant of relief given by a community from the terms of specific standards required in its floodplain regulations. The issuance of a variance is for floodplain management purposes only. Insurance premium rates are determined by the Federal government according to actuarial risk and will not be modified by the granting of a variance. ANY VARIANCE GRANTED BY A COMMUNITY MUST BE CONSISTENT WITH THE NFIP GUIDELINES AND WITH LOCAL LAW.

1. Name of applicant: _____

2. Specify the section of the floodplain regulations from which a variance is sought:_____

_____

3. Explain how proposed development would vary from the provisions of the floodplain regulations:

_____

_____

4. Explain the hardship imposed if a strict application of the floodplain regulations is enforced:

_____

_____

NOTE: *Applicant may attach any additional supporting documents and data he/she feels necessary to help explain this project and variance request.*

AN APPLICANT RECEIVING A VARIANCE TO BUILD A STRUCTURE WITH THE LOWEST FLOOR ELEVATION BELOW THE BASE FLOOD ELEVATION (100-YEAR) IS HEREBY NOTIFIED THAT THE REDUCED FLOOR ELEVATION WILL RESULT IN INCREASED PREMIUM RATES FOR FLOOD INSURANCE UP TO AMOUNTS AS HIGH AS $25 PER $100 OF INSURANCE COVERAGE. CONSTRUCTION BELOW THE BASE FLOOD LEVEL INCREASES RISKS TO LIFE AND PROPERTY.

AS PROVIDED IN CHAPTER 2506 OF THE OHIO REVISED CODE, THOSE AGGRIEVED BY THE DECISION OF THE APPEALS BOARD MAY APPEAL SUCH DECISIONS TO THE COUNTY COURT OF COMMON PLEAS.

_____/_____/_____ _____/_____/_____

Applicant's Signature Date Administrator's Signature Date

RECORD OF VARIANCE ACTIONS (Floodplain Administrator complete)

Variance request submitted to on _____. Variance hearing on _____

In accordance with the criteria and guidelines of _____(Community Name) Flood Damage Reduction Regulations, the Appeal Board hereby [ ] approves, [ ] denies the above request for variance.

_____/_____/_____

Chair, Appeals Board Date

Decisions of the board: _____

_____

Special Provisions of Variance Approval: _____

_____

Note: For permit file purposes, attach the official hearing record and ensure that the eleven variance evaluation factors in the community's flood damage reduction regulations have been considered and are included in the written record.

GUIDANCE FOR "NO-RISE" CERTIFICATION FOR PROPOSED DEVELOPMENTS IN REGULATORY FLOODWAYS

Note: This guidance was adapted from that issued by FEMA Region IV in 2004.

Section 60.3 (d) (3) of the National Flood Insurance Program (NFIP) regulations states that a community shall *"prohibit encroachments, including fill, new construction, substantial improvements, and other developments within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base (100-year) flood discharge."* All communities in Ohio that participate in the NFIP have this provision contained in their Flood Damage Reduction Regulations.

Prior to issuing any building grading or development permits involving activities in a regulatory floodway, the community must obtain a certification stating the proposed development in the floodway will not impact the pre-project base flood elevations, floodway elevations, or floodway widths. The certification should be obtained from the permittee and signed and sealed by a registered Professional Engineer.

The engineering or "no-rise" certification must be supported by technical data. The supporting technical data should typically be based upon the standard step-backwater computer model utilized to develop the 100-year floodway shown on the community's effective Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM) and the results tabulated in the community's Flood Insurance Study (FIS).

Although communities are required to review and approve the "no-rise" submittals, they may request technical assistance and review from the ODNR, Division of Water.

The engineering "no-rise" certification and supporting technical data must stipulate NO IMPACT on the 100-year flood elevation, floodway elevations, or floodway widths at the new cross-sections and at all existing cross-sections anywhere in the model. Therefore, the revised computer model should be run for a sufficient distance (usually 1-mile, depending on hydraulic slope of the stream) upstream and downstream of the development site to ensure proper "no-rise" certification.

Attached is a sample "no-rise" certification form that can be completed by a registered Professional Engineer and supplied to the community along with the supporting technical data when applying for a floodplain development permit.

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of Ohio. It is to further certify that the attached technical data supports the fact that proposed development:_____ in the floodway will
(Name of Development)

not increase the Base Flood Elevations (100-year flood), floodway elevations and the floodway widths on _____ at published sections in
(Name of Stream)

the Flood Insurance Study for _____, dated _____
(Name of Community)

and will not increase the Base Flood Elevations (100-year flood), floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Date _____

Signature _____

Phone Number _____ ***EMAIL*** _____

Representing _____

Address _____

City_____ ***State*** _____ ***Zip Code*** _____

CERTIFYING SEAL OR STAMP

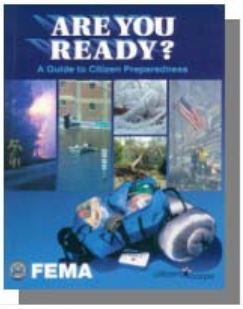
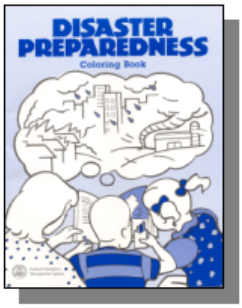
APPENDIX C:

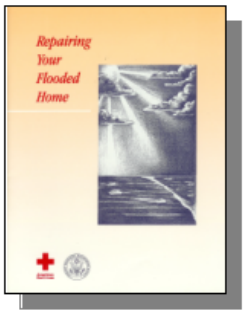
PUBLICATIONS LISTS

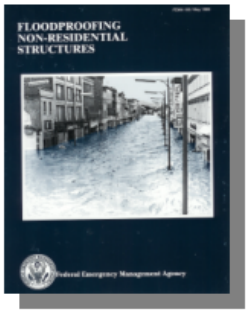
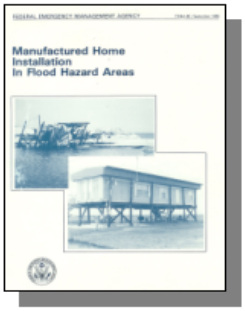
FEMA Publications

This sheet is designed to hi-light some of the more popular FEMA reference materials. Use this checklist as an aid to obtain free copies of these documents, videotapes or CD-ROMs. Contact FEMA's Publications Distribution Facility and request the listed publication number when placing an order by phone from your home/office. Internet site addresses are also listed to assist consumers with online downloading/printing of these informational education guides.

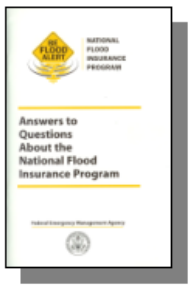
Simply call 1-800-480-2520 to speak with a helpful FEMA customer service representative.

	Quantity
 Disaster Public Information Catalog L-164 http://online.fema.net/arp/ppg-1.htm	_____
 Are You Ready? A Guide to Citizen Preparedness H-34 www.fema.gov/areyouready	_____
 Preparing Makes Sense - Get Ready Now (booklet) 1-800-237-3239 www.ready.gov	_____
 Disaster Preparedness Coloring Book FEMA-243 / 8-1123 www.fema.gov/kids/games/colorbk/index.htm	_____

	Quantity
 After a Flood: The First Steps (brochure) ARC 4476 / FEMA L-198 www.fema.gov/pdf/hazards/fststpbr.pdf	_____
 Repairing Your Flooded Home ARC 4477 / FEMA 234 www.redcross.org/services/disaster/afterdis/repflhm.pdf www.fema.gov/hazards/floods/lib234.shtm	_____
 Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding (brochure) FEMA L-235 www.fema.gov/pdf/hazards/hurricanes/l-235.pdf	_____
 Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding FEMA 312 www.fema.gov/hazards/floods/lib312.shtm	_____
 Protecting Building Utilities From Flood Damage: Principles and Practices for the Design and Construction of Flood Resistant Utility Systems FEMA 348 www.fema.gov/hazards/floods/lib06b.shtm	_____
 FEMA for Kids 2000 (CD-ROM) 9-1456 www.fema.gov/kids	_____

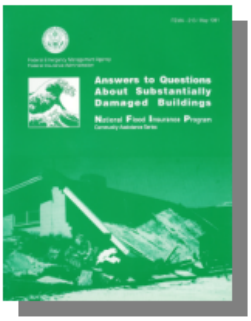
	Quantity
 Above the Flood: Elevating Your Floodprone House FEMA 347, 347CD (CD-ROM) or 347VT (Videotape) www.fema.gov/hazards/floods/lib347.shtm	_____
 Floodproofing Non-Residential Structures FEMA 102 www.fema.gov/hazards/floods/lib102.shtm	_____
 Manufactured Home Installation in Flood Hazard Areas FEMA 85 www.fema.gov/hazards/floods/lib85.shtm	_____
 Hazard Mitigation Grant Program (brochure) L-169 www.fema.gov/pdf/library/hazmit.pdf	_____
 Flood Mitigation Assistance (brochure) L-221 www.fema.gov/pdf/fima/fma_broch2.pdf	_____
 Mitigation Resources for Success (CD-ROM) FEMA 372 www.fema.gov/pdf/library/poster_fnl2.pdf www.fema.gov/fima/success.shtm	_____

Quantity



Answers to Questions About the National Flood (booklet) Insurance Program
FEMA-387 / F-084
www.fema.gov/nfip/qanda.shtm

_____



Answers to Questions About Substantially Damaged Buildings
FEMA 213
www.fema.gov/hazards/floods/lib213.shtm

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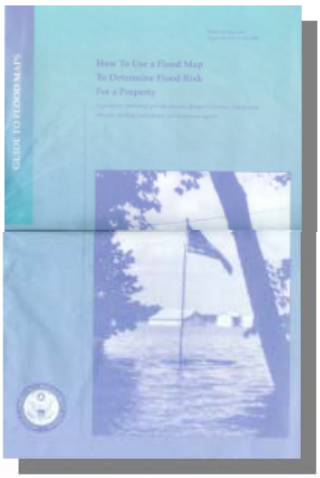
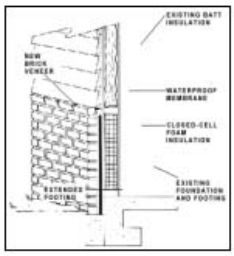
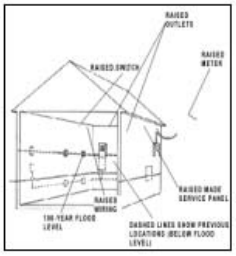
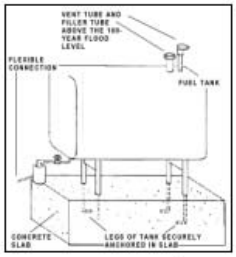


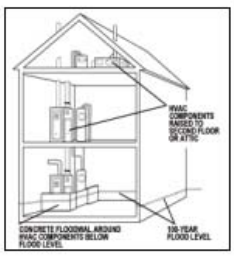
How To Use a Flood Map To Determine Flood Risk For a Property
FEMA 258

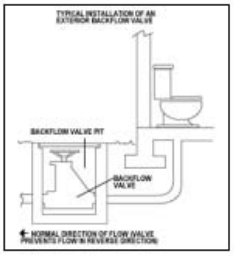
_____









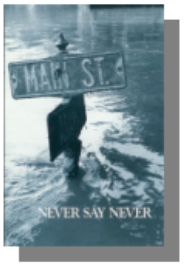


"How To Series" – Two-pagers describing concisely how to mitigate loses
www.fema.gov/fima/how2.shtm

Protecting Your Property From Flooding

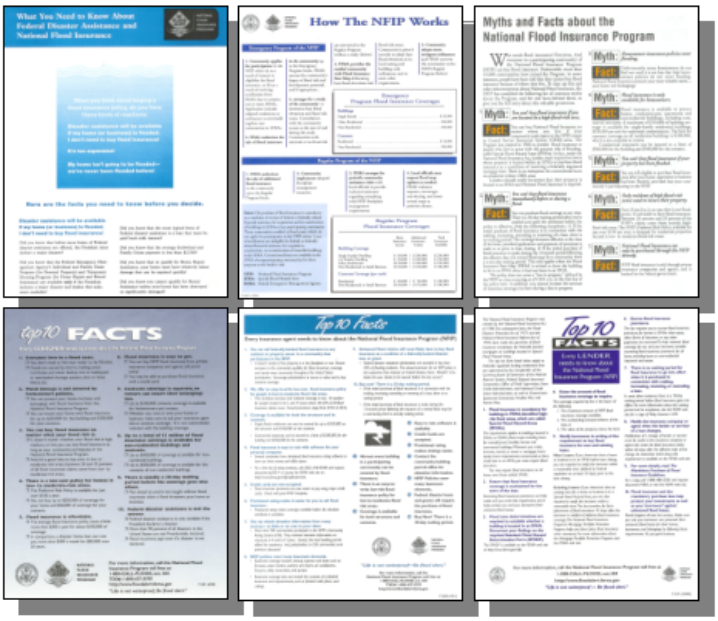
- Exterior Walls
- Electrical System
- Fuel Tanks
- HVAC Equipment
- Sewer Backflow Valves

Quantity



Never Say Never (brochure)
40-001-50 _____

F-206 - Coping With a Flood – Before, During and After (brochure) _____
F-207 - Who Is at Risk for Flooding? (brochure) _____
F-208 - Things You Should Know About Flood Insurance (brochure) _____
F-209 - Flood: Are You Protected From the Next Disaster? (brochure) _____
F-210 - Tips on Handling Your Flood Insurance Claim (brochure) _____
300 - How You Can Benefit from the New Increased Cost Of Compliance Endorsement (brochure) _____



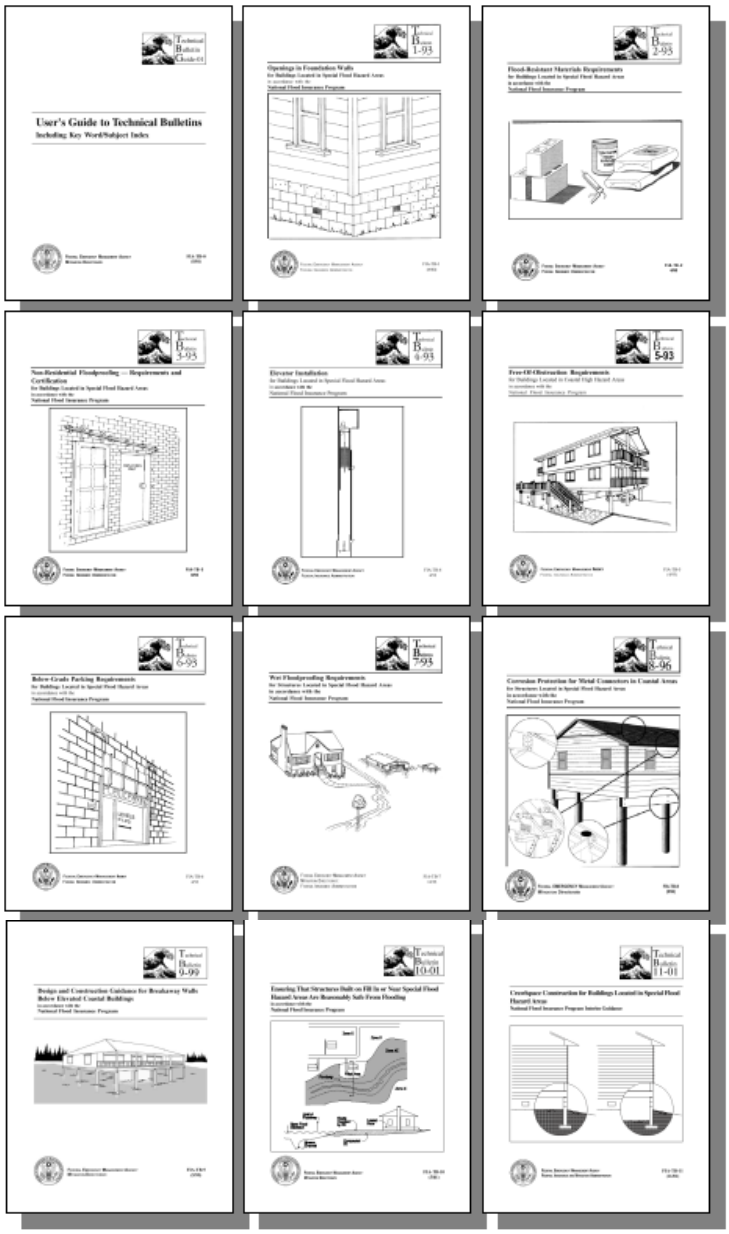
_____ _____ _____

_____ _____ _____

Single-Page "Fact Sheets" – NFIP informational flyers

F-001 - What You Should Know About Federal Disaster Assistance and National Flood Insurance
F-025 - How the NFIP Works
F-002 - Myths and Facts about the National Flood Insurance Program
F-301 - Top 10 Facts Every CONSUMER needs to know about the NFIP
F-068 - Top 10 Facts Every INSURANCE AGENT needs to know about the NFIP
F-215 - Top 10 Facts Every LENDER needs to know about the NFIP

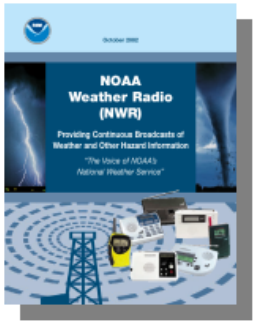
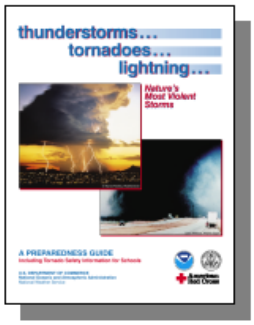
"Technical Bulletins" – Guidance on NFIP regulations
www.fema.gov/fima/techbul.shtm



Quantity		

FIA-TB-0 - User's Guide to Technical Bulletins
FIA-TB-1 - Openings in Foundation Walls
FIA-TB-2 - Flood-Resistant Materials Requirements
FIA-TB-3 - Non-Residential Floodproofing – Requirements and Certification
FIA-TB-4 - Elevator Installation
FIA-TB-5 - Free-of-Obstruction Requirements
FIA-TB-6 - Below-Grade Parking Requirements
FIA-TB-7 - Wet Floodproofing Requirements
FIA-TB-8 - Corrosion Protection for Metal Connectors in Coastal Areas
FIA-TB-9 - Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings
FIA-TB-10 - Ensuring that Structures Built on Fill In or Near Special Flood Hazard Areas are Reasonably Safe From Flooding
FIA-TB-11 - Crawlspace Construction for Buildings Located in Special Flood Hazard Areas

	Quantity
 Your Family Disaster Plan (brochure) FEMA L-191 / ARC 4466 www.redcross.org/services/disaster/beprepared/fdpall.pdf	_____
 Your Family Disaster Supplies Kit (brochure) FEMA L-189 / ARC 4463 www.redcross.org/disaster/safety/fdsk.pdf	_____
 Emergency Preparedness Checklist (brochure) FEMA L-154 / ARC 4471 www.redcross.org/services/disaster/foreignmat/epceng.pdf	_____
 Are You Ready for a Flood or a Flash Flood? (brochure) NOAA PA 92059 / ARC 4458 www.redcross.org/services/disaster/keepsafe/readyflood.pdf	_____
 Are You Ready for a Thunderstorm? (brochure) NOAA PA 93051 / ARC 5009 www.redcross.org/services/disaster/keepsafe/readythunder.pdf	_____
 Floods…The Awesome Power *(A Preparedness Guide)* ARC 4493 / NOAA/PA 200253 www.nws.noaa.gov/om/brochures/Floodsbrochure_9_04_low.pdf	_____

	Quantity
 Flash Floods and Floods…The Awesome Power *(A Preparedness Guide)* NOAA/PA 92050 www.fiu.edu/orgs/w4ehw/flood%20guide%20noaa.pdf	_____
 NOAA Weather Radio…The Voice of the National Weather Service NOAA/PA 200356 www.nws.noaa.gov/om/brochures/nwr_brochure.pdf	_____
 Thunderstorms…Tornadoes…Lightning…Nature's Most Violent Storms *(A Preparedness Guide)* NOAA/PA 99050 / ARC 1122 www.nws.noaa.gov/om/brochures/ttl.pdf	_____
 Thunderstorms and Lightning…The Underrated Killers! *(A Preparedness Guide)* NOAA/PA 92053 / ARC 5001 www.nws.noaa.gov/om/brochures/tstorm.pdf	_____
 Tornadoes…Nature's Most Violent Storms *(A Preparedness Guide)* NOAA/PA 92052 / ARC 5002 ftp://ftp.nws.noaa.gov/om/brochures/tornado.pdf	_____

Quantity

Safe Room & Community
Shelter Resources (CD-ROM)
FEMA 388-CD
www.fema.gov/pdf/hazards/saferoom.pdf

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Taking Shelter From the Storm: Building a Safe Room
Inside Your House (brochure)
L-233
www.fema.gov/pdf/hazards/ismtri.pdf

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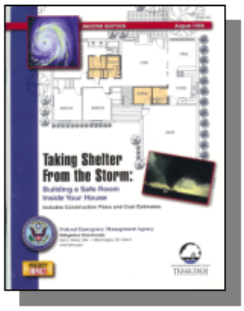

Taking Shelter From the Storm: Building a
Safe Room Inside Your House
FEMA 320
www.fema.gov/fima/tsfs02.shtm

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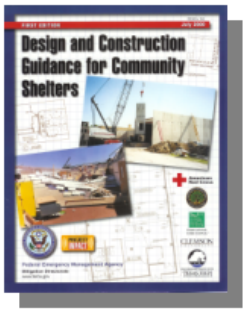

Design and Construction Guidance for
Community Shelters
FEMA 361
www.fema.gov/fima/fema361.shtm

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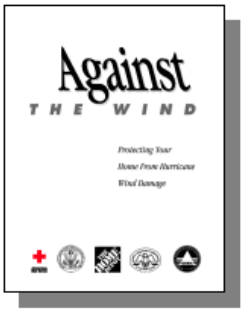

Against the Wind: Protecting Your Home from
Wind Damage
ARC 5023 / FEMA 247
www.redcross.org/services/disaster/beprepared/agnstwd.pdf

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Are You Ready for a Tornado? (brochure)
NOAA PA 92057 / ARC 4457
www.redcross.org/services/disaster/keepsafe/readytornado.pdf

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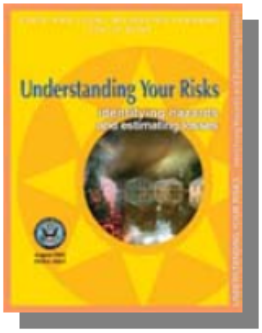
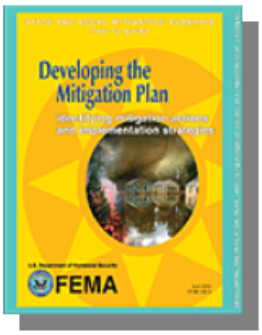
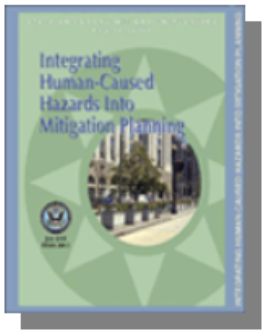
	Quantity
 Getting Started: Building Support for Mitigation Planning - How-To Guide #1 FEMA 386-1 www.fema.gov/fima/planning_toc5.shtm	_____
 Understanding Your Risks: Identifying Hazards and Estimating Losses - How-To Guide #2 FEMA 386-2 www.fema.gov/fima/planning_toc3.shtm	_____
 Developing The Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies - How-To Guide #3 FEMA 386-3 www.fema.gov/fima/planning_howto3.shtm	_____
 Integrating Human-Caused Hazards Into Mitigation Planning - How-To Guide #7 FEMA 386-7 www.fema.gov/fima/planning_toc6.shtm	_____

ASSOCIATION OF STATE FLOODPLAIN MANAGERS, INC.

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Phone: 608-274-0123 Fax: 608-274-0696 Email: asfpm@floods.org

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COMMON LEGAL QUESTIONS ABOUT FLOODPLAIN REGULATIONS IN THE COURTS– Tri-fold question and answer brochure, download FREE here http://www.floods.org/NoAdverseImpact/FLOODPLAIN_REG_IN_COURTS_050604.pdf	1-99 hard copies are $1.00 each; Order of 100 or more are 50¢ each	
LEGAL QUESTIONS: GOVERNMENT LIABILITY AND NO ADVERSE IMPACT FLOODPLAIN MANAGEMENT– Tri-fold question and answer brochure, download FREE at http://www.floods.org/NoAdverseImpact/NAI_Legal_QA_050604.pdf	1-99 hard copies are $1.00 each; Order of 100 or more are 50¢ each	
NO ADVERSE IMPACT: A TOOLKIT FOR COMMON SENSE FLOODPLAIN MANAGEMENT, 2003 –A full color publication designed to assist local and state floodplain managers implement the No Adverse Impact approach to floodplain management, download FREE here http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf	Single Copy $10; CD ROM (Features interactive links), $5 each; Box of 49 (includes a 4-hour training power point and a CD) $300	
NO ADVERSE IMPACT: COMMUNITY LIABILITY AND PROPERTY RIGHTS: ***As Mayor or County Commissioner, should you worry about your liability in the event of a flood?*** **2003** –A four page full color flyer, download FREE here http://www.floods.org/NoAdverseImpact/NAI_Legal_Issues.pdf	1-99 copies are 50¢ each; 100 or more are $25 per 100	
NO ADVERSE IMPACT STATUS REPORT: HELPING COMMUNITIES IMPLIMENT NAI, 2002 15-page full color report highlights five communities that are implementing NAI floodplain management, download FREE here http://www.floods.org/NoAdverseImpact/NAI_Status_Report.pdf	1-99 hard copies are $2 each; 100 or more are $1.75 each	
NO ADVERSE IMPACT: A COMMON SENSE STRATEGY FOR PROTECTING YOUR PROPERTY, 2001 Full color, four-page tabloid style publication aimed at educating the public and local officials about the NAI approach	Single copy $1.00; bulk orders 50¢ each (includes shipping)	
NAI 2002 IMAGE POSTER (24" X 36")	1-99(folded) $2.00 each; 100 or more (folded) $1.75 each; Frame- ready copy $4.00 each	

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	Members	Non-Members
SPECIAL PUBLICATIONS		
⭐**FLOODPLAIN MANAGEMENT 2003: State and Local Programs** –The most complete national summary of the practice of floodplain management at the state and local levels. This report was previously compiled in 1995, 1992, and 1989. Download FREE at http://www.floods.org/PDF/FPM_2003_Final.pdf - **FLOODPLAIN MANAGEMENT 1995: State and Local Programs** - **FLOODPLAIN MANAGEMENT 1992: State and Local Programs** - **FLOODPLAIN MANAGEMENT 1989: State and Local Programs**	$10 $10 $10 $10	$15 $15 $15 $15
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⭐**MITIGATION SUCCESS STORIES**– Compendium of examples which showcase natural hazard mitigation activities and publicize the success of mitigation activities across the US. (ASFPM Mitigation Committee) To download this report FREE click here http://www.floods.org/PDF/Success%20Stories%20IV_Final.pdf	CD 10.00 Book 20.00	CD 15.00 Book 25.00
COMMUNITY FLOOD MITIGATION TRAINING VIDEO–2000 Two part video and instructional pamphlet guiding community-based mitigation. This is an orientation to mitigation planning and how to initiate a planning committee. (Wendy Blackwell, French Wetmore, ASFPM, Public Entity Risk Institute)	12.00	12.00
NATIONAL FLOOD PROGRAMS IN REVIEW–2000 The report describes some of the key changes in federal floodplain management policy and programs over the last several years and identifies improvements that would help the nation move toward a future that includes sustainable floodplain lands and disaster-resilient communities. (ASFPM Task Force, 2000)	20.00 (Hard Copy)	25.00 (Hard Copy)
THE NATION'S RESPONSES TO FLOOD DISASTERS: A HISTORICAL ACCOUNT–2000 A report to reflect a balanced and accurate account of the forces and events that have changed floodplain management in the U.S. during the past 150 years. (Jim Wright; ASFPM, 2000.)	10.00	15.00
FLOODPLAIN MANAGEMENT: State and Local Programs The most comprehensive source assembled to date, this report summarizes and analyzes various state and local programs and activities. ASFPM will update this	20.00	25.00

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	Members	Non-Members
report as soon as funding is obtained. (Jacki Monday; ASFPM, 1996)		
☆**USING MULTI-OBJECTIVE MANAGEMENT TO REDUCE FLOOD LOSSES IN YOUR WATERSHED** - A citizens guidebook. Introduction to multi-objective management and planning process that helps a community select suitable flood loss reduction measures. (French Wetmore; ASFPM; EPA, 1996) To download it FREE click here http://www.floods.org/PDF/Using_MOM_in_Watershed.pdf	12.00	15.00
☆**ADDRESSING YOUR COMMUNITY'S FLOOD PROBLEMS: GUIDE FOR ELECTED OFFICIALS** - to help officials take action now and try to ward off problems from future flooding. (James Wright, Jacki Monday; ASFPM, Federal Interagency Task Force, 1997). To download this report FREE click here http://www.floods.org/PDF/Addressing_Communitys_Flood_Problems.pdf	$5.00 each	
FLOODS, FLOODPLAINS AND FOLKS Features 19 multi-objective project descriptions. (National Park Service, ASFPM, Association of State Wetland Managers and FEMA, 1996)	Please pay Shipping/Handling	

ASFPM CONFERENCE PROCEEDINGS		
2004 Lighting the Way to Floodplain Management, Biloxi, MS *(available May 1, 2005)*	CD 15.00 Book 27.00	CD 15.00 Book 27.00
2003 Lessons Learned: Gateway to Flood Mitigation, St. Louis, MO	CD 15.00 Book 27.00	CD 15.00 Book 27.00
2002 Breaking the Cycle of Repetitive Loss, Phoenix, Arizona	CD 15.00 Book 27.00	CD 15.00 Book 27.00
2001 New Trends in Floodplain Management, Charlotte, North Carolina	CD 15.00 Book 27.00	CD 20.00 Book 32.00
2000 Floodplain Management 2000 and Beyond: A New Beginning in a New Millennium, Austin, Texas	CD 15.00 Book 27.00	CD 20.00 Book 32.00
99 Planning Ahead: Reducing Flood Losses in the 21st Century, Portland, Oregon	25.00	30.00
98 Times are Changing, Flood Mitigation Technology, Milwaukee, WI	23.00	28.00
97 FPM in a Multi-Faceted World, Little Rock, Arkansas	20.00	25.00
96 Coast to Coast: 20 Years of Progress, San Diego, California,	20.00	25.00
95 From the Mountains to the Sea: Developing Local Capabilities, Portland, Maine	20.00	25.00
94 Nania: Comprehensive Watershed Management, Tulsa, OK	16.00	18.00
93 Cross Training: Light The Torch, Atlanta, GA	13.00	16.00
Land Use and Flood Damages in Arid & Semi-Arid Areas, 1992 ASFPM Arid West Flood Conference, Las Vegas, NV (ASFPM) 1994	15.00	20.00
Arid West Floodplain Management Issues, ASFPM/AFMA Conference in Las	15.00	20.00

ASFPM TECHNICAL REPORTS		
#1 An Assessment of Urban Floodplain Management in the U.S. - The Case for Land Acquisition in Comprehensive FPM (Burby, Kaiser; ASFPM) 1987	5.00	7.00
#2 Flood Planning Assistance to Small Towns (Wetmore; ASFPM) 1987	5.00	7.00
#3 Disaster Assistance Center (DAC) Mitigation Tables: The 1987 Illinois Experience (Wetmore; ASFPM) 1989	7.00	9.00
#4 Homeowner Floodproofing Behavior (Laska, Wetmore; ASFPM) 1989	7.00	9.00
#5 HOW TO . . . Organize and Submit Technical Documentation for Flood Studies, (Morris; ASFPM) 1992	7.00	9.00
#6 Terminology & Standards for Community-Level Flood Preparedness Programs, (ASFPM Mitigation Committee 1993)	7.00	9.00
ASFPM TOPICAL REPORTS		
#1 Report On Questionnaire On Substantial Improvement (Davison, Keptner, Borengasser; ASFPM) 1990	3.00	4.00
#2 Federal Assistance Programs For Sewer Flooding (Eveready Flood Control, French & Associates; ASFPM) 1990	3.00	4.00
#3 Issues to Floodproof Retrofitting (Wallace A. Wilson; ASFPM) 1990	3.00	4.00
#4 NFIP Regulations: What You'd Change If You Could (Keptner; ASFPM) 1991	3.00	4.00
#5 The Community Rating System: A True Story, Local Economic Application (Mike Klitzke; ASFPM) 1992	4.00	5.00
#6 Flood Damage Reduction and Wetland Conservation, Three Successful Projects in Louisiana (Rod Emmer; ASFPM) 1994	4.00	5.00
OTHER PUBLICATIONS OF ASFPM		
Mitigation Planning Workshop Materials, Materials from one-day workshop, San Diego, June 1996. (Wetmore; ASFPM)	20.00	25.00
Primer for Hosting Buyouts Workshop, based on experience/evaluation of '93 floods workshop, January 1994. (Philipsborn; ASFPM)	20.00	25.00
MODEL STATE LEGISLATION for Floodplain Management, Basic Regulation Statutes & Innovative Techniques (ASFPM)	Please pay Shipping/Handling	
Multi-Objective River Corridor Planning, Proceedings of the multi-objective workshops in Knoxville, TN and Colorado Springs, CO, March 1989. (Eve Gruntfest, ASFPM)	10.00	12.00
Evaluating the Effectiveness of Floodplain Management Techniques and Community Problems, Proceedings of seminar by TVA and Interagency FPM Task Force, April, 1984. (TVA; Haz. Ctr.)	5.00	8.00
Floodplain Management Research Needs - From a Survey of State and Local Managers (Burby; ASFPM)	N/C	N/C
Long-Term Recovery From Natural Disasters: A Comparative Analysis of Six Local Experiences (Claire B. Rubin, Academy for Contemporary Problems; NSF, FEMA) 1981	N/C	N/C
Come Rain, Come Shine - A Case Study of A Floodplain Relocation Project at Soldiers Grove, WI. (Wis. DNR, FEMA) 1982	N/C	N/C

National Flood Proofing Committee Publications

Flood proofing is an important Flood Plain Management measure that can be used to reduce flood damages to buildings and their contents.

The **National Flood Proofing Committee** was established by the Corps of Engineers through its Flood Plain Management Services Program to promote the development and use of proper flood proofing techniques throughout the United States. It is comprised of a group of highly qualified Corps of Engineers employees experienced in Flood Plain Management and selected from various Division and District offices Nation-wide.

National Flood Proofing Committee Activities:

The Committee performs a variety of activities, such as:

- Providing a source of technical expertise on flood proofing.
- Conducting research and development on new, innovative, and/or unique materials and technologies for flood proofing.
- Developing flood proofing workshops, seminars, and short courses to educate state agencies, local officials, and private citizens.
- Working with state and Federal agencies and local officials to develop and conduct workshops and counseling sessions which provide individual flood proofing information.
- Documenting flood proofing activities and disseminating flood proofing publications.

National Flood Proofing Committee Publications:

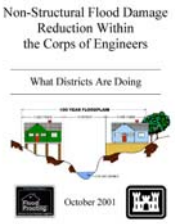
A color brochure is available which describes the NFPC and its activities. Please note that the brochure is meant to be one page, printed back-to-back and tri-folded, so the text will appear to be out of sequence if viewed on-line.

The National Flood Proofing Committee has compiled a Bibliography of selected flood proofing publications. In addition, the following publications are generally available from the Corps of Engineers:

To access the publications below, click the following link:

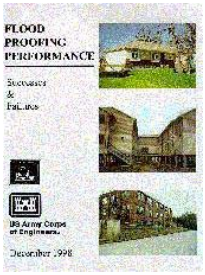
Corps of Engineers National Flood Proofing Committee Publications

Nonstructural Flood Damage Reduction Projects (What the Corps is doing)



The Corps of Engineers National Flood Proofing Committee (NFPC) has recognized that sharing successful non-structural information within the Corps of Engineers may be very helpful to Districts that are considering non-structural alternatives. The NFPC has compiled into this document applicable portions of reports developed by various Districts that show how non-structural projects were formulated, justified, and implemented. Some projects documented were formulated and justified in complete accord with Corps criteria. Other projects documented have not been but were developed in specific response to Congress. Examples of both are included to show the wide range of implementation procedures and authorities that have been used by Districts to make successful non-structural projects.

Flood Proofing Performance - Successes & Failures

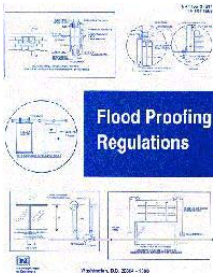


1998, 116 pages. This report describes how flood proofing measures perform when they are actually tested by floodwater. It provides a general overview of flood proofing techniques, and includes a list of flood proofing "Do's and Don'ts" compiled as a result of the research involved in preparing this publication. Chapter 2 provides in-depth evaluation of the performance of flood proofing measures on 98 different structures.

Flood Proofing Techniques, Programs, and References

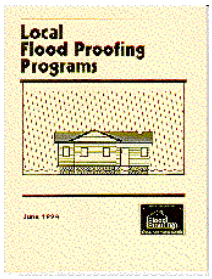
1996, 25 pages. This report addresses the approaches to flood proofing and government flood proofing programs, references, and terminology. It presents a general overview of flood proofing techniques and provides the reader information on government agencies that offer more specific assistance and publications containing detailed flood proofing information.

Flood Proofing Regulations



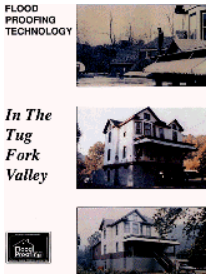
1995, 45 pages. A definitive work by the Corps of Engineers that provides construction specifications for flood proofing new buildings. It includes detailed lists of materials for areas to be wet flood proofed. The manual is organized to facilitate easy adoption by reference to a building code and provides both technical data and guidelines for ordinance administration. Illustrated with line drawings.

Local Flood Proofing Programs



1994, 28 pages. This publication is intended to assist local communities in developing their own flood proofing programs. It identifies the factors that communities should consider in establishing flood proofing programs, overviews case studies of existing programs, and contains examples of pertinent documents used by various communities in developing their programs.

Flood Proofing Technology in the Tug Fork Valley

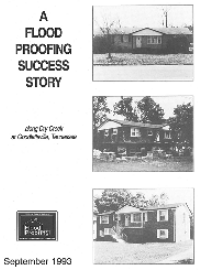


1994, 20 pages. Important technical and administrative lessons learned are documented in this publication for flood proofing structures located in Williamson and Matewan, West Virginia, and South Williamson, Kentucky, as part of the flood damage reduction plan for the Tug Fork River Basin. It also contains an excellent display of how residential structures look after they have been raised for flood proofing, a primary concern of homeowners.

Flood Proofing - How to Evaluate Your Options

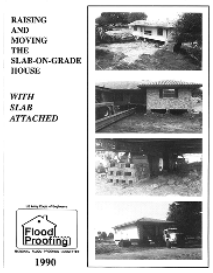
1993, 32 pages. This publication is intended to assist property owners, engineers, and contractors in determining whether or not flood proofing is appropriate and which flood proofing technique is the best measure to consider. A detailed explanation is contained on how to evaluate flood proofing options and how to conduct a benefit/cost analysis.

A Flood Proofing Success Story Along Dry Creek at Goodlettsville, Tennessee



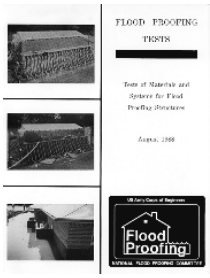
1993, 17 pages. A documentation of innovative procedures used to reduce the costs of a flood damage reduction project along Dry Creek at Goodlettsville, Tennessee. The appendices contain samples of documents used in the project and an equation that can be used by others to quickly estimate the approximate costs of flood proofing selected homes by raising them in place. The cost-estimating equation, however, is applicable only to one-story, brick veneer homes with crawl spaces and in sound structural condition.

Raising and Moving a Slab-on-Grade House with Slab Attached



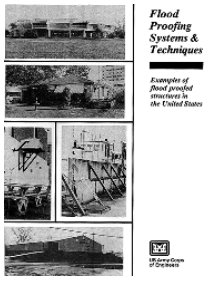
1990, 28 pages. This report discusses the procedures for raising or relocating "slab-on-grade" structures with the slab attached. It points out advantages and disadvantages, suggests factors to consider, and indicates possible costs involved. The procedures and techniques described are based primarily on those employed by a professional structural mover operating in the Tampa, Florida area.

Flood Proofing Tests - Tests of Materials and Systems for Flood Proofing Structures



1988, 89 pages. This report presents test results which describe materials and systems that can be used to protect buildings from floodwaters. Closures, materials, and systems were tested to determine the effectiveness in protecting homes or businesses from floodwaters, with conclusions provided for each test.

Flood Proofing Systems & Techniques - Examples of Flood Proofed Structures in the US



1984, 100 pages. An illustrated, easy-to-read review of 40 different buildings that have been elevated, dry and wet flood proofed, leveed, or otherwise protected. Buildings include new construction and flood proofed houses, businesses, schools, office buildings, and factories. Narratives include costs. Many examples include photos of flooding.

Flood Proofing Information From The Corps of Engineers:

For National Flood Proofing Committee publications, flood proofing workshops, etc., contact the Flood Plain Management Services Program Manager at your local Corps Division or District office.

For information about National Flood Proofing Committee activities, write:

Corps of Engineers, CECW-PD
National Flood Proofing Committee
441 G Street, NW
Washington, DC 20314-1000

Natural Hazards Center

The Natural Hazards Research and Applications Information Center at the University of Colorado at Boulder is an excellent resource for many publications on floods and floodplain management. Since 1976, the Natural Hazards Research and Applications Information Center (NHRAIC) has served as a national and international clearinghouse of knowledge concerning the social science and policy aspects of disasters. The Center collects and shares research and experience related to preparedness for, response to, recovery from, and mitigation of disasters, emphasizing the link between hazard mitigation and sustainability to both producers and users of research and knowledge on extreme events.

A basic goal of the Center is to strengthen communication among researchers and the individuals, organizations, and agencies concerned with reducing damages caused by disasters. More than a quarter century of cultivating discourse among these groups has placed NHRAIC center-stage in both the national and global hazards communities.

The center's website is full of hazards research and information, containing thousands of links, publications, and information on recent development in hazards research and practice. It also maintains one of the largest library collections in the world of research and public policy documents relating to natural hazards and emergency management.


Natural Hazards Observer

FEMA Update
The View from the Top

The Center's bi-monthly newsletter, the Natural Hazards Observer, contains information on all types of natural hazards including some of the latest research findings, policy directions, and publications reviews.

Website:
http://www.colorado.edu/hazards/

APPENDIX D:

FACT SHEETS

Division of Water
Floodplain Management

PUBLICATIONS

Publications from the ODNR Division of Water programs can be accessed at: http://www.dnr.state.oh.us/water/floodpln/

Floodplain Program Publications include:

- **Ohio Floodplain Management Handbook**
- **Fact Sheets**
  - 92-12 Floods and Flood Damage Prevention
  - 92-13 Facts About Flood Insurance
  - 93-21 How to Obtain Flood Maps
  - 96-40 Post-Disaster Floodplain Management
  - 97-42 Community Rating Systems and Flood Hazard Mitigation
  - 98-50 Natural Benefits of Floodplains
  - Engineering Submittals for Floodplain Review: OEPA-DEFA Projects
  - Floodplain Reviews for Manufactured Home Parks
- **Floodplain Administrators List**
- **Conference Information**
- **Ohio Map Modernization Program Information**
- **Antediluvian Newsletter & Archive**
- **Statewide Community Floodplain Compliance List**
- **Preliminary Flood Insurance Rate Maps for Ohio**
- **Mitigation Planning: How-to for Local Communities**
- **Model Floodplain Regulations**
- **Map Needs Update Support System (MNUSS)**
- **Ohio Natural Hazard Mitigation Planning Guidebook Interim Guidance**

The Division of Water's website is updated with new information and publications regularly. If you have questions, please contact 614-265-6750.

APPENDIX E:

FEMA VARIANCE GUIDELINES
April 1998

FEMA – Variance Guidelines
April 1998

INTRODUCTION

The Federal Emergency Management Agency (FEMA) does not set forth absolute criteria for granting variances from the floodplain management provisions of Title 44 CFR, §60.3, §60.4, and §60.5. However, general variance criteria have been established in the NFIP regulations under §60.6 (a). These criteria provide the basis for each community participating in the NFIP to determine if a structure qualifies for a variance from the local floodplain management regulations. The variance criteria are a compilation of standards most frequently found in State variance law, coupled with specific floodplain management standards.

In all cases, the responsibility to approve or disapprove a variance rests on the community, not FEMA. However, FEMA evaluates variances granted by a community to determine if they are consistent with the objective of sound floodplain management. The variance criteria are intended to inform participating communities of the guidelines that FEMA will use in such an evaluation.

To ensure consistency with sound floodplain management, communities should issue variances only on a finding of good and sufficient cause, exceptional hardship, and a determination that variance will not result in additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances. In addition, a variance should be the minimum necessary, considering the flood hazard, to afford relief.

If the criteria at §60.6 (a) are closely adhered to, variances that completely waive the substantive NFIP requirements which provide protection to the 100-year standard should be quite rare. In most cases some lower level of protection or alternative methods to provide comparable protection will be available.

DESCRIPTION AND INTENT OF THE REGULATIONS COVERING VARIANCES

The NFIP variance criteria are based on the general principal of zoning law that variances pertain to a piece of property and are not personal in nature. Though standards vary among States, in general a properly issued variance is granted for a parcel of property with physical characteristics so unusual that complying with the ordinance would create an exceptional hardship to the applicant or the surrounding property owners. Those characteristics must be unique to that property and not be shared by adjacent parcels. The unique characteristics must pertain to the land itself, not to the structure, its inhabitants or the property owners. Therefore, financial hardship or the health condition of the property owner alone are never sufficient causes for granting a variance.

It is common practice for some administrative bodies to grant variances for zoning, property setback, and nonhealth and safety regulations based on personal criteria and the character of the owner rather than the nature of the property. However, granting a variance from NFIP floodplain management standards on these grounds would rarely be an appropriate action. Such action, would not be consistent with the community's need to ensure public safety.

Once the character of the owner changes (i.e., the property is sold, leased, etc.) the justification for a variance based on personal considerations no longer exists. Because the structure remains, future owner/occupants are exposed to the nonconforming nature of the property and whatever hazards and public safety problems are associated with it. This exposure to flood risk is unnecessary because the sole reason for granting the variance was the personal condition of the previous owner.
The variance criteria in §60.6(a) must be read as a whole and not piecemeal. Variances can be granted for new construction and substantial improvements only if all criteria in §60.6(a) and the local ordinance are met. If any one of the criteria is not met the variance should not be granted.

Floodways - §60.6 (a) (1)

The floodway is defined (§59.1) as:

> "the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height."

It is important to reserve the floodway as a water conveyance area because any encroachments or obstructions placed in the floodway will increase flood heights and consequently flood damages. Thus, at §60.6 (a) (1):

> "Variances shall not be issued by a community within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result."

The intent of this variance criterion is to prohibit non-conforming development that may increase flood levels which in turn would increase potential flood damages to other property owners.

In most cases there will be alternative locations for the proposed development outside the floodway, or other actions can be taken to compensate for increased flood stages or the floodway can be modified through flood control measures. If there is no feasible or practical alternative site to locate the development, then it must meet all criteria under §60.6 (a) and, in accord with §60.6 (d) (3), demonstrate that no increase in flood stages will result. Section 60.3 (d) (3) states that:

> "the community shall prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway that would result in any increase in flood levels within the community during the occurrence of the base flood discharge."

The only exceptions to this provision, located in §§60.3 (c) (13) and (d) (4) of the NFIP regulations, allow for the increases in flood levels under certain conditions and upon approval by the administrator.

In cases where all variance criteria in §60.6 (a) are met and a "no-rise" analysis and certification has been approved, the community may find it appropriate to issue a variance. However, because of the potential hazards involved, many states and communities exceed minimum NFIP requirements by prohibiting the issuance of variances for floodway development altogether, regardless of whether all variance criteria are met and a "no-rise" certification was made. Therefore, a community may wish to prohibit all variance requests based on three potential flood hazards in the floodway:

1. The hazard to the development itself;
2. The increased hazard which the development may cause to other properties;
3. The risk to individuals stranded in isolated structures surrounded by what is in many cases rapidly flowing, debris laden flood waters, and the risk to the rescue workers.

For example, the granting of a variance which allows the placement of a manufactured home below the BFE in a floodway will place the lives of its inhabitants at risk because during a flood it is likely that the manufactured home will be totally demolished. Aside from this danger, experience has shown that a manufactured home can float into other manufactured or conventional homes and result in severe structural damage; or, become wedged in a bridge opening or culvert, which could in turn dramatically increase flood heights upstream and endanger other citizens. Also, local emergency service personnel may be endangered attempting to rescue the occupants before the manufactured home is carried downstream.

Because of the hazards of granting variances for development in the regulatory floodway, community officials should carefully consider all of the possible dangers created by the variance issuance. In most cases, a review will indicate that the benefits of allowing the development are outweighed by the costs of increased future flood damage and increased hazards to life.

Lots of One-Half Acre or Less - §§60.6 (a) and (a) (2)

> "While the granting of variances generally is limited to a lot size less than one-half acre (as set forth in paragraph (a) (2) of this section), deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases."

> "Variances may be issued by a community for new construction and substantial improvement to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the procedures of paragraphs (a) (3), (4), (5) and (6) of this section."

A common, but unjustifiable argument for variance requests on lots of less than ½ acre is one based on personal convenience or aesthetics; i.e., the height inconsistency that would result between adjacent structures if the middle one was elevated to or above the BFE. Aesthetics or other personal considerations should never be a consideration when making variance determinations on ½ acre lots. Section 60.6 (a) (2) only addresses the physical, not the aesthetic characteristics of a lot in relation to the adjacent lots. In balancing considerations for personal issues versus issues related to public health and safety such as minimum NFIP criteria, a community should always choose public safety and the protection of lives and property.

The intent of the above variance criteria has been misinterpreted to mean that variances can be systematically granted for all intermediate or "in-fill" subdivision lots of less than ½ acre. Variances on "in-fill" lots of less than ½ acre are not automatic. The intent of §60.6 (a) (2) is not to place a lesser (or no) burden on ½ acre lots, but a greater burden on lots larger than ½ acre. Note that §60.6 (a) specifically states that "as the lot size increases beyond ½ acre, the technical justification required for issuing a variance increases."

The ½ acre threshold pertaining to lot size is meant to be a general cutoff point and, as §60.6 (a) states, "deviations from that limitation may occur." However, experience shows that for intermediate lots greater than ½ acre, a structure can, in nearly all instances be elevated on fill to or above the BFE without causing measurable drainage impacts to the adjacent structures whose lowest floor elevations are at or below grade. Because of the additional storage and infiltration capacity provided by larger lots, and because of the flexibility in being able to choose a least-impactive location on a large lot, the technical justification required for issuing a variance based on potential drainage problems increases as the lot size increases beyond ½ acre. However, conditions will vary based on the size of the structure relative to the size of the lot, as well as, the location of the structures relative to each other.

Many design and construction alternatives exist that will ease a hardship caused by potential drainage problems, while still allowing a structure in this situation to be built in full compliance with NFIP regulations. There are several acceptable elevation techniques that cause no more, and usually less disruption of drainage patterns than building a structure at ground level through a variance. Examples include: 1.) elevation of the structure on pilings, columns, or extended foundation walls; 2) grading or landscaping the elevated fill pad to drain away form the adjoining properties; and 3) creation of natural or artificial infiltration fields or systems located at the intersection of the fill slope and the natural ground. Many of these type alternatives can be cost

effective as well as visually appealing in the community, while still not creating drainage problems for adjacent structures.

In summary, the granting of variances for small lots where elevation on fill will pose an exceptional hardship due to drainage problems should be rare. Variances for “in-fill” lots of ½ acre or less should be granted on the basis of potential drainage problems only 1) if, as §60.6 (a) (2) explicitly states, all other criteria [§§60.6 (a) (3), (4), (5), and (6)] are met, and 2) if a professional engineer or architect has prepared and certified data demonstrating that there are no technically feasible methods available to alleviate or mitigate the drainage problems.

Good and Sufficient Cause - §60.6 (a) (3) (i)

> “Variances shall only be issued by a community upon a showing of good and sufficient cause.”

A variance request by an applicant that is based on good and sufficient cause is one that deals solely with the physical characteristics of the property, subdivision lot, or land parcel under question. A rendering of a good and sufficient cause should never be based on the character of the planned construction or substantial improvement, the personal characteristics of the owner or inhabitants, or local provisions that regulate non -health and public safety standards (e.g., aesthetic restrictions of subdivision homeowner associations).

“Good and sufficient” cause means that by granting a variance there is substantial and legitimate benefit to be achieved by numerous other citizens, or the community as a whole. It is not merely based on the convenience or financial relief that the variance would afford the applicant. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, the disapproval of one’s neighbors, or homeowners’ association restrictions, likewise do not, as a rule, qualify as “good and sufficient” causes. “Good and sufficient” cause for a variance occurs when a parcel of property possesses physical characteristics so unusual that complying with NFIP regulation in a local ordinance would create an exceptional hardship to the applicant, the surrounding property owners, or the community in general. In addition, the unusual physical characteristics must be unique to that property and not be shared by adjacent parcels or be typical of other lots in the community.

Physical conditions are inherent to the land or property and usually will not change or be significantly altered over time. Therefore, the justification for granting a variance based on physical characteristics will usually not be undermined over time. In contrast, personal characteristics and intended uses of buildings can change dramatically with changes in ownership. Likewise, local aesthetic and other non -health and safety restrictions are frequently altered over short periods of time. Thus, the justification for granting variances based on characteristics other than the physical conditions of the property can rapidly compromised.

Once the character of the owner changes (i.e., the property is sold, leased, etc. or the owner no longer suffers from financial hardship) the justification for the variance no longer exists, but the structure remains. Future owner/occupants are exposed to the nonconforming nature of the property and whatever hazards and public safety problems are associated with it. This exposure to property and personal risk from flood damage is unnecessary except for the personal condition of the previous owner.

A common misinterpretation of what constitutes "good and sufficient cause" for granting a variance is based on the financial status or other monetary circumstances of the owner. Financial hardship of the property owner is never a good and sufficient cause for granting a variance. Granting a variance for construction in a flood hazard area based on financial hardship only increases the probability that owners least able to afford it will suffer even greater monetary adversity (not to mention health and safety risks) when the structure is damaged during a flood.

Exceptional Hardship - §60.0 (a) (3) (ii)

> "Variances shall only be issued by a community upon a determination that failure to grant the variance would result on exceptional hardship to the applicant."

In determining whether or not an applicant has established an exceptional hardship sufficient to justify a variance, the variance or appeal board or other local governing body must weigh the applicant's hardship against community goals and the purpose of their floodplain management ordinance. In the case of variances form NFIP flood elevation or floodproofing requirements, this would mean asking which is more serious: the hardship that this individual applicant would face, or the community's need for strictly enforced regulations that protect its citizens form the dangers and damages of flooding? Only a truly exceptional, unique hardship relative to the physical character of a piece of property should persuade local officials to set aside provisions of an ordinance designed with the whole community's safety in mind.

The hardship might not have to be so severe if the applicant were seeking a variance to a setback ordinance, for instance, which was intended merely to simplify street repair and modifications. In the course of considering variances to flood protection ordinances, however, variance boards continually must face the more difficult task of frequently having to deny requests form applicants whose personal circumstances evoke compassion, but whose hardships are simply not sufficient to justify deviation form community-wide flood damage prevention requirements.

The hardship that would result from failure to grant a requested variance must be exceptional, unusual, and peculiar to the property involved. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, the disapproval of one's neighbors, or homeowners association restrictions likewise cannot, as a rule, qualify as exceptional hardships. All of these problems can be resolved through other means, without granting a variance. This is so even if the alternative means are more expensive or complicated than building with a variance, or if they require the property owner to put

the parcel to a different use than originally intended, or to build his or her home elsewhere.

For example, a situation in which it would cost a property owner several thousand dollars more to elevate a house to comply with the ordinance and an additional several thousand to build a wheelchair ramp or an elevator to provide access to that house for a handicapped member of the family might at first glance seem like the sort of problem that could be relieved by a variance. However, while financial considerations are always important to property owners and the needs of the handicapped person certainly must be accommodated, these difficulties do not put this situation in the category of "exceptional hardships" as they relate to variances. This is because the characteristics that result in the hardship are personal (the physical condition and financial situation of the people who propose to live on the property) rather than pertaining to the property itself. Also, the problem of the day-today access to the building can be alleviated in any one of a number of ways (going to the additional expenses of building a ramp or elevator), without granting a variance. In fact, one method which facilitates the use of a structure for handicapped persons (especially those in wheel chairs) is to elevate the structure by means of earthen fill.

Third, the situation of handicapped persons occupying flood-prone housing raises a critical public safety concern. If a variance is granted and the building is constructed at grade, it will be absolutely critical that the handicapped or infirm person evacuate when floodwaters begin to rise, yet he or she may be helpless to do so alone. Not only does this pose an unnecessary danger to handicapped persons but also it places an extra demand on the community's emergency service personnel who may be called upon. If the building is properly elevated, the handicapped person can still be evacuated if there is sufficient warning and assistance available. If there is not, that person can, in all likelihood survive the flood simply by remaining at home safely above the level of the floodwaters.

More simply, the property owner's difficulties would not really be relieved by the variance, but likely only postponed and perhaps ultimately increased. It would be more prudent over the long run for the property owner and the community, if the variance were denied and the home built at the proper elevation with handicapped access. This will ensure the safety of all family members when floodwaters rise and also protect individual and community investment in the property, as discussed in the paragraphs on public safety and nuisances.

Another common argument for variances from the elevation requirement is the unaesthetic height differential with adjacent structures that would result. To promote architectural and aesthetic consistency, homeowners associations or subdivision boards frequently place restrictions on landscaping and construction practices, such as the total height to which structures can be built. The owner, and usually the prospective neighbors and local homeowners association, protest that the structure, if elevated, will be architecturally out of sync with the rest of the structures on the block and that property values will be decreased as a result.

Variance requests that claim exceptional hardships due to architectural considerations or conflicts with local subdivision regulations governing aesthetics should never be granted to waive regulations designed to protect the health and safety of residences. For the following reasons a community would be remiss in its responsibilities to its citizens if it placed appearance before public protection:

1. The hardship would be based on personal preference, not the property per se;

2. Most structures can be elevated such that they are aesthetically pleasing and architecturally consistent, despite the height difference;

3. Elevated structures are much less prone to flood damage, and, therefore, actually increase in value relative to adjacent unprotected structures, especially after they are damaged in a flood;

4. The health and safety risks placed on occupants of the unprotected structure are unnecessary and avoidable.

Increased Flood Heights - §60.6 (a) (3) (iii)

> "Variances shall only be issued by a community upon a determination that the granting of a variance will not result in increased flood heights."

A development for which a variance is to be granted must not in any way cause an increase in water surface elevations during floods of any magnitude, not just the base flood. Therefore, for a community to grant a variance, all other variance criteria in Section 60.6 (a) must be met, and the applicant must demonstrate through technical justification that the proposed development will not increase flood heights.

The underlying principal is that an increase in flood heights has the potential to cause flood damage to structures in the community that otherwise would not be flood-prone. In addition, it has the potential to increase the depth of flooding, and thus the damage potential, of structures that are already flood-prone.

To allow increases in flood heights to occur unnecessarily is inconsistent with the objectives of sound floodplain management, and undermines the community's previous efforts to protect structures by requiring elevation or floodproofing to or above the BFE. Increases in flood heights subtract from the level of protection provided by these requirements.

Public Safety and Nuisances - §60.6 (a) (3) (iii)

> "A variance will not cause additional threats to public safety or create nuisances."

Variances must not result in additional threats to public safety or create nuisances. Local flood damage prevention ordinances (including elevation and floodproofing requirements) are intended to help protect the health, safety, well being, and property of the local citizens. This is a long range community effort usually made up of a combination of approaches such as adequate drainage systems, warning and evacuation plans, keeping new property (especially homes) above the flood levels, and participating in an insurance program. These long-term goals can be met if exceptions to the laws are kept to a bare minimum.

Variances to allow the construction of habitable structures below the BFE, especially in the higher hazard areas such as floodways, places residents of those structures at much greater personal risk. The potential for loss of life is much greater in structures whose first floor is below the BFE, and where flood depths are greater than three feet or velocity is present. A community which grants variances to waive elevation requirements in these situations is doing a disservice to its citizens. **In addition, a community may be held liable for personal injuries or loss of life which occurs to occupants of structures for which a non-compliant variance has been granted**.

It is often argued that variances to waive the elevation requirement should be granted for structures where handicapped or elderly persons will be occupants. The basis for this argument is that elevation of the structure will make wheelchair access difficult (i.e., long and expensive ramps) or that elderly people are not physically capable of climbing stairs. However, for the same exact reasons, handicapped and elderly people are much less able to quickly evacuate flood-prone structures. They are much more likely to become trapped inside structures if not aware of the imminent and worsening flood hazard or when flood waters rapidly rise. Therefore, it is difficult to imagine a case where a variance would be appropriate for structures when there is to be handicapped and/or elderly occupancy.

Not only does a community's public safety commitment apply to residents of structures located in flood hazard areas, but also to local emergency services personnel. Variances from the elevation requirement increase the risk exposure for personnel required to rescue residents of structures flooded because of the variance. Simply, if structures are elevated to or above the BFE, residents can in all likelihood, survive the flood by remaining at home safely above the level of the waters. The necessity to rescue residents of elevated structures is not as great and local emergency services personnel can concentrate their efforts to areas of greater need.

Public Expense – §60.6 (a)(3)(iii)

> "Variances shall only be issued by a community upon a determination that the granting of a variance will not result in extraordinary public expense."

The public expense is usually monetary (government funds), but can also be non-monetary. An example of extraordinary public expense is the repair or replacement of public facilities and infrastructure damaged by a flood because of a variance issuance.

Another example is the construction of flood control projects or other public works to protect structures prone to flooding because of the issuance of variances. There are also public costs associated with emergency floodproofing measures such as sandbags and temporary floodwalls built (with public funds) to protect structures flooded because they were issued a variance from elevation requirement.

The time and equipment expended by emergency services personnel during the rescue of residents of flooded structures is significant public expense. This time and expense is unnecessary, and therefore "extraordinary", if it is spent rescuing residents of structures for which variances were granted. There is also a significant "missed opportunity" (non monetary) public expense if an otherwise avoidable injury or death occurs while rescue personnel are busy evacuating structures for which variances were issued.

National expenditures in the form of various Federal disaster assistance programs (e.g., FEMA, SBA, etc.), nongovernment assistance (e.g., Red Cross), and other charity donations are also public expenses. Residents of structures flooded because of the issuance of variances may be entitled to one or more of these many forms of assistance; an increased public expense that, without a variance issuance, could be avoided. Specifically, residents of flooded structures (for which variances have been granted) may qualify for personal grants and monies to provide temporary housing under the terms of FEMA's Disaster Assistance Program.

Another form of public expense occurs when owners of heavily damaged structures (for which variances were granted) can not afford repairs, and abandon them. When local government is held responsible for repair or demolition (which is usually the case)' the additional expense incurred by the public should be considered "extraordinary" because it would not have occurred had a variance not been issued.

Fraud and Victimization - §60.6(a)(3)(iii)

> "Variances shall only be issued by a community upon a determination that the granting of a variance will not cause victimization of the public."

When considering a variance request, local variance boards should consider the fact that every newly constructed building adds to the local government responsibilities and remains a part of the community for fifty or more years. Buildings that are permitted to be constructed below the base flood elevation are subject during all those years to increased risk of damage from floods, while future owners of the property and the community as a whole are subject to all the costs, inconvenience, danger, and suffering that those increased flood damages bring.

One of the biggest potential problems involving variances is the change of ownership of a structure for which a variance has been granted. Future owners that purchase the property may be unaware that it is subject to potential flood damages and can be insured only at very high flood insurance rates. Frequently, resale happens after the structure has been flooded. The original owner repairs the structure and removes all

evidence of previous flooding. The structure is then put up for sale in an attempt to "unload" it on prospective buyers that are new to the area or who are otherwise unfamiliar with extent and nature of the local flood hazard.

An example of public victimization is the case of a variance request to waive elevation requirements for mini-warehouse. The units or "bays" of the warehouse are rented to the public for various personal uses such as the storage of excess furniture. Granting a variance in this case would create the potential for victimization of citizens who, unknowing of the flood hazard and the risk to their property, rent units to store their possessions. When the warehouse is flooded and its contents (which are not covered by flood damage by a homeowner's policy) are damaged, the owners may have no recourse for financial compensation. In addition, many stored possessions that are damaged may be family heirlooms, have sentimental or historic value, or otherwise be irreplaceable. Variances that have the potential to cause this type of victimization or fraud on the public should never be granted.

Existing Local Laws or Ordinances – §60.6(a)(3)(iii)

> "Variances shall only be issued by a community upon a determination that the granting of a variance will not result in conflict with existing local laws or ordinances."

A community is authorized to grant variances from their local floodplain ordinances provided that the variance is not in conflict with other existing Federal or State laws and regulations that, by statute, the community is required to obey and enforce. Examples of local laws protecting environmental and other natural resources. In addition, variances granted by a community must comply with the provisions of State zoning and enabling legislation and case law.

Minimum Necessary to Afford Relief – §60.6 (a)(4)

The variance that is granted should be for the minimum deviation from the local requirements that will still alleviate the hardship. In the case of variances to an elevation requirement, this means the community need not grant permission for the applicant to build at grade or even to whatever elevation the applicant proposes, but only to that level that will both provide relief and preserve the integrity of the local ordinance.

For example, if the BFE is ten feet above natural grade, and only a three-foot waiver is necessary to avoid a legitimate hardship, then the community should require that the structure be elevated seven feet. Or, using this example, if the structure had to be built on grade to afford relief, the variance should still stipulate that all utilities and finished interior workings (and other damageable property) be elevated to or above the BFE (or to the maximum extent possible or practically feasible) in order to reduce the potential of flood damage.

The variance must be the absolute minimum necessary to relieve the hardship, which means the absolute maximum to prevent or reduce future flood damages. When a variance waiving the elevation/dry floodproofing requirements is granted, the "minimum necessary" includes the implementation of 1) "wet floodproofing" techniques and/or 2) provisions in §60.3(a)(3) which require the structure to:

> "(i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, (ii) be constructed with material resistant to flood damage, (iii) be constructed by methods and practices that minimize flood damages, and (iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding."

In summary, very rarely will there be justification to grant a "blanket variance" which waives all NFIP requirements. There will almost always be something that can feasibly done to the structure to reduce the potential for flood damages.

<u>Disclosure – §60.6(a)(5), §60.22 (c)(3)(ii)</u>

Community officials must notify the applicant that the issuance of a variance to construct a structure below BFE will result in increased premium rates for flood insurance and that such construction below BFE increases risks to life and property.

Specifically, it is stated in §60.0(a)(5) that:

> "a community shall notify the applicant in writing over the signature of the community official that (i) the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as $25 for $100 of insurance coverage and (ii) such construction below the base flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions as required in paragraph (a)(6) of this section."

In addition, under §60.22 (c) (3)(ii), "Planning Considerations in Flood Prone Areas", it is recommended that a community consider implementing:

> "full disclosure to all prospective and interested parties (including but not limited to purchasers and renters) that variances have been granted for certain structures located within flood-prone areas."

Such a disclosure is important and necessary to inform subsequent buyers of structures for which a variance was granted to build below BFE.

From a public safety standpoint, the prospective buyer has a right to know that the structure will be susceptible to flooding and its occupants subject to risk. From a financial standpoint, the prospective buyer has the right to know that the structure and its contents will be susceptible to damage. All prospective owners of these structures who desire flood insurance should be made aware, before closing, that the premium rates applied to these structures can be extreme, and possibly prohibitively high.

Often the variance applicant does not wish, or is not forced under the mandatory purchase requirement, to purchase flood insurance at the time the variance is granted and high rates are not a problem. However, at some later date, especially after a structure has experienced flooding, there may be a desire by the owner to purchase flood insurance. In addition, prospective buyers of a structure for which a variance has been granted may desire or be required to purchase flood insurance and may be discouraged from acquiring the structure because of the high rates. This situation can be compounded when an unsuspecting buyer purchases such a structure and discovers at a later date that insurance is required, but at a prohibitive cost. This can result in an economic hardship to an innocent party.

Functionally Dependent Uses – §60.6 (a) (7)

> "Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that (i) the criteria of paragraphs (a)(1) through (a)(4) of this [60.6] section are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety."

As defined §59.1, a "functionally dependent use" means a use that cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities that are necessary for the loading and unloading of cargo and passengers, and shipbuilding and repair facilities, but does not include the long-term storage or related manufactured facilities.

Long-term storage or related manufactured facilities can be located outside of the floodplain or fully comply with all NFIP requirements. These uses are therefore excluded from the definition of "functionally dependent use". The intent of this is to limit variances only to the practical problems of building and repairing ships, of loading cargo and passengers from vessels, and moving the cargo onto other forms of transportation or to long-term storage facilities that fully comply with NFIP criteria.

In accordance with §60.6(a)(7), communities may grant variances for new construction or substantial improvement and for other development necessary for the conduct of functionally dependent uses. However, all variance criteria must be met and the structures or other development must be protected by methods which minimize flood damages during the base flood.

When applied to some functionally dependent uses such as port facilities, the seafood industry or shipbuilding, NFIP floodplain management criteria can usually be met, with the industry still being able to operate as intended. A 1983 FEMA study entitled *"Effect of Floodplain Regulations on Inland Port Facilities"* identified few instances where ports could not be built in compliance with the regulations while several examples were given of ports that have met all standards.

However, because functionally dependent uses must be located on or adjacent to water to operate, there can be serious practical and operational difficulties resulting in exceptional hardship due to the physical characteristics of the property if a variance is not granted. Typically of concern to the port industry are the elevation and watertight floodproofing requirements in §60.3(d)(3). In addition, problems occasionally arise in dealing with various V-zone requirements in §60.3(e), especially those covering pile and column construction, breakaway walls, prohibition of fill for structural support, and location of new construction landward of mean high tide. Except for the floodway requirements, there feasible alternative methods for creating no additional threats to public safety and achieving a comparable degree of protection from flood damages for the types of structures that normally accompany functionally dependent uses. Therefore, in accordance with §60.6(a)(4), a variance can be used to address the unique problems of functionally dependent uses if it is for "the minimum necessary to afford relief considering the flood hazard" (§60.6(a)(4)).

When evaluating variances for functionally dependent uses, the primary concerns should be that flood damages will be minimized during the base flood and that no additional threats to public safety will be created. A community that varies individual standards for functionally dependent uses, but still uses methods to reduce flood damages to the maximum extent possible or practically feasible does not jeopardize its NFIP eligibility.

As with existing variance criteria under §60.3(a)(1), no variances for functionally dependent uses may be issued within any designated regulatory floodway if any increases in flood levels would increase potential flood damages to other property owners. In may situations there will be feasible locations outside of the floodway for a functionally dependent use. In a functionally dependent use has no option but to locate in a floodway, the applicant must either demonstrate that no increase in flood stages will result or must provide additional floodway carrying capacity such as through channel improvements to ensure that no increase in flood stage will result. Communities should be instructed to contact FEMA regional offices for technical assistance if they encounter situations where functionally dependent uses must locate in a floodway, but cannot meet the no-increase-in-flood stage requirement.

Historic Structures – §60.6(a)

> "Variances may be issued for the repair or rehabilitation of historic structures upon a determination that (i) the proposed repair or rehabilitation will not

preclude the structure's continued designation as a historic structure and (ii) the variance is the minimum necessary to preserve the historic character and design of the structure."

The original intent of providing special treatment to historic structures was to comply with the intent of the Historic Preservation Act of 1966 by 1) allowing historic structures to always maintain Pre-FIRM, subsidized insurance rates and, 2) minimizing the adverse impacts of NFIP requirements on the historic integrity of historic structures. However, it is stipulated under §60.6(a) that the variance be the minimum deviation necessary to preserve both the historic character of the structure and its designation as a historic building. It should be noted that communities that do not require historic structures to meet variance criteria may exempt historic structures through the substantial improvement requirement without requiring the minimum necessary to afford relief provision.

The granting of a variance should be based on a structure-by-structure review to determine whether elevation (or floodproofing if a non-residential structure is involved) to or above the BFE would destroy the historic character or design of the structure. If so, a variance for that structure may be granted. Variances should never be granted for portions of, or entire historic districts, but only for individual historic structures.

For example, if elevation of a historic structure would destroy its character and cause a loss of its Department of Interior (DOI) designation, a variance for the elevation requirement may be considered. However, the owner of the structure should still be required, in accordance with §60.6(a)(40, to do the following where feasible: 1) elevate all utilities and finished interior and exterior improvements wherever possible; and/or 3) raise the interior floors to or above the BFE or to the maximum extent possible (this is often technically feasible in older structures with high ceilings).

Physical alterations made to a "historic structure" which would otherwise constitute a substantial improvement must not result in the delisting of the structure from its DOI certified, state, or local inventory status. If such alterations cause the structure to lose its official listing or historic status, the structure would no longer be a "historic structure" for the purposes of the NFIP and would be considered a substantial improvement and therefore, comply with the NFIP requirements for new construction.

For further background on the pertinent regulations, procedures and adopted nomenclature of the DOI as the as they pertain to historic structures see **36 CFR 61.4, 61.5, 67.2, 67.4, 67.5,** and **67.10**.

APPENDIX F:

Bibliography

Appendix F: Bibliography

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