Floodplain Management for Georgetown Township
February 2005

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Introduction

Flooding is a natural process that occurs wherever there is a body of water. Flooding can cause damage to health, life and property, and can result in personal costs in destruction as well as costs to local, state and federal government. Consequently, federal, state and local governments have passed regulatory laws dealing with floodplains of rivers, stream and drains and construction within a floodplain. The three levels of government work together in the enforcement of these regulatory laws. The following will be explored in greater detail: what constitutes a floodplain, what in entailed in floodplain management, the purpose and history relating to floodplain management, who has authority to regulate floodplains and where does regulatory authority originate, and floodplain regulations and how are they enforced.

The purpose of this study is to compile pertinent information regarding floodplain management and to determine what role and responsibility Georgetown Charter Township has in regards to floodplain management.

What is a Floodplain?

A floodplain is the land adjacent to a river, stream, lake or drain that occasionally becomes inundated by water when such body of water overflows its banks. The term, both in Michigan and nationally, means the land area that will be inundated by the overflow of water resulting from a 100-year flood, which is a flood that has a 1% chance of occurring in any given year. In Michigan about 6% of the land is floodprone and about 200,000 buildings are located in the floodplain. Since flooding is a natural process that occurs wherever there is a body of water, the damage that can result from a flood is related to the development that has occurred in and near the floodplain.

Two distinct and different parts make up a floodplain, the floodway that carries most of the flow during a flood event and the floodway fringe that is the area of slow moving water. The channel of a river or stream and those areas adjoining the channel are the floodways and are required to carry the 100-year flood. These areas contain rapidly moving water during a flood.

What is Floodplain Management?

Floodplain management is the enforcement of national, state and local laws, ordinances and codes including corrective and preventative measures for reducing flood damage to life, health and property. The operation of a community program takes a variety of forms relating to new construction and changes to existing structures including zoning ordinances, subdivision ordinances, building code requirements and special floodplain ordinances which are designed to meet the state and federal requirements as well.

With the passage of the National Flood Insurance Act of 1968, the federal government has established the National Flood Insurance Program (NFIP) which enables property owners in participating communities to purchase insurance to protect against damages resulting from flood

losses. To be eligible to participate in this program, the State and community must agree to practice floodplain management in compliance with all federal, state and local regulations that have been adopted to protect against and reduce flood damage. This insurance then can be purchased by home and business owners and provides an alternative to disaster assistance to reduce the costs of damage to buildings and contents by flooding. Currently, over 20,000 communities participate in this program.

To encourage communities to establish management programs that have more strict and comprehensive requirements and activities than are mandated by NFIP, the Community Rating System was created as an incentive program which results in discounted flood insurance premium rates. The reduced flood risks are achieved by the community action if the three following goals are met: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance.

What is the Purpose of Floodplain Management?

If a residential structure is built in a floodplain with its lowest floor (including basement) below the base flood (100-year) flood elevation, there is a 26% chance of it being flooded before the average 30-year mortgage is paid off. The same structure stands only a 1% change of having a fire in 30 years. Therefore, the structure is 26 time more likely to be damaged by flood than fire. Therefore, to reduce the risk of damage to health, life and property from flooding, communities participate in floodplain management.

The purpose of floodplain management is to assure that no residential construction takes place in the floodway portion of the floodplain to allow the carrying capacity of a watercourse to remain unobstructed. The purpose is also to be certain that all areas of floodplains are clear to reduce the chance of damage to adjacent property owners and to structures. In addition, according to law, no human habitations are allowed in the floodway because it is an extremely hazardous location.

What is the History of Floodplain Management?

National History:
Before the federal government created the NFIP National Flood Insurance Program, there were no established floodplain management practices and only a small number of communities actually regulated activities in the floodplain.

General History:

1967 Floodplain Regulatory Act – protection of people and property
1968 Flood Insurance Act – Flood Insurance becomes available
1994 Flood Insurance Reform Act

Congressional Act of 1803 was the beginning of legislature dealing with disasters such as hurricanes, earthquakes, and other natural disasters. In the 1930's the Flood Control Act was

passed and gave the U.S. Army Corps of Engineers more authority to implement flood control measures. The National Flood Insurance Act was passed in 1968 and offered flood protection to homeowners and in 1974 the Disaster Relief Act was passed. In 1979 President Carter issued an executive order to merge the many separate disaster-related responsibilities to the newly established Federal Emergency Management Agency. In 2001, the agency began coordinating its activities with the newly formed Office of Homeland Security and in March of 2003 the Federal Emergency Management Agency became a part of the new Department of Homeland Security instead of being an independent agency. Its responsibilities include responding, planning and recovering from disasters. The headquarters is in Washington D.C. and regional offices are located across the county.

State History:
Executive Order No. 1995-18 created the MDEQ (Michigan Department of Environmental Quality) and transferred regulatory programs relating to the environment from the Department of Natural Resources to the DEQ. The following executive orders also transferred related responsibilities: Executive Order No. 1996-1 relating to drinking water and radiological protection; Executive Order No. 1996-2 relating to the Low Level radioactive Waste Authority; Executive Order No. 1997-2 relating to storage tanks and dry cleaning establishment; Executive Order No. 1997-3 relating to a science board and the Environmental Administration Division; 1999-10 relating to water quality monitoring and control.

Where does the Regulatory Authority Come From?

The regulatory authority for enforcing floodplain management practices is now a partnership with FEMA (Federal Emergency Management Association), State (Michigan Department of Environmental Quality) and the local government municipality.

The Floodplain Regulatory Act, found in Part 31, Water Resources Protection of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended, requires that prior to any construction or occupation in the 100-year floodplain of a river, stream or drain a permit be obtained from the State. The Land and Water Management Division is a department of the Michigan Department of Environmental Quality and is charged with the responsibility to ensure that any development in the 100-year floodplain is safe and would not potential increase any flood damage. **These DEQ permits are required for any new construction or any additions to construction, as well as for a filling, grading or any occupation of the 100-year floodplain. Other encroachments, such as grading, pools, fences, garages, sheds and other accessory structure require a permit.**

Additional state regulations apply to floodplain management including:

1. Part 313, Wetlands Protection and Part 301, Inland Lakes and Streams,
2. Mobile Home Commission Act, PA 96 of 1987 as amended, which governs mobile home setup. This also prohibits placement of mobile homes in floodway portions of floodplains and requires anchoring of any mobile homes placed in floodplains.
3. The Land Division Act, 1967 PA 288, as amended, regulates the subdivision of land in Michigan and requires that the floodplain limits be defined and prescribes minimum

standards for new development for residential purposes and occupancy, within or affected by a floodplain.

4. The Michigan Building Code (2003 Michigan Residential Code): R560.304. Building in areas affected by floodplains.
5. The Condominium Act, 1979 PA 59, as amended, requires that the floodplain limits be identified and restricts certain structures in floodplain areas. It is also identified in the 2003 Michigan Residential Code, Section 323 and Section 1612.
6. Section 10 of the Federal Rivers and Harbor Act of 1899 (33 U.S.C. 403).
7. Section 404 of the Federal clean Water Act of 1972 (33 U.S.C. 1344)

What are the Floodplain Regulations?

The minimum standard for residential construction within the 100-year floodplain requires that the lowest floor of a structure be elevated a minimum of one-foot above the 100-year flood elevation, although local communities may require a higher standard relating to elevation requirements. A basement is below grade on all sides and must be a minimum of one foot above the 100-year flood elevation.

The floodplain permitting review and issuance is done by the MDEQ and the following are activities that require state (and may require) local permits:

- constructing new buildings
- additions to buildings
- placing manufactured (mobile) homes
- temporary buildings and accessory structures
- agricultural buildings
- temporary or permanent materials storage, including gas/liquid tanks and sand/gravel
- roads, bridges and culverts
- fill, grading, excavating, mining and dredging
- altering stream channels

In order for a community to participate in the NFIP, local regulations must be in force to:

1. Require that new construction and substantial improvements in flood prone areas be designed and adequately anchored to prevent floatation, collapse or lateral movement, be constructed with materials and utility equipment resistant to flood damage, and be constructed y methods and practices that minimize flood damage.
2. Require, where flood elevation data are available, that all new construction and substantial improvement of residential structures located in mapped floodplain areas have the lowest floor (including basement) elevated to a minimum of one foot above the 100-year flood level; and all new construction and substantial improvements of nonresidential structures in flood hazard areas have the lowest floor (including basement) elevation or floodproofed to a minimum of one foot above the 100-year flood level. Floodproofing must be certified by a register professional engineer or architect.
3. Require anchoring of mobile homes in flood prone areas.
4. Maintain a record of all lowest floor elevations or the elevations to which buildings have been floodproofed when the building is located in a mapped flood hazard area.

5. **Floodplain requirements apply to all land below the 100-year floodplain elevation regardless of shading on map**.

If a community fails to enforce these minimum standards, the loss of all flood insurance, federal grants and loans in flood prone areas and federal disaster assistance could be lost and could also result in the loss of all federally insured, regulated, or supervised mortgages in the community.

How are Floodplain Regulations Enforced?

Initially, the determination must be made if construction or substantial improvements to an existing structure are planned to take place within a floodplain. The Flood Insurance Rate Map is designed specifically for flood insurance and floodplain management applications and can be used to make this determination. For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations. The Flood Insurance Rate Maps (FIRMs) and **Flood Insurance Study** (can be used for more specific review-cross sections are listed in table, in between cross sections at the back, flood profiles are shown with the side view of the river) are developed by the Federal Emergency Management Agency (FEMA). FEMA is also in the process of developing digital flood insurance rate maps (DFIRM).

In addition, an Elevation Survey could be obtained to determine the elevation of the land to compare the elevation to the number listed on the FIRM. If construction is to take place in the floodplain, the Elevation Survey IS REQUIRED. If questions, contact the DEQ.

In Michigan, the State Construction Code Act requires that every community be subject to the State Construction Code which specifies building code standards for flood-resistant construction for buildings and for mobile-home setup, which must be used in floodplains. The communities enforcing the 2003 Michigan Building Code and the 2003 Michigan Residential Code have the authority and responsibility to require flood resistant construction according to the Code. Therefore, since the construction codes have requirements and standards for construction in a floodplain, all Michigan communities have floodplain construction regulations. Manufactured home setup is also restricted by the flood related provisions of the State Mobile Home Commission Act of 1987, PA 96, as amended, and the State Construction Code. Additional building requirements could be specified for subdivision developments, condominium developments, or by a specific community ordinance.

In addition, **permits from the MDEQ are required for all construction and filling in SFHA (Special Flood Hazard Areas)/floodplain areas**. The local community must maintain records of floodplain construction and activities including:

1. As-built Elevation Certificate for all new or substantially improved structures within the 100-year floodplain
2. Copy of DEQ permit

Section 59.1 Definitions of the NFIP Regulations state:

"Substantial improvement means any repair, reconstruction, rehabilitation, addition, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. The term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. The term does not however include either: (1) 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 by the local code enforcement official and which are the minimum necessary to assure safe living conditions or (2) Any alteration of a "historic structure, provided that the alteration will not preclude the structure's continued designation as a "historic structure." "

What Areas are Regulated?

Communities participating in the NFIP must regulate all new developments and substantial improvements located in flood hazard areas.

The Floodplain Regulatory Authority deals with the floodplains of rivers, streams, or drains which have a drainage area that is 2 square miles or greater. A permit is not required from the MDEQ, under Part 31, for alterations within the floodplains of the Great Lakes, inland lakes without an inlet or outlet, or watercourses which have a drainage area less than 2 square miles. However, reviews may still be necessary under other State statutes found in NREPA such as:

Part 301 (Inland Lakes and Streams)
Part 303 (Wetlands Protection)
Part 315 (Dam Safety)
Part 323 (Shorelands Protection and Management)
Part 325 (Great Lakes Submerged Lands)
Part 353 (Sand dune Protection and Management)
Part 91 (Soil Erosion and Sedimentation Control)

In general, construction and fill may be permitted in the portions of the floodplain that are not floodway, if local ordinance and building standards are met, and compensating excavation is provided equal to the volume of fill placed in the floodplain. New residential construction is specifically prohibited in the floodway. State and local ordinances must be met.

Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Community participation in the NFIP is voluntary. Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage is reduced by nearly $1 billion a year through communities implementing sound floodplain management requirements and property owners purchasing of flood insurance.

Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance. And, every $3 paid in flood insurance claims saves $1 in disaster assistance payments.
In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance. The National Flood Insurance Program, Program Description offers a more detailed overview and history of the program.

Floodplain Management for Georgetown Township

Michigan law required a Part 31 floodplain permit from the MDEQ for the occupation of riverine floodplains. If such an occupation is proposed in Georgetown Township, no building permit would be issued until a MDEQ Part 31 floodplain permit or letter of no authority is submitted to the Township.

Any occupation, filling, grading within the 100-year floodplain requires a permit from the Geological and Land Management Division (GLMD) under the State's Floodplain Regulatory Authority found in part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

Construction and fill may be permitted in portions of the floodplain that are not floodway, provided local ordinances and building code requirements are met. Floodways are the channel of the stream or drain and those portions of the floodplain adjoining the channel that are reasonably required to carry and discharge the 100-year flood. These are generally the areas of moving water during a flood. Residential construction is prohibited in the floodway portion of the floodplain. Other types of commercial construction and other non-inhabited occupation of the floodway may be allowed; however, an engineer analysis may be required which demonstrates that flood flow will not be restricted.

The MI Residential Building Code requires that the lowest floor be elevated at least one foot above the design flood level. Basement floors that are below grade on all four sides shall be elevated to a minimum of one foot above the design flood level (normally the 100-year elevation). Non-residential structures may be elevated or dry floodproofed. Enclosed space below the 100-year floodplain elevation, such as a crawl space, must be designed to automatically equalize hydrostatic forces on exterior walls.

The common technique used is to require that the lowest floor, including basement, be elevated to a minimum of one foot above the flood elevation. In practical terms, this requirement precludes basement construction in floodplain areas unless a Letter of Map Revision is obtained.

When a building permit application is received by the Township, the following are the required procedures:

1. Determine if project is in a flood hazard area by using the Flood Insurance Rate Map (FIRM), FIF, Flood Insurance Study, elevation of the site and/or review either the plat map or approved site plan for floodplain information (**base on elevation**).
2. If there is a question as to whether the project is located in the floodplain, an Elevation Survey is required which would provide the ground elevation at the building site to compare with the 100-year elevation from the Flood-Insurance Rate Map (FIRM). If the land was recently filled, a MDEQ floodplain permit should be available on site or in the owner's possession.
3. If the project is NOT located within the floodplain **by virtue of elevation**, the application proceeds along regular established procedures.
4. If the project IS located within the floodplain, an Elevation Survey is required and a MDEQ permit is required prior to the application proceeding along regular established procedures. In addition, the applicant shall submit a site plan showing property lines, proposed construction, existing ground elevations, and the 100-year flood elevation. The plan shall be prepared by, and bear the original signature and seal of a land surveyor, engineer, or architect authorized by law to certify elevation information.
5. If the project is located within a floodplain, PCI reviews the permit application to ensure that the structure meets local floodplain requirements and all necessary precautions are being taken to minimize flood damage;
6. After issuing a permit, PCI makes an inspection before any filling or placement of obstruction is done, upon placement of the lowest floor (see R 109.1.3 of the 2003 Michigan Residential Code), and make a final inspection when the project is completed;
7. PCI verifies that the new or substantially improved structure permitted in the flood hazard area has been elevated or floodproofed to a minimum of one foot above the base flood elevation (**this is accomplished by the submission of a as-built elevation certificate**);
8. When floodproofing for non-residential buildings is used, a certification from a registered professional engineer or architect is required from the owner to verify that the floodproofing method is designed to meet State Construction Code or community ordinance standards before issuing the building permit.
9. The actual elevation would be recorded in the building permit file stipulating the lowest floor (including basement) or the elevation to which the structure was floodproofed in relation to mean sea level (National Geodetic Vertical Datum),;
10. The Township maintains a record of all variances granted;
11. Applicants for variances are to be notified in writing that issuances of a variance to construct a structure below the base flood elevation will result in a dramatic increase in insurance rates and added threat to life. A copy of this notification should be retained in the official records.

The DEQ would have the jurisdiction over a drainage area if the drainage area is 2 square miles or greater, under the Land and Water Management Division (LWMD) under the State's Floodplain Regulatory Authority found in Part 31, Water Resources Protection of Natural Resources and Environmental Protection Act, 1995 PA 451, as amended (NREPA). If the area is near a drainage area, but the area is less than 2 square miles, the DEQ will issue a "No

Authority" letter. **This still could be floodplain and any construction would have to meet the building code and would have to be at least one foot above the base flood elevation, although no MDEQ permit would be required.**

The plan is to let the floodplain do its job and keep an area in the floodplain as natural as possible with low damage uses such as recreational areas, playgrounds, reforestation, parking, gardens, pasture, or created wetlands

If the natural or unfilled land is shown on the map as in the floodplain, but the natural ground of the building site is higher than the BFE, a surveyor, engineer or architect who is authorized to certify elevations to could complete a FEMA Elevation Certificate and submit it with application to FEMA requesting a letter of Map Amendment. This is the only way to remove the requirement to buy flood insurance.

Floodplains are found in Georgetown Township along the Grand River, Rush Creek, the Lowing-Comstock Drain (main and tributaries), Bliss Drain, Watson Drain and Huizenga Drain.

In summary, if the site plan details show that the parcel is within a regulated area, then the applicant is notified that the following should be obtained:

- A permit from the DEQ to build in a riverine floodplain,
- Have a Registered Professional establish an on-site bench mark,
- Stake the property lines and the boundaries of the proposed structure, and give the building inspector a 24-hour notice that the site is ready for inspection.
- The building inspectors visits the site and determines whether the structure is located according to the submitted plan and if the bench mark has been set. If everything is in compliance, proceed to regular procedures.

Elevation requirements

1. Require all buildings constructed in the floodplain to complete elevation certificate
2. Commercial structures-new construction and additions are elevated or floodproofed to a minimum of 1 foot above BFE. Floodproofing must be certified by an engineer.
3. Residential structures-new construction and additions located in floodplain areas have the lowest floor (including basement) elevated a minimum of 1 foot above BFE
4. Mobile homes must be anchored to prevent floatation
5. Critical facilities (hospitals, fire and police departments, wastewater treatment plants) new construction and additions a minimum of 1 foot above 500-year floodplain for critical facilities.
6. Flood venting of all enclosed spaced below BFE (i.e. crawl spaces) 1 square inch of opening for every square foot of enclosed space. Opening bottom should be a maximum of 1 foot above finished exterior grade.
7. Substantial improvements includes any reconstruction, 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 improvement[1[1]]. Requirement for substantial improvements-the entire structure (along with the addition) must be elevated.

[1[1]] Michigan Residential Code R 105.3.1.1 and R112.2.1

Definitions

The following are definitions in the "Flood Insurance Study for Charter Township of Georgetown, Michigan, Ottawa County, dated February 5, 1992, by Federal Emergency Management Agency.

100-year flood plain (base flood) - the flood that has a 1-percent probability of being equaled or exceeded in any given year

500-year flood plain - 0.2-percent annual chance of flood

BFE – Base Flood Elevation-elevation to which the floodwaters rise during the flood which has a 1% chance of occurring each year (100-year flood)

CRS – Community Rating System

Elevation Certificate (EC) is a FEMA form, when floodplain has BFE, the EC must be signed and sealed by a land surveyor, engineer, or architect authorize by law to certify elevation information. A community official may complete the EC for sites in AO zones and A zones without BFEs. It can be used to show that sites are natural ground above the base flood elevation. It is used to verify that buildings are elevated properly. Insurance agents use to write flood insurance policies. (or is a document completed by a licensed professional engineer, surveyor or architect certifying the "as-built" elevation of the lowest floor including basement of a structure built in a floodplain.

FEMA-Federal Emergency Management Agency – federal agency primarily responsible for disaster preparedness, mitigation, response and recovery and the administration of the National Flood Insurance Program (NFIP).

FIA Federal Insurance Administration –component of FEMA directly responsible for administering the flood insurance aspects of the NFIP

FIRM – Flood Insurance Rate Map

flood – a general and temporary condition of partial or complete inundation of normally dry land areas from (a) the overflow of inland or tidal waters, (b) the unusual and rapid accumulation of runoff of surface waters from any source, or (c) the collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water leveling a natural body of water, accompanied by a severe storm or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge or by some similarly unusual and unforeseeable event which results in flooding.

floodplain is that area of land adjoining a lake or watercourse which will be inundated by a flood.

floodplain management is an overall program of preventive and corrective measures within floodplain areas to enhance the quality of life and protect health, safety and welfare.

floodplain regulations includes zoning ordinances, subdivision regulations, building codes, health regulations, special-purpose ordinance, and/or other applications of police power to control the occupation or alteration of floodplains.

floodplain regulatory authority is found in Part 31, Water Resources Protection, of the Natural Resources Environmental Protection Act, 1994 PA 451, as amended and is the state law which authorizes the Michigan Department of Environmental Quality to regulate riverine and inland lake floodplains.

floodway is a channel of a river or other watercourse plus any adjacent floodplain areas that must be kept free of encroachment so that the 100 year flood can be carried without substantial increases in flood height, the area of the floodplain where floodwaters usually flow faster and deeper.

floodway fringe – the area between the floodway and the 100 year floodplain boundaries, encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100 year flood by more than the state's allowable surcharge at any point.

flood profiles - determine the BFE at specific site.

harmful interference means causing an increase water level, an increased velocity or a change in the direction of flow of a water course which causes, or is likely to cause, damage to property, a threat to life, a threat of personal injury, or pollution, impairment or destruction of water and other natural resources.

LOMA is an official amendment to an effective FIRM that may be issued when a property owner provides additional technical information, such as ground elevation relative to the BFE, SFHA and the building.

LOMR is an official revision to an effective FIRM that may be issued to change flood insurance risk zones, floodplain and floodway boundary delineations, BFEs and and/or other map features.

LOMR-F is an official revision to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated by fill above the BFE and is therefore no longer in the SFHA.

LOMR PMR is a Physical Map Revision and may be issued for major physical floodplain changes that require engineering analyses, such as bridges, culvers, etc. and large fills that change the BFE or floodway. They are also issued when a new study updates or improves the FIRM.

Lowest floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure (that is not a basement) is not the lowest floor if the enclosure is built as required in the local ordinance, which includes limited uses.

MDEQ – Michigan Department of Environmental Quality

NFIP National Flood Insurance Program

SFHA - Special Flood Hazard Area, area of the floodplain subject to inundation by the base flood and/or flood-related erosion hazards.

Flood Insurance Zone Designations

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses.

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone. High-risk area.

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed Flood Insurance Study are shown at selected intervals within this zone. High-risk area.

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than one foot, areas of 100-yar flooding where the contributing drainage area is less than one square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone. Low risk areas affected by the 500-year floodplain.

Zone C is all other areas, considered to be low-risk

Zone B is subject to flooding by the 500-year flood and is a moderate risk area

For floodplain insurance issues, if a map is not accurate enough to show whether the property is in or out of the mapped floodplain there are three options for the person needing the information:

1. Contact a floodplain determination company (online at www.fema.gov/nfip/fzon1)
2. Hire a licensed professional engineer to survey the property to determine if the site is in or out of the floodplain.
3. Contact the FEMA's contractor, Baker Corporation at 703-317-6532 and request a floodplain determination.

Miscellaneous Information

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount (a Class 10 is not participating in the CRS and receives no discount). The CRS classes for local communities are based on 18 creditable activities, organized under four categories: (i) Public Information, (ii) Mapping and Regulations, (iii) Flood Damage Reduction, and (iv) Flood Preparedness.
Various construction techniques are used to insure that structures are resistant to flood damage, including the NFIP and State Construction Code.

1. Elevation of structures on fill, raised foundation or piers can protect buildings from flood damages. The NFIP requires that lowest floor (including basements) of residential structures located in the 100 year floodplain to be elevated to a minimum of one foot above the 100-year flood level. Nonresidential structures are also required to be elevated or floodproofed a minimum of one foot above the 100-year flood level. The State Construction Code is more restrictive in that it requires the surface of the lowest floor to be a minimum of one foot above the 100-year flood level at a minimum.
2. Structural floodproofing is acceptable under the NFIP and the 2003 Michigan Building Code for non-residential structures.

Accessory structures are on the same lot and incidental to the principal structure. FEMA waived the elevation requirement for accessory structures due to the cost of elevating or floodproofing these structures. However, the following conditions must be met:

1. The building must be equipped with permanent openings to automatically allow the entry and exit of floodwaters in order to equalize hydrostatic pressure;
2. The building must not be intended for human habitation;
3. The building must be designed to have a low flood damage potential;
4. The structure must offer minimum resistance to the flow of floodwater by location and design;
5. The structure must be anchored;
6. Any electrical or mechanical services must be elevated a minimum of one foot above the base flood elevation or be floodproofed;
7. The building should represent a minimal investment (in Michigan the value should be less than $5,000).

Note: The 2003 Michigan Residential Code specifically exempts accessory structures under 200 square feet from the requirement of a building permit; however, the structure must conform to applicable Code provisions. If an accessory structure is 120 square feet or less located in the floodplain no MDEQ permit is required.
Community participation in the NFIP is based upon a mutual agreement between the federal government (FEMA) and the identified floodprone communities. In return for the local adoption and enforcement of floodplain management regulations that meet the minimum criteria of the NFIP, the FEMA provides the availability of flood insurance coverage within that community. Participating communities in which the local floodplain management regulations meet the minimum criteria of the NFIP are responsible for administering and enforcing their local

floodplain management requirements pursuant to their own authority and through their own procedures. However, the FEMA periodically evaluated the administration and enforcement of local floodplain management programs in relation to the NFIP Regulations and has the authority to impose sanctions against those communities whose overall floodplain management programs are found to be inadequately administered or enforced.
Floodplain fill can make floods worse. Floodplains are supposed to store floodwater. If storage space is lost due to fill, future flooding may be worsened. MDEQ may require an analysis to show how floodplain fill will alter flooding.

A crawl space is one way to elevate just a couple of feet. Best flood protection and drainage, the interior ground surface should be the same as the outside ground level along at least one side.

Variance Criteria

Variance – good and sufficient cause, unique site conditions, individual non-economic hardship, if in the floodway, the project causes no increase in flood levels (still need expensive flood insurance)

The NFIP variance criteria are based on the general principle of zoning laws that variance pertain to a piece of property and are not personal in nature. A property 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. These characteristics must be unique to that property and not be shared by adjacent parcels. The unique characteristic 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 is never sufficient cause for granting a variance. Granting a variance from the NFIP floodplain management standards for grounds such as person criteria and the character of the owner rather than the nature of the property would rarely be an appropriate action because it would not be consistent with the community's need to ensure public safety. Once the property is sold, the justification for the variance based on personal considerations no longer exists and 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. Variance criteria is listed in Sec. 60.6(a) of the NFIP Regulations and must be read as a whole, not piecemeal. Variances can be granted for new construction and substantial improvements only if all the criteria in Section 60.6(a) and the local ordinance are met.

Mitigation

The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.

Mitigation is the cornerstone of emergency management. It's the ongoing effort to lessen the impact disasters have on people's lives and property through damage prevention and flood insurance. Through measures such as, building safely within the floodplain or removing homes altogether; engineering buildings and infrastructures to withstand earthquakes: and creating and enforcing effective building codes to protect property from floods, hurricanes and other natural hazards, the impact on lives and communities is lessened.

The Mitigation Division, a component of the Federal Emergency Management Agency (FEMA), manages the National Flood Insurance Program. The three components of the National Flood Insurance Program (NFIP) are:

Flood Insurance
Floodplain Management
Flood Hazard Mapping

The Mitigation Division at FEMA is the organization responsible for working with communities to encourage them to adopt and enforce ordinances that meet or exceed the minimum floodplain management requirements of National Flood Insurance Program.